The institute formulates the learning objectives of each program during the course beginning. College management, with their faculty members conducts the orientation program. During this orientation program faculty members discuss about the program structure, course content, how the course is scheduled year wise and the evaluation process like examinations, practical procedure.

Assessment process:

Knowledge gained by the student is assessed by various procedures like college conducts classes according to the given schedule and at the end of the class the content delivered to the student is assessed by pre and post-test evaluation.

This is achieved by two processes: Formative evaluation or internal assessment and Summative or University examinations.

1.Formative evaluation is done through a series of tests and examinations conducted periodically by the institution.

2.Summative evaluation is done by the University through examination conducted at the end of the specified course.

Examination scope:

These regulations shall be applicable for the BDS degree examinations conducted by various universities in the country. A preface evaluation is a continuous process which is based upon criteria developed by the concerned authorities with certain objectives to assess the performance of the learner. This also indirectly helps in measurement of effectiveness and quality of the concerned BDS program.

Evaluation is achieved by two processes- Formative or internal assessment and Summative or university examinations

Formative assessment is done through a series of test and examination conducted periodically by the institution and Summative is done by the University through examination conducted at the end of the specified course.

Methods of evaluation:

Return test, Practical Examination, viva, internal assessment examination.

The continuous assessment examination may be held frequently at least three times in the particular year and the average marks of these examinations should be considered. 10% of the total marks in each subject for both theory and practical and clinical examination separately should be set aside for the internal assessment examination.

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Scheme of examination:

The scheme of examination for BDS course shall be divided into first BDS examination at the end of the First academic year, Second BDS examination at the end of second year, Third BDS examination at the end of third and Final BDS.

The examination shall be open to a candidate who satisfies the requirements of attendance progress and other rules laid down by the University.

FIRST BDS EXAMINATION

1.General anatomy, Embryology and Histology

2. General Human Physiology and biochemistry

3. Dental Anatomy, Embryology and Oral Histology.

SECOND BDS EXAMINATION

A candidate who has successfully completed the First BDS examination can appear for second BDS examination.

1.General pathology and Microbiology

2.General and Dental Pharmacology and therapeutics

3.Dental materials

4.Preclinical Conservative

5.Preclinical Prosthodontics

THIRD BDS EXAMINATION

A candidate who has successfully completed the Second BDS examination can appear for third BDS examination.

1.General medicine

2.General surgery

3.Oral pathology and Microbiology

FOURTH BDS EXAMINATION

A candidate who has successfully completed the Third BDS examination can appear for Final BDS examination.

1.Public Health dentistry

2.Periodontology

3.Orthodontics and Dentofacial Orthopedics

4.Oral medicine and Radiology

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5.Oral and Maxillofacial surgery

6.Conservative dentistry and Endodontics

7.Prosthodontics, Crown and Bridge

8.Pediatrics and preventive dentistry.

- Evaluation should be made both objective and structural. The method of objective structured clinical examination should be followed. This will avoid examiner bias because both the examiner and the examinee are given specific instructions on what is to be observed at each stage.
- The candidate should be given credit for his/her records based on the score obtained in the record scheme of Clinical and Practical Examination.
- Marks allotted for each had to be discussed and finalized by the Chairman and other examiners and it is to be published prior to the conduct of the examinations along with the publication of the time table for the Practical Examination.
- Each Candidate should be evaluated by each examiner independently and mass computed at the end of the examination. This is an excellent mode of assessment because, it permits a fairly broad coverage and it can assess the problem-solving capacity of the student and assessment related to the effective domain is also possible through it.
- Criteria for a pass is 50% of the total marks in any subject computed as aggregate. Any candidate who fails in one subject in an examination is permitted to go to the next higher class and appears for the set field subject and completed successfully before he is permitted to appear for the next higher examination.

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2.6.1c

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DEPARTMENT OF PUBLIC HEALTH DENTISTRY
CLINICAL AND FIELD PROGRAMME
RECORD BOOK

NAME Bolla Manisha

ROLL 170210609.0

YEAR : IV YEAR (2023-2024)

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SVS INSTITUTE OF DENTAL SCIENCES
MAHABUBNAGAR

University Reg. No 1902106020

DEPARTMENT OF PUBLIC HEALTH DENTISTRY
CLINICAL AND FIELD PROGRAMME RECORD BOOK

20 22 to 20 24

NAME : Bolla Manisha

ROLL NO : 1902106020

YEAR : 2023-2024

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MAHABUBNAGAR

SVS INSTITUTE OF DENTAL SCIENCES
MAHABUBNAGAR

CERTIFICATE

Certified that this is a Bonafide Record work done by Mr. /Miss/Mrs. .....
Bolla Manisha ..... with the university Roll Number 1909106020
in the Department of Public Health Dentistry in the year 20.23. - 20.24.

Department of Public Health Dentistry
SVS Institute of Dental Sciences
Mahabubnagar

Signature of the HOD

Signature of the Examiners

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CASE HISTORY PROFORMA I

Student's Name: B. Manisha

Date: 10/05/2023 OP.No. 2328246

Patient's Name: Kauslaya Age: 36 years Gender: Female

Date and place of Birth: Kondapur

Religion: Hindhu

Education: Illiterate - 1 Occupation: Labour - 2

Total Income of family per month: 25,000 | — 2

Total number of family members: 5

Percapita income: $\frac{25,000}{5} \times 12 = 60,000$

Kuppuswamy Socio Economic status — Upper lower class - IV

Address and Contact Number:

Kondapur, Dharwada (Mdl), Mahabubnagar

7039118336

I. Chief complaint: patient complaining of pain in lt lower left back tooth Region since 1 month.

II. History of present illness: Patient was Apparently Asymptomatic 1 month ago, hata, she developed pain in lower left back tooth region, was gradual in Onset, Intermittent in nature, throbbing type, mild in intensity, no aggravating factors & relieved on medication.

III. Medical History:

— No Relevant medical history as elicited by patient.

IV. Past Dental History:

2nd Visit

1st Visit [Extraction in lower right back tooth region 2 years back]

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V. Family History:

a) Siblings: 9 b) Marital status: Married c) Children (if any) 3

VI. Personal History:

a) Adverse habits:

a. Present habits Thambaku chews b. Past Habits

Number 5-6 Frequency 5-6 Duration 20 years

1. Smoking
2. Smokeless tobacco
   a. Ghutka – Thambaku chews 5-6 times daily since 20 years
   b. Pan with tobacco
3. Pan chewing
4. Alcohol consumption Occasional Alcoholic

b) Habits related to oral cavity:

a. Present	b. Past
1. Mouth Breathing	Present/absent ✓
2. Thumb sucking	Present/absent ✓
3. Tongue thrusting	Present/absent ✓
4. Bruxism	Present/absent ✓
5. Pencil/nail/lip biting	Present/absent ✓

c) Oral Hygiene Practices:

1. Type of cleaning aid: Toothbrush ☑ Finger ☐ Twig ☐ Any other ☐

Duration - 5 minutes

1a. Type of tooth brush Soft / Medium ✓ / Hard

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2. Method of Cleaning: Vertical ☐ Horizontal ☑ Circular ☐

3. Materials Used: Toothpaste ☑ (Colgate (Fluoridated)) Tooth powder ☐ Charcoal ☐

Sand ☐ Brick powder ☐ Any other ☐

4. Frequency of cleaning: Once ☑ Twice ☐ More than twice ☐

5. Time of brushing: Before meals ☑ After meals ☐

6. Frequency of changing the toothbrush: Flaring of bristles (5 months)

Reason

7. Use of other oral hygiene aids:

d) Dietary habits: Mixed

1. Source of water: Bore Water

2. Diet : Vegetarian ☐ Mixed ☑

3. Dietary chart:

Time	Item
8:00 AM	5 Idli with chutney + 1 cup of Tea with 1 spoon of Sugar
12:30 PM	1 Bowl of Rice + with dal
4:00 PM	1 Cup of Tea with 1 spoon of Sugar
8:00 PM	1 Bowl of Rice with dal

Staple Diet: Rice

Sugar Exposure: Twice

Sugar Score = 5 × 2 = 10
Good

4. Sugar consumption (per day)

Type: Liquid Frequency: 2 Time of intake: before & in between meals

Form and consistency: Solid /Liquid/Sticky /Non-sticky

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VII. General Physical Examination

Built: Moduale Built

Posture: Erect

Gait: Normal

Vital Signs *

VIII. Local examination

a) Extra oral

1. Symmetry: No Gross facial Asymmetry noted
2. T.M.J: Bilateral Synchronous with no clicking or popping sounds
3. Lymph nodes: Not palpable
4. Lip competency: Competent

b) Intra oral

1. Soft tissue:

Tongue: No Abnormality detected

Labial mucosa: melanin pigmentation on left Buccal Mucosa

Palate: No Abnormality detected

Floor of mouth: No Abnormality detected

Alveolar mucosa: No Abnormality detected

Lip: Competent

Gingiva: Color: pale pink with melanin pigmentation; Contour: Accunated +/14; Consistency: firm & Resilient; Texture: stippling present; Bleeding on probing: Present Localized 3/5

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2. Hard tissue

Type of dentition: Permanent Dentition

Number of Tooth present: 28

Teeth present: 8 7 6 5 4 3 2 1 | 1 2 3 4 5 6 7 8

8 7 6 5 4 3 2 1 | 1 2 3 4 5 6 7 8

Teeth missing and reason for loss: 16 Extraction done due to caries 8 years back.

Root stumps: Absent

Dental caries: present

Non cavitated (Initial):

Cavitated: class-II Dental Caries ✓

Cavitated (with pulp exposure): present ✓

Secondary Caries: Absent

Filled teeth: Absent

Any prosthesis: Crown Absent

Bridge Absent

RPD\ Implant Absent

Wasting disease: a. Generalized b. Localized ✓

A. Attrition Absent

B. Abrasion 6 3 | 6
5 4 | 4 5

C. Erosion Absent

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Enamel Hypoplasia: Absent

Dental Fluorosis: Absent

Supernumerary teeth: Absent

Any other anomaly please specify: Absent

Malocclusion: Angles class-I molar relation bilaterally (Right side)

Fractured teeth Absent

Dental deposits : stains (intrinsic/extrinsic)

calculus mild

3. Periodontal Status :

Gingival recession : ~~+~~ 1+14 class-I miller

Periodontal pocket : localized / generalized ~~+~~ 67

Mobility of teeth : Grade-II ~~+~~ 67

4. Oral Hygiene Status :

Dental deposits calculus - mild
stains - mild

RUSSELL'S PERIODONTAL INDEX 1956

18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	X
X	0	X	0	0	0	0	0	0	0	0	0	0	8	6	X
48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38

$\frac{23}{28} = 0.8$ → SIMPLE GINGIVITIS

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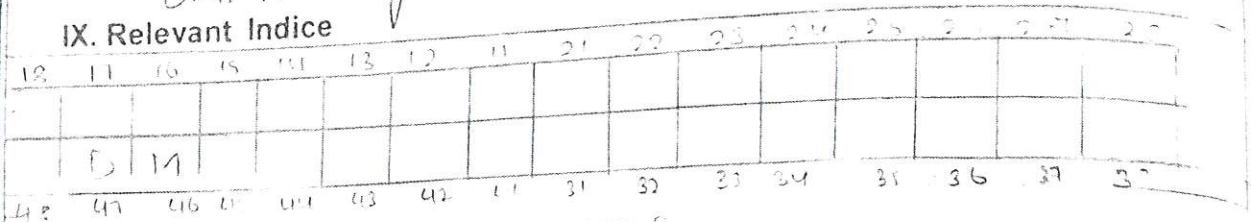
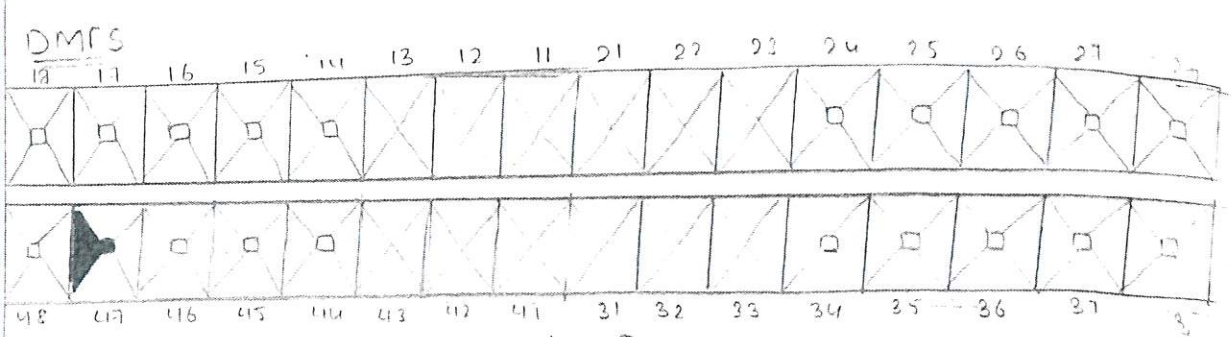
DMFT - Henry T Klein, Carroll E Palmer, J Knutson - 1938

IX. Relevant Indice



DMFT : DT+MT+FT : 1+1+0 : 2

DMFS



DMFS : DS+MS+FS : 3+5+0 : 8

NO OF INTACT SURFACES = 133 - 8 = 125

OHI - JOHN C GREENE & JACK R VERMILLION - 1960

DI = $\frac{6}{6}$ = 1

[16] 1, 0 [16]	[11] 1, 0 [11]	[26] 1, 1 [26]
[47] 0, 0 [47]	[31] 0, 0 [31]	[36] 1, 1 [36]

CI : $\frac{7}{6}$ = 0.8

[16] 1, 1 [16]	[11] 0, 1 [11]	[26] 0, 0 [26]
[47] 0, 0 [47]	[31] 1, 1 [31]	[36] 0, 0 [36]

OH : DI + CI : 1 + 0.8 = 1.8

OHIS - JOHN C GREENE & JACK R VERMILLION - 1964

16	11	26
0	0	1
0	0	1
47	31	36

DI-S → $\frac{2}{6}$ = 0.3 GOOD

16	21	26
1	0	0
0	1	0
47	31	36

CI-S = $\frac{2}{6}$ = 0.3 GOOD

INTERPRETATION : GOOD [0.3+0.3 = 0.6]

COMMUNITY PERIODONTAL INDEX OF TREATMENT NEEDS - WHO 1978

CPI

16	11	26
0	0	0
0	0	4
47	31	36

CPI = 5

16	11	26
TN_0	TN_0	TN_0
TN_0	TN_0	TN_1
47	31	36

Treatment need

TN_0 = 5

TN_1 = 1

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X. Provisional diagnosis: Apical periodontitis 67, Ellis class-I 1, class-II Dental Caries 7, chronic generalized gingivitis with localized periodontitis, Partial Edentulous 6, Dentinal hypersensitivity

XI. Investigation:

IOPA 67

XII. Diagnosis: chronic periApical Abscess 67, class-II Dental Caries 7, Ellis class-I 1, chronic generalized gingivitis localized periodontitis, partial Edentulous 6, Dentin hypersensitivity.

XIII. Treatment Plan:

PRIMARY LEVEL: Advise patient to brush twice daily with soft bristles

- Advised modified stillmann technique, Advise desensitizing paste.
- Advise patient to Visit dentist Every 6 months, Advise to Quit habit of thamakku & Alcohol Consumption, Advise patient to change brush Every 3 month's

SECONDARY LEVEL:

Advise Oral prophylaxis

Advise Restoration 63|16 / 53|45

TERTIARY LEVEL: Advise replacement of missing 6 with Either FPD|RPD|Implant

Advise Extraction of 67 followed by Replacement of missing teeth

Advise Root canal treatment 7 followed by Crown placement.

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CASE HISTORY PROFORMA - II

Student's Name: B. Manisha

Date: 01/06/23 OP.No.

Patient's Name: havanya Age: 48 years Gender: female

Date and place of Birth: Khadhnagar

Religion: Hindhu

Education: 9th class - 4 Occupation: Unemployed - 1

Total Income of family per month: - 30,000/- 2 Kuppuswamy Socioeconomic status

Total number of family members: 4 - 7 [lower class / upper]

Percapita income: $\frac{30,000 \times 12}{4} = 90,000/-$

Address and Contact Number:

Khadhnagar.

9010345106

I. Chief complaint: patient Complaint of pain in her lower right back tooth region since 4 days

II. History of present illness: ——patient was Apparently Asymptomatic 4 days ago, later she developed pain in her lower right back tooth region was gradual (sudden) in Onset, intermittent in nature, moderate in intensity aggravated On intake of hot food & cold & reduced On medication

III. Medical History:

- No relevant medical history as elicited by patient.

IV. Past Dental History:

2nd dental Visit

1st dental Visit (Extraction in lower right back tooth region)

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V. Family History:

a) Siblings: 3 b) Marital status: Married c) Children (if any) 2

VI. Personal History:

a) Adverse habits:

	a. Present habits			b. Past Habits	
		Number	Frequency	Duration	
1.	Smoking				
2.	Smokeless tobacco				
	a. Ghutka				
	b. Pan with tobacco				
3.	Pan chewing				
4.	Alcohol consumption				

b) Habits related to oral cavity:

a. Present	b. Past
1. Mouth Breathing	Present/absent ✓
2. Thumb sucking	Present/absent ✓
3. Tongue thrusting	Present/absent ✓
4. Bruxism	Present/absent ✓
5. Pencil/nail/lip biting	Present/absent ✓

c) Oral Hygiene Practices:

1. Type of cleaning aid: Toothbrush [✓] Finger [ ] Twig [ ] Any other [ ]

Duration - 5 minutes

1a. Type of tooth brush Soft / Medium / Hard

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2. Method of Cleaning: Vertical ☐ Horizontal ☑ Circular ☐

3. Materials Used: Colgate (fluoridated) Toothpaste ☑ Tooth powder ☐ Charcoal ☐

Sand ☐ Brick powder ☐ Any other ☐

4. Frequency of cleaning: Once ☑ Twice ☐ More than twice ☐

5. Time of brushing: Before meals ☑ After meals ☐

6. Frequency of changing the toothbrush: 5 months

Reason flaring of bristles

7. Use of other oral hygiene aids:

d) Dietary habits: mixed

1.Source of water: filter water

2. Diet : Vegetarian ☐ Mixed ☑

3. Dietary chart:

Time	Item
8:00 AM	Roti with 1 cup of coffee with spoon of sugar
12:30 PM	1 Bowl of rice with Curry.
5:00 PM	1 Cup of Coffee with Spoon of Sugar
8:30 PM	1 Bowl of rice + Curry

Staple Diet: Rice

Sugar Score = 5×2=10

Sugar Exposure: Twice

Good

4.Sugar consumption (per day)

Type: Liquid Frequency: Twice Time of intake: After meals

Form and consistency: Solid /Liquid/Sticky /Non-sticky

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VII. General Physical Examination

Built moduately Built

Posture Erect

Gait Normal

Vital Signs *

VIII. Local examination

a) Extra oral

1. Symmetry: No gross facial Asymmetry noted
2. T.M.J: Bilateral synchronous with no clicking or popping sounds are heard
3. Lymph nodes: Not palpable
4. Lip competency Competent

b) Intra oral

1. Soft tissue:

Tongue No Abnormality detected

Labial mucosa No Abnormality detected

Palate No Abnormality detected

Floor of mouth No Abnormality detected

Alveolar mucosa No Abnormality detected

Lip Competent

Gingiva Color Generalized melanin pigmentation Contour Scalloped

Consistency firm & Resilient Texture stippling present

Bleeding on probing Absent

2. Hard tissue

Type of dentition: Permanent Dentition

Number of Teeth present: 29

Teeth present:

7 6 5 4 3 2 1	1 2 3 4 5 6 7
8 7 6 5 4 3 2 1	1 2 3 4 5 6 7

Teeth missing and reason for loss: ~~+8~~ (Extraction done due to Dental Caries 1 year back)

Root stumps: Absent

Dental caries: present

Non cavitated (Initial):

Cavitated: class-I ~~8~~6|6 / Top +rc 6|

Cavitated (with pulp exposure): ~~Absent~~

Secondary Caries : ~~Absent~~

Filled teeth: ~~Absent~~

Any prosthesis: Crown ~~Absent~~

Bridge ~~Absent~~

RPD\ Implant ~~Absent~~

Wasting disease: a. Generalized ✓ b. Localized

A. Attrition present

B. Abrasion ~~Absent~~

C. Erosion ~~Absent~~

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Enamel Hypoplasia: Absent

Dental Fluorosis: Absent

Supernumerary teeth: Absent

Any other anomaly please specify: Absent

Malocclusion: Angle class-I molar relation bilaterally.

Fractured teeth Absent

Dental deposits : stains (intrinsic/extrinsic) present

calculus present

3. Periodontal Status :

Gingival recession : Absent

Periodontal pocket : localized / generalized 6+

Mobility of teeth : Absent

4. Oral Hygiene Status :

Dental deposits stains – mild
Calculus – mild.

RUSSELL'S PERIODONTAL INDEX - 1956

18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	X
X	0	6	0	0	0	0	0	0	0	0	0	0	0	0	X
48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38

$\frac{6}{28} = 0.2$ SIMPLE GINGIVITIS

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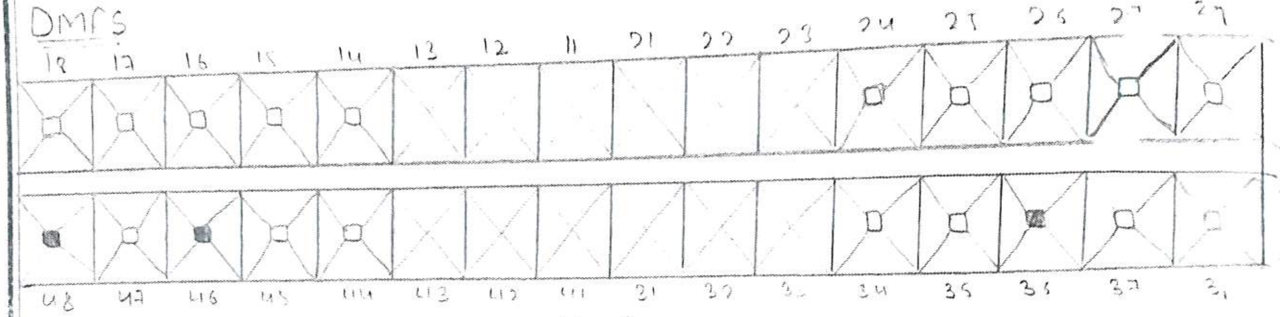
IX. Relevant Indice

DMFT INDICES – HENRY T KLEIN, CARROLE E PALMER & J KNUTSON – 1938

18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
													D		M
D		D													
48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38

DMFT = DT + MT + FT = 3+1+0 = 4.

DMFS



DMFS = DS+MS+FS = 3+5+0 = 8

NO OF INTACT SURFACES = 138 - 8 = 130 SURFACE.

OHI – JOHN C GREENE & JACK R VERMILION – 1960

DI

=> 5/6 = 0.8

(16) 0 / 1 (16)	(11) 0 / 0 (11)	(26) 1 / 1 (26)
(46) 1 / 1 (46)	(31) 0 / 0 (31)	(36) 0 / 0 (36)

CI

=> 3/6 = 0.5

(16) 1 / 0 (16)	(11) 0 / 0 (11)	(26) 0 / 0 (26)
(46) 0 / 0 (46)	(31) 2 / 0 (31)	(36) 0 / 0 (36)

= OHI = 0.5+0.8 = 1.3.

OHIS – JOHN C GREENE & JACK R VERMILION – 1964

DIS –

16	11	26
0	0	1
1	0	0
46	31	36

2/6 = 0.3 Good

CIS

16	11	26
1	0	0
0	2	0
46	31	

3/6 = 0.5 Good

OHIS = DIS+CIS = 0.3+0.5 = 0.8 – Good

COMMUNITY PERIODONTAL INDEX OF TREATMENT NEEDS – 1982

16	11	26
0	0	0
2	[illegible]	[illegible]

CP_0 = 3
CP_1 = 2
[illegible]

16	11	26
TN_0	TN_0	TN_0
TN_1	TN_1	TN_1

TN_0 = [illegible]

Apical periodontitis 6

X. Provisional diagnosis: class-1 Dental Caries 5|6

chronic generalised gingivitis with localised periodontitis 6

XI. Investigation:

IOPA 6

XII. Diagnosis: chronic periApical Abscess 6

class-1 Dental Caries 5|6

XIII. Treatment Plan: chronic generalised gingivitis with localised periodontitis 6

PRIMARY LEVEL :- Advise patient to brush twice daily with soft bristles.

- Advice modified stillman technique.
- Advise patient to visit dentist Every 6months
- Advise patient to change brush Every 3 Months.

SECONDARY LEVEL :

- Advise Oral prophylaxis.
- Advise Restoration 8|6 (GIC)

TERTIARY LEVEL : Advise Root Canal treatment 6 followed by Crown placement.

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CASE HISTORY PROFORMA - III

Student's Name: B. [illegible]

Date: [illegible] OP No: [illegible]

Patient's Name: [illegible] Age: [illegible] yrs Gender: [illegible]

Date and place of Birth: Nagarkurnool

Religion: Hindhu

Education: Graduate - 6 Occupation: student - 1

Total income of family per month: 80,000/- ->6 Kuppuswamy Socio-economic Status: [illegible]

Total number of family members: 5

Percapita income: 80,000 x12 / 5 - 1,92,000/- lower middle class

Address and Contact Number

Nagarkurnool, 9030046826

I. Chief complaint: patient complaint of (pain) dislodged filling in his lower left back tooth region since 1month

II. History of present illness: — patient [illegible] Apparently Asymptomatic 1month ago, then he developed dislodged filling in his lower left back tooth region which was not Associated with pain & swelling

III. Medical History

No relevant medical history as stated by patient

IV. Past Dental History

3rd dental Visit

2nd dental Visit - filling in lower left back tooth region [illegible]

1st Visit - Extraction in lower right back tooth [illegible] years back

V. Family History

a) Siblings [illegible] b) Marital status [illegible]

VI. Personal History

a) Adverse habits

a. Present habits *Alcoholic* b. Past Habits

Number Frequency *Occasionally* Duration *[illegible] yrs*

1. Smoking
2. Smokeless tobacco
   a. Ghutka
   b. Pan with tobacco
3. Pan chewing
4. Alcohol consumption *Occasional Alcoholic*

b) Habits related to oral cavity

a. Present b. Past

1. Mouth Breathing — Present/absent ✓
2. Thumb sucking — Present/absent ✓
3. Tongue thrusting — Present/absent ✓
4. Bruxism — Present/absent ✓
5. Pencil/nail/Lip biting — Present/absent ✓

c) Oral Hygiene Practices

1. Type of cleaning aid — Toothbrush [✓] Finger [ ] Twig [ ] Any other [ ]

Duration *5 Minutes*

1a. Type of toothbrush — Soft ✓ Medium Hard

2. Method of Cleaning: Vertical ☐ Horizontal ☑ Circular ☐

3. Materials Used: Toothpaste ☑ (Colgate (Liquidated)) Tooth powder ☐ Charcoal ☐

Sand ☐ Brick powder ☐ Any other ☐

4. Frequency of cleaning: Once ☑ Twice ☐ More than twice ☐

5. Time of brushing: Before meals ☑ After meals ☐

6. Frequency of changing the toothbrush: 6 months

Reason flaring of bristles

7. Use of other oral hygiene aids: -

d) Dietary habits: Mixed

1.Source of water: filter water

2. Diet : Vegetarian ☐ Mixed ☑

3. Dietary chart:

Time	Item
8:00 AM	2 dosa with chutney & sambar
5:00 PM	1 Cup of Tea with Spoon of Sugar
8:00 PM	1 Bowl of rice with Curry.

Staple Diet: Rice

Sugar Score = 5 x 1 = 5

Sugar Exposure: Once

Excellent

4 Sugar consumption (per day)

Type: Liquid Frequency: Once Time of Intake: Inbetween meals

Form and consistency: Solid /Liquid/Sticky /Non-sticky

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VII. General Physical Examination

Built moduately Built

Posture – Erect

Gait Normal

Vital Signs *

VIII. Local examination

a) Extra oral

1. Symmetry: No gross facial Asymmetry noted
2. T.M.J: Bilateral synchronous with no clicking or Popping Sounds are heard
3. Lymph nodes: Not palpable
4. Lip competency Competent

b) Intra oral

1. Soft tissue:

Tongue No Abnormality detected

Labial mucosa No Abnormality detected

Palate No Abnormality detected

Floor of mouth No Abnormality detected

Alveolar mucosa No Abnormality detected

Lip Competent

Gingiva · Color pale pink Contour Scalloped

Consistency firm & Resilient Texture Stippling present

Bleeding on probing present $\frac{32|1}{}$ (localized)

2. Hard tissue

Type of dentition: Permanent Dentition

Number of Teeth present: 31

Teeth present:

Teeth missing and reason for loss: 17 Extraction done 8 years back d/t to dental caries

Root stumps: Absent

Dental caries: Present

Non cavitated (Initial):

Cavitated: class-I Dental Caries 6, Buccal pit 6

Cavitated (with pulp exposure): Absent

Secondary Caries: Present 6.

Filled teeth: Absent

Any prosthesis: Crown Absent

Bridge Absent

RPD\ Implant Absent

Wasting disease: a. Generalized b. Localized

A. Attrition Absent

B. Abrasion Present 3/2

C. Erosion Absent

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Enamel Hypoplasia: Absent

Dental Fluorosis: Absent

Supernumerary teeth: Absent

Any other anomaly please specify: Absent

Malocclusion: Angles class-I molar relation bilatually.

Fractured teeth Absent

Dental deposits : stains (intrinsic/extrinsic) present

calculus — present

3. Periodontal Status :

Gingival recession : Absent

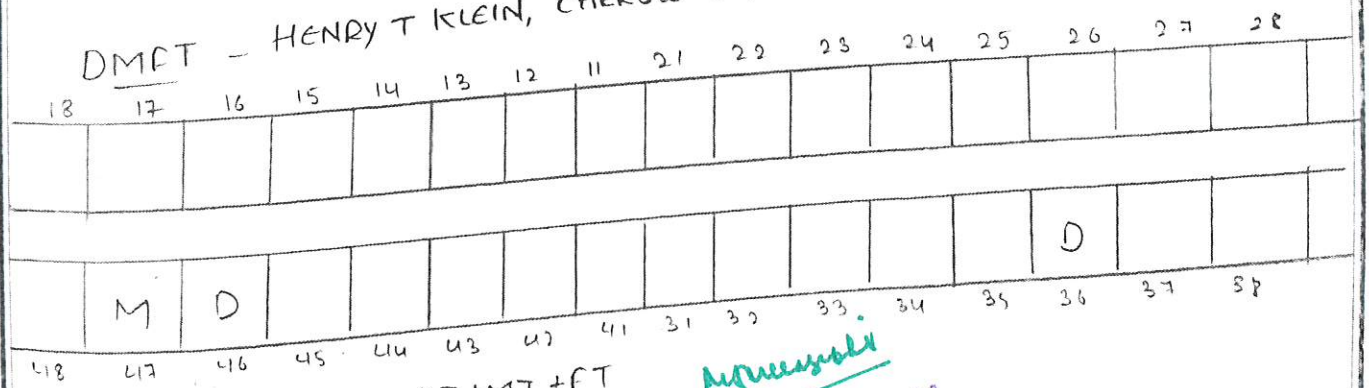
Periodontal pocket : localized / generalized Absent

Mobility of teeth : Absent

4. Oral Hygiene Status :

Dental deposits Stains - mild
Calculus - mild

DMFT - HENRY T KLEIN, CARROLL E PALMER, J KNUTSON - 1987



DMFT = DT+MT+FT
= 2+1+0 = 3

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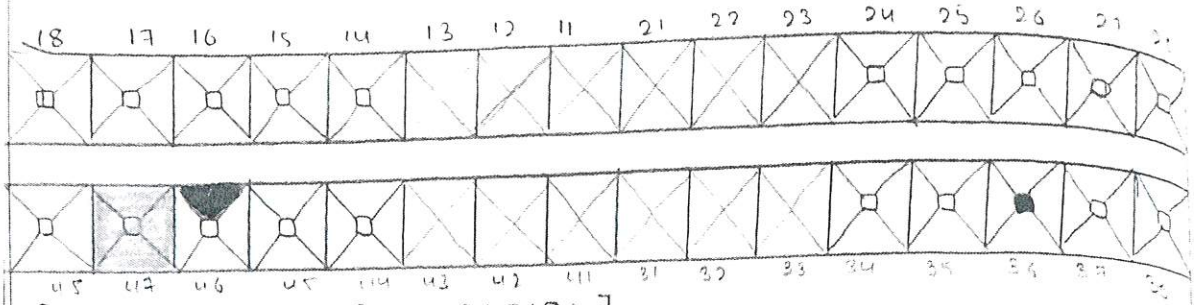
IX. Relevant Indice DMFS



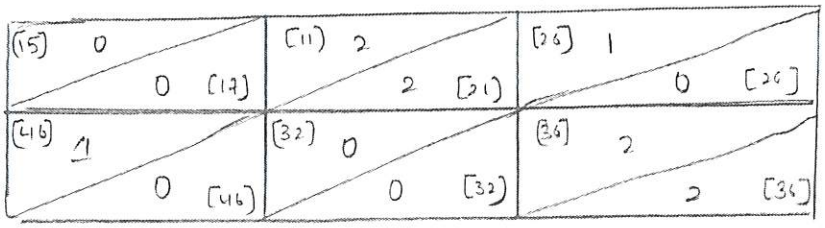
DMFS = DS + MS + FS = 2 + 5 + 0 = 7

NO OF INTACT SURFACES = 148 - 7 = 141

OHI - John C Greene & Jack R Vermilion - 1960

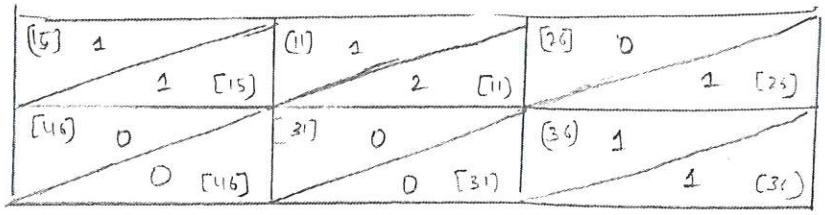
DI

$\Rightarrow \frac{10}{6} = 1.6$



C-I

$\Rightarrow 8/6 = 1.3$



OHI = DI + CI = 1.6 + 1.3 = 2.9

OHIS - John C Greene & Jack R Vermilion - 1964

DI-S

$\Rightarrow \frac{5}{6} = 0.8$

FAIR

16	11	26
1	2	0
0	0	2
46	31	36

C-I-S

$\Rightarrow \frac{2}{6} = 0.3$

GOOD

16	11	26
0	1	0
0	0	1
46	31	36

INTERPRETATION = 0.8 + 0.3 = 1.1 → GOOD

COMMUNITY PERIODONTAL INDEX OF TREATMENT NEEDS

CPI INDEX

16	11	26
0	0	0
0	1	0
46	31	36

$CP_D = 5$

$CP_T = 1$

TREATMENT INDEX — WHO + FDI - 1982

16	11	26
TN_0	TN_0	TN_0
TN_0	TN_1	TN_0
46	31	36

$TN_0 = 5$

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X. Provisional diagnosis: Class-I Dental Caries 6|
Secondary Dental Caries |6
Chronic generalised gingivitis, Dentinal hypersensitivity

XI. Investigation:
IOPA |6

XII. Diagnosis: Secondary Dental Caries |6
Class-I Dental Caries 6|
Dentin hypersensitivity
Chronic generalized gingivitis

XIII. Treatment Plan:

PRIMARY LEVEL :
- Advise patient to brush twice daily with soft bristles
- Advise modified Bass technique.
- Advise to visit dentist every 6 months, - Advise patient to change brush every 3 months.
- Advise desensitizing paste * Advise to Quit ~~Smoking~~ Alcohol Consumption

SECONDARY LEVEL :

Advised Oral prophylaxis
Advised Restoration 6|6 (GIC)

TERTIARY LEVEL : Advise replacement of missing teeth of 7|
Either by FPD | RPD | implant.

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ORAL HYGIENE INDEX

Name: Naseem fathima

Age/sex: 34/Female

Address: Mahabubnagar

Chief complaint: patient complaint of pain in her lower left back tooth region since 1 week

Oral hygiene habits:

1. Oral hygiene aid used: Tooth brush & paste
2. Method of cleaning and frequency: horizontal & once daily
3. Timing before/after meals: before meals
4. Frequency of changing toothbrush: 2 months [flaring of bristles
5. Any other oral hygiene aids used:

Teeth present: 30

8 7 6 5 4 3 2 1	1 2 3 4 5 6 7
8 7 6 5 4 3 2 1	1 2 3 4 5 6 7

Debris index John C Greene & Jack R Vermillion 1960

(16) 1 / 1 [16]	[11] 3 / 0 [11]	(26) 2 / 2 [26]
[46] 1 / 1 [46]	[31] 2 / 1 [31]	(36) 1 / 2 [36]

Score: $\frac{17}{6} = 2.8$

Calculus index

[16] 1 / 1 [16]	(11) 0 / 3 (11)	[26] 1 / 1 (26)
[46] 0 / 1 [46]	[31] 3 / 3 [31]	(36) 0 / 1 [36]

Score: $\frac{15}{6}$ = 2.5

OHI Score= Debris score + Calculus index => 2.8 + 2.5 => 5.3

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ORAL HYGIENE INDEX (simplified):

Debris index John C Greene & Jack R Vermillion - 1964

16	11	26
1	3	2
1	1	2
46	31	36

Score: $16/6 = 1.6$ fair

Calculus index

16	11	26
1	0	1
1	3	1
46	31	36

Score: $7/6 = 1.3$ fair

OHI Score= Debris score + Calculus index $\Rightarrow 1.6 + 1.3 = 2.9$

Interpretation : Fair

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ORAL HYGIENE INDEX

Name: Anjaneyulu

Age/sex: 45/Male

Address: Venuchigu Village, mahabubnagar

Chief complaint: patient complaint of pain in his lower left front tooth region since 4 days

Oral hygiene habits:

1. Oral hygiene aid used: Tooth brush & paste
2. Method of cleaning and frequency: horizontal & once daily
3. Timing before/after meals: Before meals
4. Frequency of changing toothbrush: 4 months (Flaring of bristles
5. Any other oral hygiene aids used :

Teeth present: 27 | 8 5 4 3 2 1 | 1 2 3 4 5 6 7 / 7 6 5 4 3 2 1 | 1 2 3 4 5 7

Debris index — John C Greene & Jack R Vermilion 1960

[16] 1 / 1 [15]	[11] 0 / 0 [11]	[26] 2 / 1 [26]
[46] 0 / 1 [46]	[31] 0 / 1 [31]	[37] 1 / 1 [37]

Score: $\frac{9}{6} = 1.5$

Calculus index

[16] 1 / 0 [15]	[11] 0 / 0 [11]	[26] 1 / 1 [26]
[46] 1 / 1 [46]	[31] 0 / 0 [31]	[37] 0 / 0 [37]

Score: $\frac{5}{6} = 0.8$

OHI Score= Debris score + Calculus index = 0.8 + 1.5 = 2.3

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ORAL HYGIENE INDEX (simplified):

Debris index — John C Greene & Jack R Vermillion – 1964

16	11	26
1	0	2
0	0	1
46	31	36

Score: $\frac{4}{6} = 1.1$ [fair]

Calculus index

16	11	26
1	0	1
1	0	0
46	31	36

Score: $\frac{3}{6} = 0.5$ Fair

OHI Score= Debris score + Calculus index => 0.5 + 1.1 → 1.6

Interpretation : FAIR

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SILNESS AND LOE PLAQUE INDEX (1964)

Name: Aashritha

Age/sex: 23/Female

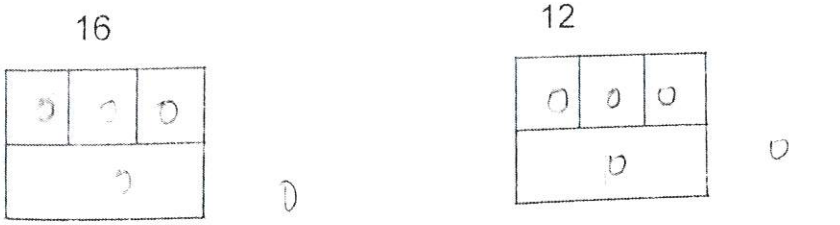
Address : Siddipet

Chief complaint: General check-up

Oral hygiene habits:

6. Oral hygiene aid used: Tooth Brush
7. Method of cleaning and frequency : horizontal gonu daily
8. Timing before/after meals : Before meals
9. Frequency of changing toothbrush : 3 months
10. Any other oral hygiene aids used :

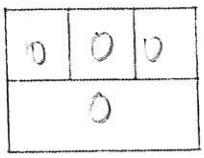
Teeth present : 28



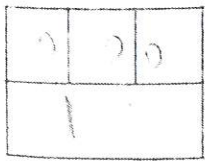
16

12

24



44



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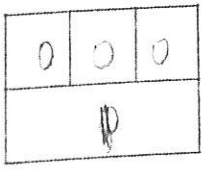

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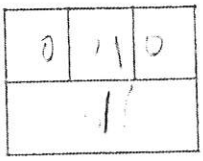

Score: 0.2/6 = 0.1

Interpretation : Good

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SILNESS AND LOE GINGIVAL INDEX (1963)

Name: Valiya Begum

Age/sex: 50/Female

Address: Mahabubnagar

Chief complaint: patient complaint of loosening of all tooth Since 7months

Oral hygiene habits:

16 Oral hygiene aid used: Tooth brush

17 Method of cleaning and frequency: horizontal & once daily

18 Timing before/after meals: Before meals

19 Frequency of changing toothbrush: 4 months

20 Any other oral hygiene aids used :

Teeth present: 28

87654321	2345678
8765432	2345678

16

2	2	2
2		

12

2	2	2
1		

24

2	2	2
2		

44

2	2	2
2		

32

2	2	2
2		

36

2	2	2
2		

Score: $\frac{47}{24} = 1.9$

Interpretation: MODERATE GINGIVITIS

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RUSSELL'S PERIODONTAL INDEX (1956)

Name: Eshwaramma

Age/sex: 65/female

Address: Mahabubnagar

Chief complaint: Patient Complaint of loosening of tooth in the lower front tooth region since 3 years

Oral hygiene habits:

26. Oral hygiene aid used: Tooth brush

27. Method of cleaning and frequency: Horizontal & Once daily

28. Timing before/after meals: Before meals

29. Frequency of changing tooth brush: 6 months

30. Any other oral hygiene aids used :

Teeth present: 30

8 7 6 5 4 3 2 1	1 2 3 4 5 6 8
8 6 5 4 3 2 1	1 2 3 4 5 6 7 8

18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
0	6	0	0	0	0	0	0	0	0	0	0	0	6	X	0
0	X	0	0	0	0	8	8	8	0	0	0	0	0	0	0
48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38

PI Scores= $\frac{\text{Sum of individual scores}}{\text{No. of teeth examined}} = \frac{36}{30} = 1.2$

Interpretation: BEGINNING DESTRUCTIVE PERIODONTAL DISEASE

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RUSSELL'S PERIODONTAL INDEX (1956)

Name: Valiya Begum

Age/sex: 50 / female

Address: Mahabubnagar

Chief complaint: Patient Complaints of loosening of all teeth since 7 months

Oral hygiene habits:

31. Oral hygiene aid used: Tooth brush

32. Method of cleaning and frequency: Horizontal & Once daily

33. Timing before/after meals: before meals

34. Frequency of changing tooth brush: 4 months

35. Any other oral hygiene aids used :

Teeth present: 28

8 7 6 5 4 3 2 1 | 1 2 3 4 5 6 7 8

8 7 6 5 4 3 2 | 2 3 4 5 6 7 8

18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
0	2	2	2	2	6	8	8	X	8	8	8	8	X	8	2
8	2	2	2	8	2	2	X	X	2	8	8	8	8	0	0
48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38

PI Scores= $\frac{\text{Sum of individual scores}}{\text{No. of teeth examined}} = \frac{198}{28} = 7.07$

TERMINAL DISEASE

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COMMUNITY PERIODONTAL INDEX(CPI)(1994)

Name: Valiya Begum

Age/sex: 50/female

Address : Mahabubnagar

Chief complaint: patient Complaint of loosening of all teeth since 7 month.

Oral hygiene habits:

36. Oral hygiene aid used: Tooth brush

37. Method of cleaning and frequency: horizontal & Once daily

38. Timing before/after meals : before meals

39. Frequency of changing toothbrush : 4 months

40. Any other oral hygiene aids used : —

Teeth present : 28

87654321	2345678
8765432	2345678

CPI Scores

17/16	11	26/27
4	3	4
4	3	4
47/46	31	36/37

$CP_4 = 4$

$CP_3 = 2$

Loss of attachment scores

17/16	11	26/27
2	1	2
2	1	2
47/46	31	36/37

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COMMUNITY PERIODONTAL INDEX(CPI)(1994)

Name: Nagaraju

Age/sex: Pallconda / 28/Male

Address :

Chief complaint: patient Complaint of pain in his Upper right back tooth region since 3 day

Oral hygiene habits:

41. Oral hygiene aid used: Tooth Brush

42. Method of cleaning and frequency: horizontal motion 2 once daily

43. Timing before/after meals : Before 4 Meals

44. Frequency of changing toothbrush : 4 months

45. Any other oral hygiene aids used :

Teeth present : 32 — 87654321 | 12345879 / 87654321 | 12345879

CPI Scores WHO + FDI-1982

17/16	11	26/27
1	1	1
1	0	0
47/46	31	36/37

code 0 = 2

code 1 = 4

Loss of attachment scores

17/16	11	26/27
TN1	TN1	TN1
TN1	TN0	TN0
47/46	31	36/37

TN0 = 2

TN1 = 4

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Name:
Age/sex:
Address
Chief cor
Place/ L
Source
Duratio
History
History
Clinica
Descr
Dean

DEANS DENTAL FLUOROSIS INDEX

Name: A. Naresh

Age/sex: 34/Male

Address : Mahabubnagar

Chief complaint: patient Complaint of discoloration of tooth since 5years

Place/ Location of living from birth to 8 years of age : Mahabubnagar

Source of drinking water : Well / Bore well ✓ / Tap / River /Any other

Duration of exposure : 5 years

History of usage of others forms of fluorides : -

History of fluorosis in other family members : -

Clinical examination : White opaque areas in Enamel of teeth are more extensive, but do not involve as much as 50% of teeth.

Description of enamel mottling :

Deans Fluorosis Index Score : 2

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DEANS DENTAL FLUOROSIS INDEX

Name: Madhuri

Age sex: 24/female

Address: Mahabubnagar Kodangal

Chief complaint: patient complaint of discolouration of tooth since 10 years

Place/ Location of living from birth to 8 years of age : Kodangal

Source of drinking water : Well / Bore well ✓ / Tap / River /Any other

Duration of exposure : 10 years

History of usage of others forms of fluorides : No

History of fluorosis in other family members : –

Clinical examination : All surface teeth are effected, brown staining is frequently disfiguring feature

Description of enamel mottling :

Deans Fluorosis Index Score : 3

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DMFT/DMFS/def /defs INDEX

Name: Anjaneyulu

Age/sex: 45/male

Address : Venuchiya Village

Chief complaint: patient complaint of pain in his upper front tooth region since 4 day

Oral hygiene habits:

6. Oral hygiene aid used: Tooth brush

7. Method of cleaning and frequency : horizontal & Once daily

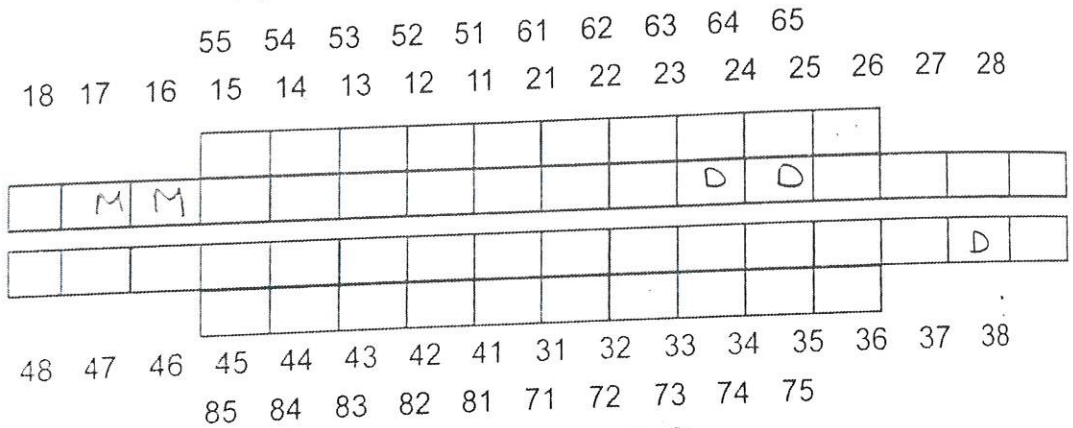
8. Timing before/after meals : before meals

9. Frequency of changing toothbrush : 4 months

10. Any other oral hygiene aids used :

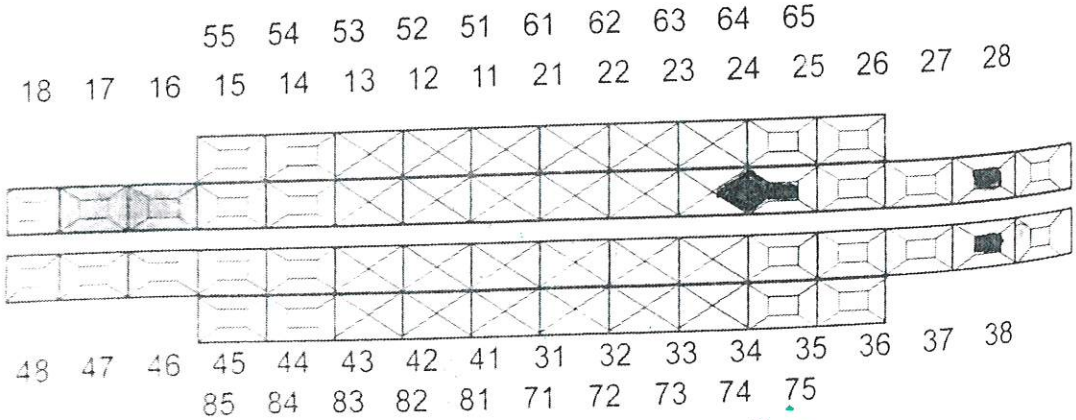
Teeth present : 27 $\frac{8\,5\,4\,3\,2\,1 \mid 1\,2\,3\,4\,5\,6\,7}{7\,6\,5\,4\,3\,2\,1 \mid 1\,2\,3\,4\,5\,7}$

DMFT INDEX



Caries Experience : DT+MT+FT = 3+2+0=5

DMFS INDEX



Caries Experience : DS+MS+FS = 5 + 10 + 25 = 40

NO OF INTACT SURFACES = 132 - 40 = 92

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DMFT/DMFS/def /defs INDEX

Name: Valiya begum

Age/sex: 90/female

Address : Mahabubnagar

Chief complaint: patient Complaint of loosening of all teeth since 7 months

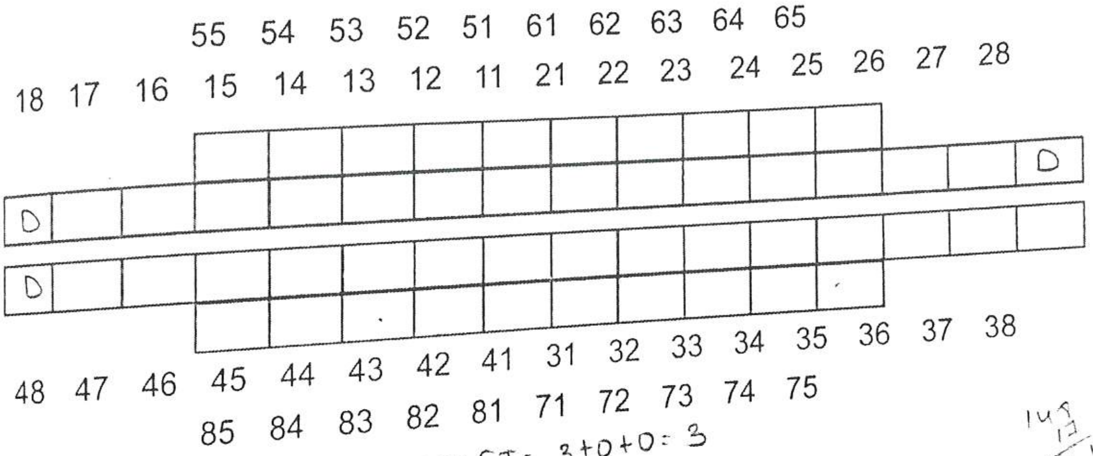
Oral hygiene habits:

11. Oral hygiene aid used: Tooth brush
12. Method of cleaning and frequency : horizontal & Once daily
13. Timing before/after meals : before meals
14. Frequency of changing toothbrush : 4 months
15. Any other oral hygiene aids used :

Teeth present : 28

8 7 6 5 4 3 2 1	1 2 3 4 5 6 7 8
8 7 6 5 4 3 2	1 2 3 4 5 6 7 8

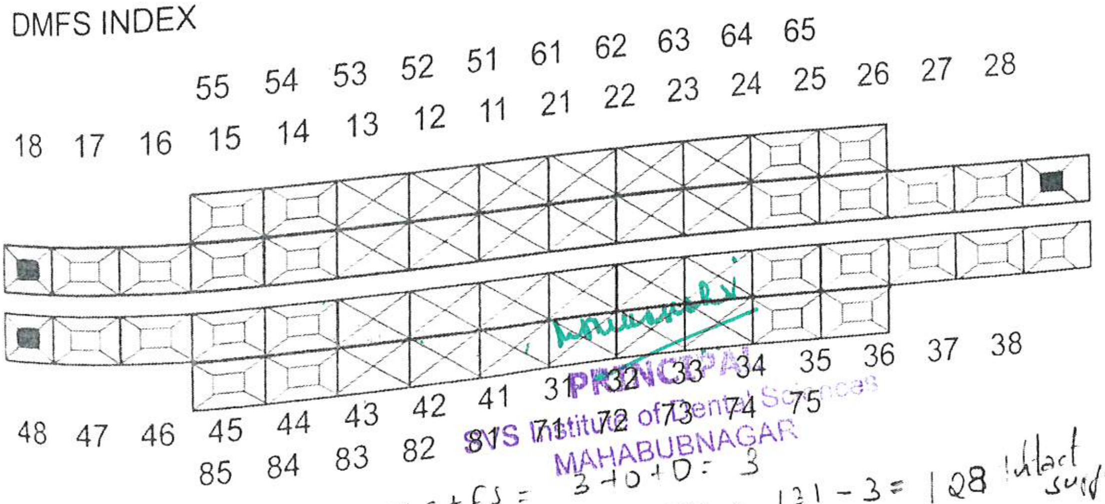
DMFT INDEX



145
13
131

Caries Experience : DT+MT+FT= 3+0+0= 3

DMFS INDEX



Caries Experience DS+MS+FS = 3+0+0= 3

NO OF INTACT SURFACES = 131 − 3 = 128 intact surfaces.

WHO ORAL HEALTH ASSESSMENT FORM [1994]

* The standard form for all oral health assessment is designed for Collection of all the information needed in planning oral care services and thoroughly monitoring of & replacing of Processing Care devices.

- The form include the following Section -

1. Summary Identification number
2. General information
3. Extra Oral Examination
4. TMJ Assessment
5. Oral mucosa
6. Enamel opacity / hypoplasia
7. Dental fluorosis
8. CPI
9. Loss of Attachment
10. Dentition stains & treatment
11. prosthetic status
12. Prosthetic need
13. Dentofacial anomalies
14. Need for Immediate Care & referal
15. Notes.

- This forms can be used for Surveying Children as well as Adults.

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TOPICAL FLUORIDE APPLICATION

Notes:

Definition :- "Topically Applied fluorides" is used to describe those delivery systems which provide fluoride for a local chemical reaction to exposed surfaces of erupted dentition

Indications:

- Caries active Individual.
- children shortly after periods of tooth Eruption, especially those who are not caries free
- Those who takes medication to decrease salivary flow and or have received radiation to head & Neck.
- After periodontal Surgery when roots of teeth are exposed.
- patients with fixed or removable prosthesis and after placement or replacement of restorations.
- patients With Eating disorder or who are undergoing a change in life style which may effect Eating or oral hygiene habits Conducive to good Oral health
- Mentally and physically challenged Individuals.

Types :- 1. Professionally Applied fluorides : 1. Fluoride Varnishes → Duraphat
→ fluorprotector
Cavex

2. Sodium fluoride Neutral
3. Stannous fluoride
4. Acidulated phosphate fluoride

2. Self-Applied fluorides :

1. Dentifrices
   - Sodium fluoride
   - stannous fluoride
   - monofluorophosphate
   - Amine fluoride
2. fluoride Mouth Rinses
3. fluoride Gels.

Techniques

1. Knutsons method (Nat + Neutral)
→ All initial Appointment, teeth are first cleaned with aqueous prophylaxis isolated with cotton rolls & dried with compressed air
→ 2% NaF applied with cotton tipped applicators and allowed it stay for 4 minutes & repeat for each segment
→ All 2nd, 3rd & 4th fluoride application scheduled at interval of one week
→ Recommended at ages of 3, 7, 11 & 13 years, coinciding with eruption of different groups of primary & permanent teeth.

2. Muhler's technique [e.g. stannous fluoride]
→ Each tooth surface is cleaned with pumice or other dental cleaning Agent for 5-10 seconds.
→ Teeth are isolated and dried with air.
→ SnF_2 is applied using the paint on technique and solution kept for 4 minutes. Repeat application are made every 6 months or more frequently if patient susceptible to caries.

3. Brudevold technique (APF gel)
→ preferred method - Aqueous preparation (paint on technique) & gel [tray technique.
→ Recommended at 6 or 12 months intervals.
→ Oral prophylaxis is done and teeth are isolated and dry.
→ A disposable foam lined tray is preferred. After trays are placed, saliva Ejector is used to evacuate the stimulated saliva and excess fluoride.
→ Reapplied every 15-30 seconds as to keep the teeth moist with fluoride solution throughout the four minute period
→ patient should be told not to swallow the gel but to exert slight pressure using cheeks and tongue as well as light biting forces.
- The fluoride gel should be in mouth for 4 minutes

PIT AND FISSURE SEALANTS

Notes:

Sealant: "A fissure sealant is material that is placed in pits and fissures of teeth in order to prevent or arrest the development of dental caries" [European Academy of pediatric Dentistry]

Pits: Small pin point depressions located at junction of developmental grooves

fissures: long clefts between cusp or ridges.

Type of fissures: ① 'V' Type ② 'U' type ③ 'I' type ④ Inverted 'Y' type ⑤ 'Y' type

Classification of Sealant:

1. Resin based Sealants

ⓐ Based on Curing method: First generation: UV light
Second generation: self Cured or chemical Cured
Third generation: Visible light
Fourth generation: Fluoride-releasing [illegible]

ⓑ Based on presence of filler: [filled / Unfilled.

ⓒ Based on their translucency: * Opaque
* Transparent.

2. Glass Ionomer Sealants.

3. polyacid modified resin based Sealants.

Steps:-

→ Polish the tooth surface.
→ Isolate and dry tooth surface.
→ Acid etching.
→ Washing and drying.
→ Isolate and dry the tooth.
→ Application of bonding Agent
→ Sealant placement and Evaluation
→ check Occlusion
→ follow-Up [Recall and Repair]

Notes:

COMPREHENSIVE HEALTH CARE

Comprehensive health Care is meeting of accumulated dental needs at the time a population group is taken into the program (initial Care) and detection & Correction of new increments of dental disease on semiannual (or) other periodic basis.

* preventive measures aimed to minimize disease are part of the Comprehensive dental Care.
* Services are provided not only to Eliminate pain & infection but also
  * Restore Serviceable teeth to good functional form
  * Replace missing teeth
  * provide maintainence Care for Control of Early lesions of dental disease.
  * Provide preventive measures, Educational & other wise

So that population Experience a lower prevalence of disease Dental Care from WOMB To TOMB, this Comprehensive dental Care in true Sense.

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CAMP (A REPORT)


MULAMMA
ARMACY
Pharm&Pharm
GPS Map Camera
Mahbubnagar, TG, India
Shah Saheb Gutta, Mahbubnagar, 509001, TG, India
Lat 16.741990, Long 78.004700
06/15/2023 12:26 PM GMT+05:30
Note : Captured by GPS Map Camera

VISIT TO WATER TREATMENT PLANT (REPORT)

The most Common form of Systemic fluoride a administration is addition of fluoride to public Water Supplies.

- Optimum level is 1ppm.
- Water fluoridation is desired as Controlled adjustment of the Concentration of fluoride in Communal Water supply so as to achieve maximum Caries reduction a clinically in significant level of fluorosis.
- fluoridation is adjustment of water supply to fluoride Content such that reductions of 50-70% in dental Caries would occur without damage to teeth / other structures.

* Limitations:

- The introduction of Water fluoridation program requires the Support of health authorities and of government in the form of laws, regulations budgets allocations etc.

*

- The Equipments must be adapted to local Conditions & need of Water network.
- It should be standard type, recognized as satisfactory & for which maintainence is easily provided
- Must be safe in order to avoid overdosage & it should provided with safety mechanism that automatically stops addition of fluoride

of the flow of water through the treatment plant is suddenly diminished

The apparatus should operate between 20% & 80% of total capacity. In Each fluoridation system, antisiophon machine should be installed in pipes that distributes fluorides entering distribution system.

* Flouride Compounds used.

a) fluorspar
b) Sodium fluoride
c. silico fluoride
d. Sodium silico fluoride
e. hydrosilico fluoride.
f Ammonium silico fluoride

Types of Equipment:

(a) Saturator System:

Principle. A 4% saturated solution of sodium fluoride is produced & injected at desired Concentration of water distribution source with aid of pump.

(b) Dry feeder.

—Sodium fluoride (or) silico fluoride in form of powder is introduced into dissolving beam with aid of automatic mechanism to Ensure maintainence of Correct supply of fluoride according to amount of water to be delivered

(c) Solution feeder.

principle — Volumetric pump pumping solution of given quantity.

Venturi fluoridator System

- It is non-electrical, system which was developed by JN. Leo
- It is activated by flow of water in main water line.
- The tank containing fluoride is made of clear acrylic thermoplastic and this enables operator to make a visual inspection of level of chemical, inorder to replenish it.

Saturation - Suspension Cone

- This System was developed by Water and Sewage authority of state of Rioarandosul, Brazil.
- It Consist of an upside down Cone charged with bag of sodium silico fluoride through which Constant flow of water protocol.
- The Solution is Collected at top of horizontal puforated plastic pipe, which form outlet.

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VISIT TO PRIMARY HEALTH CENTRE (REPORT)

- The Bhore Committee in 1946 gave Concept of PHC as a basic heart (with) unit to provide as close to people as possible an Integrated Curative and preventive health Care to rural population with emphasis on preventive & promptive aspect of health Care

* A typical PHC Cover population of 20,000 in hilly, tribal (&) difficult areas 30,000 populations in plain areas, with 4-6 (four indoor) Observation beds.

* It acts as referral unit for 6 subcentres & refer out Cases to Comm- -unity health Centres

* PHC may 2 types depending upon delivery case load:
  - Type A - PHC
  - Type B PHC

Functions of PHC:

* OPD Services - 4 hours in morning, 2 hours in afternoon (or) Evening.
* 24 hours Emergency Service.
* Referral Services
+ Inpatient Services
+ maternal & child health Care including family planning.
+ Management of health Education for prevention of Reproductive tract Infections
+ Nutritional health Services
+ Adolescent health Care
* promotion of safe drinking water & Basic Sanitation

- medical termination of pregnancies using Manual Vacuum Aspiration technique (other trained personnel and the facility exists)

- School health checkups & appropriate treatment

- Oral health
  - Oral health promotion and checkups
  - Appropriate referral or identification

- Prevention and control of locally endemic disease like malaria, kalazar, japanese encephalitis.

- Disease surveillance and control of epidemics.

- Collection & Reporting of Vital Events.

- Education about health / behaviour change.

- Communication

Primary health Centre – staff pattern:

Medical officer – MBBS – 1

pharmacist – 1

Nurse mid wife (staff nurse) – 3

Health Worker (female) [ANM – 1

Health Educator – 1

Health Assistant – 1 (Male

Health Assistant (female) [LHV – 1

Accountant cum data Entry operator – 1

Laboratory technician – 1

Multiskilled Worker – 2
group

Driver [subject to availability – 1
of Vehicle]

Sanitary Labourer cum watchman – 1

Total = 15

1 Primary health Centre = 6·2 km
25 Villages
30,000 population Plain areas
20,000 tribal/difficulty areas

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VISIT TO SEWAGE TREATMENT PLANT (REPORT)

Treatment of Sewage is divided in to 2 stages.

1) primary treatment
2) Secondary treatment.

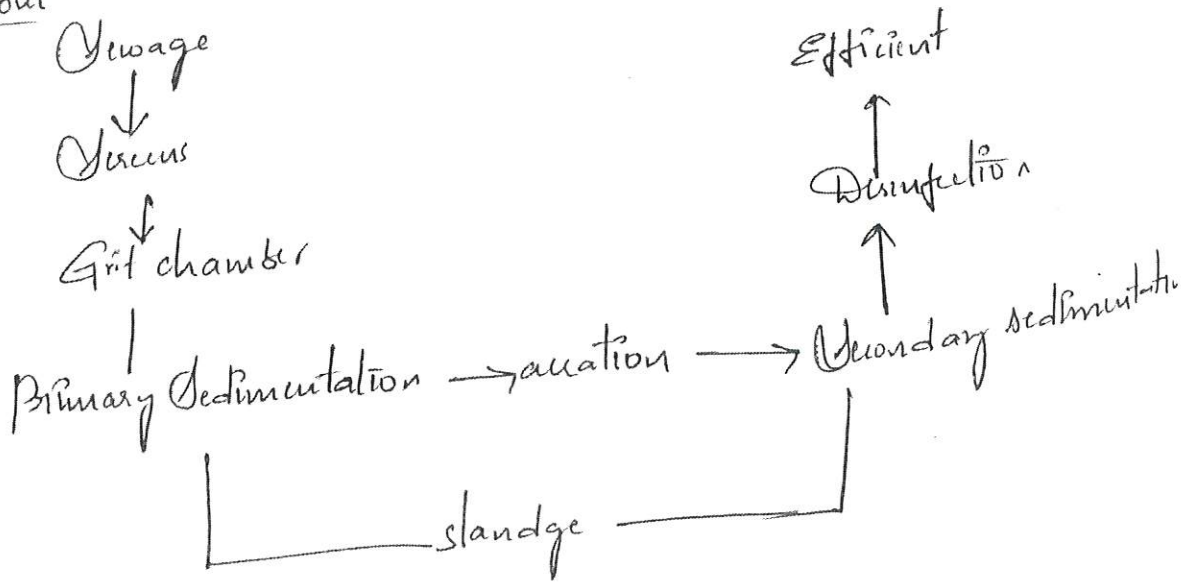
Primary treatment:

Solids are separated from sewage partly by screening & partly by sedimentation & subjected to anomally digestion.

Secondary treatment:

The Efficient to subjected to automatic Enudation

layout.



Primary treatment.

Screening Sewage activity into (or) disposed on fixed plastered through a metal screen, which intercepts larger floating objectives to prevent clogging.

Grit chamber:

- To allows settlement off heavy solids which present organic enable to pass through it.

Primary Sedimentation:

- It is accompained by use of large tank called primary sedimentation tank.

Aeration tank.

Efficient from primary sedimentation tank is detected have from further treatment

Secondary Sedimentation.

Oxidised Sewage is deposited into Secondary sedimentation tank, where it is classified for 2-3 hrs.

- This is followed by sludge digestion & disposed of effluent.

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ORAL HEALTH SURVEY (REPORT)

* Basic Oral health Survey are used to collect information about the oral health status & treatment needs of a Population & frequently monitor changes in levels, pattern of disease

* There are Specific factors associated with the most Common oral disease which have enabled to a practical economic survey sampling methodology to be defined, called path finder method.

* The finder method is stratified cluster sampling technique, which arise to include the most Important population on subgroups likely to have differing disease levels.

* It also propose appropriate no. of Subject in specific index age groups in any one locators.

* In this way, clinically relevant information for planning is Obtained at Express.

classification.

- path finder Surveys Can be classified depending on no. of & type Sample sites & age groups included.

pilot Survey. It is one that includes only one most impat. and Subgroups like in population & only 1/2 index groups, usually 12 years & on other age group.

Path finder Survey.

It incorporate Sufficient informations sites to Conc all Important Subgroups of population that may change differing disease (or) treatment needs and atleast of 3 of age of group en Index ages.

* The no. of & distribution of Sampling sizes depend upon the Specific objections of study.

* The recommended Index age groups & ages are 5, 12-15, 35-44, 65-74 years.

* The no. of Subjects in each Index age groups to the Examined range from min. of 25-50 for each cluster (or) sampling site, depending on accepted prevalence & Severity of Oral disease.

PROJECT WORK

IMPLANT MODEL:

Defination: Implant is prosthetic device (or) Alloplastic material implanted into oral tissue beneath mucosal (or) periosteal tissue and/or within Bone to provide retention and Support for fixed and Removable Prosthesis.

classification

1. Endosseous Implant
2. Subperiostial Implant
3. Transosteal Implants

Based on material:

1. metallic Implant [Ti, TiAlloy, Co-cr, Mo Alloy]
2. Non metallic Implant [Ceramic, Carbon].

Based on attachement mechanism:

- Osseointegration.
- fibrointegration.

Advantages.

1. Designed to be permanent
2. pressure the Bone
3. Donot damage the adjace
4. Look & feel like natural teeth
5. Improves Appearance.
6. Improves Speech & Self Esteem

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SEMINAR PRESENTED

SAMPLING

Definition: Sampling is a process of technique of selecting sample of adequate size and appropriate characteristics.
A sample is part of population in pharmaceutical industries.

Advantages

- It reduces the cost of investigation (time required, no of person involved)
- It also allow thorough investigation of units of observation.
- It also provide adequate and indepth coverage of sample units

Ideal Requirements of Sample:

1. Size
2. Measurability.
3. Efficiency
4. Size & Coverage
5. Goal Orientation
6. Economy & Cost Efficiency.

Sample selection: Accomplished in two ways 1. purposive selection 2. Random selection.

Sampling methods

Probability sampling methods

1. Random sampling
2. systematic sampling
3. stratified → stratified Random, stratified Systematic
4. cluster sampling.

others:
- multiphase sampling
- Multistage sampling

Non probability sampling

1. Quota sampling
2. purposive (snowball sampling)
3. Convinence sampling

Errors:
1. Sampling Errors
2. Non Sampling Errors

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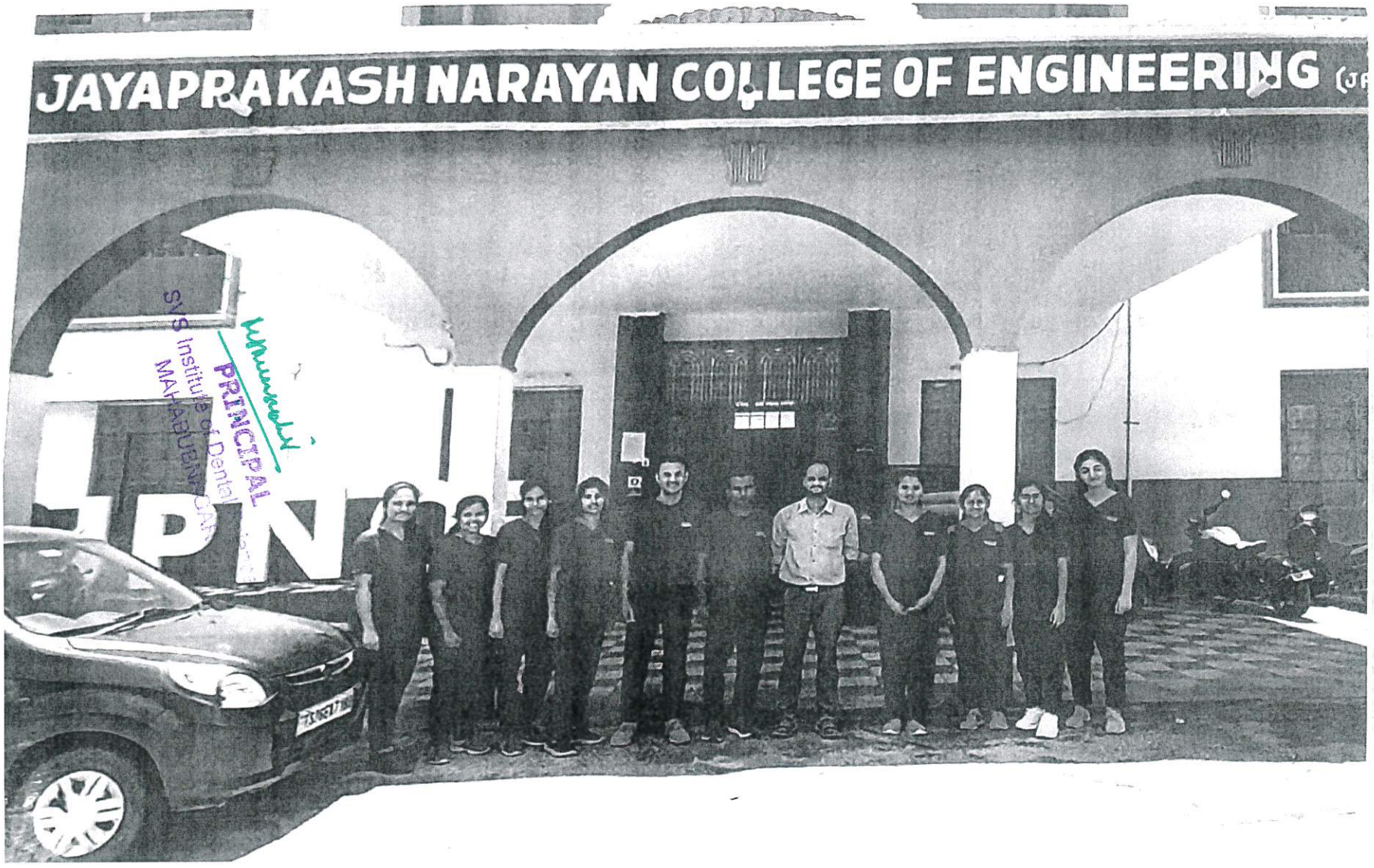
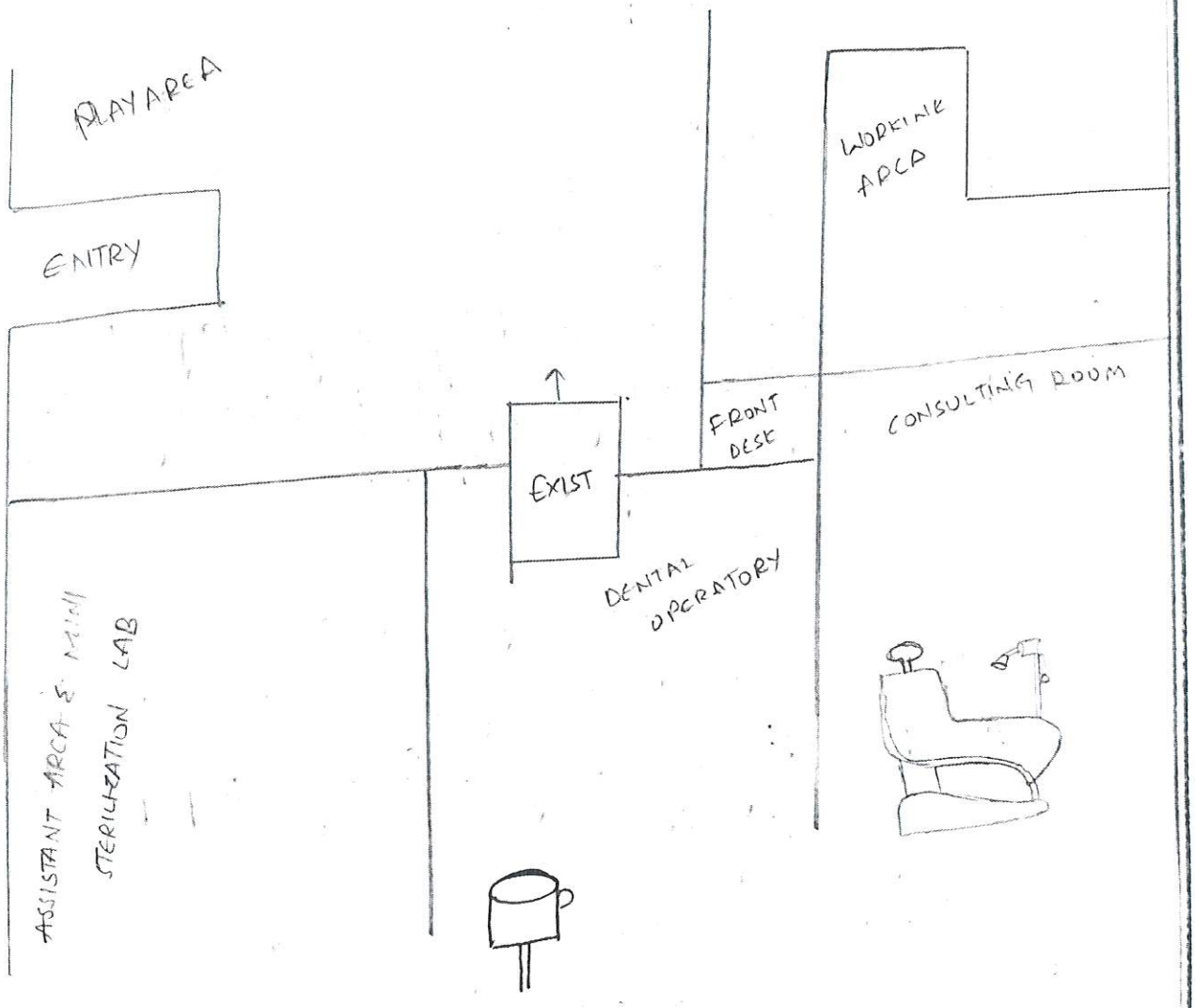
CAMPS ATTENDED



SETTING UP OF DENTAL CLINIC (REPORT)



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SETTING UP OF DENTAL CLINIC (REPORT)

The Dental office setting.

Selection of locations:

The place for private practice is selected depending upon the no. of dentists practising in that place. It is preferrable to move to a place where there are fewer dentists preferrable to move to place where there are few dentists

* In a town, which is surrounded by many villages, the location near busstops has great advantage as people from nearby villages can come easily for treatment.

Selection of Building:

It is better to select dental office in a newo building when an old building is selected one may face certain situation like:

* old building has dangered leakage, improper electrical insulation grounding etc.

* The owner of building may decide to demolish the buildings construct a newone (or) sell the building.

Designing a dental office:

- A spacious waiting area, work area with dental chair units, X-ray room, laboratory, rusting place should be incorporated into design.
- The (functions) furnitures in reception must be durable, esthetics, comfortable, otherwise patient may wonder if quantity of dental

work is cheap.

+ Sound proofing is Important Consideration in pediatric dental office.

Management of Dental office:

- private practice can be carried out in 3 following ways:
  1. solo practise
  2. Group practice
  3. Solo practice using specialities

Personnel System:

A dentist may appoint a full time receptionist, dental assistant (or) a person who can work.

Two of the most desirable treats in dental team member are Warm, Empathetic personality & Cognitive ability, defined as Aptitude for learning & Capacity to draw from past Experience in new situation.

- A training period of 60-90 days is necessary to determine whether is match between office needs & new Employed skills & personal style.

Patient System:

- The dentist should have good Communication with his patient & should see that patient's are aware of timmings, weekly holidays etc.
- If the patient fails to keep an appointement, he must be listed in Computer.

financial aspects of dental practise:

- Maintain patient record along with fee charged on day to day basis in Computer.
- Maintain records of all Expenses on day to day basis.
- Approaches a chartered account at initial stage of setting up profession itself.

- Start filling tax return from 1st year of practice itself since this would help in being how Compliment.

Production & Collection:

- for dental practise to opuate, high quality dental treatment must produced in an efficient manner.
- A production goal is Important for any Successive enterprise.
- It determine amount of money that must be changed to reach break team point & Enjoy Certain amount of profit.
- office Supplies & dental supplied amount for Considerable bulk of gross Income.
- propu Control methods, helping in saving quites an amount of in supplies
- An Inventory Control Card should be maintained for each item purchased.
- The Card Contain Information such as name, address, phone of each preferred Vendor can alternative Vendor & third Vendor.
- Therefore, Inventory Control & propu timing at purchases can Considerably reduce total cost of Supplies, indirectly Including profits.

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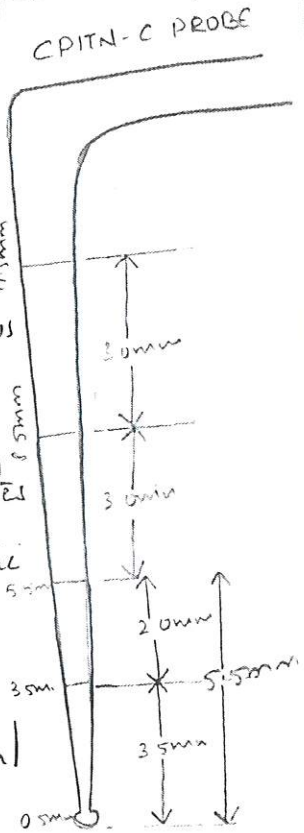
CPITN PROBE

- The Recommended periodontal probe for use with CPITN was first described by WHO (Technical Report Series 621-1978).
- This probe was designed for two purposes, namely measurement of Pocket depth and detection of subgingival calculus.
- The CPITN probe is both thin in handle and very light weight (5gms).
- This probe is particularly designed for gentle manipulation of often very sensitive soft tissues around teeth.



- The pocket depth is measured through color coding with black band starting at 3.5mm ending at 5.5mm.
- The probe has ball tip of 0.5mm diameter that allows easy detection of subgingival calculus.
- This feature combined with light probe weight facilitates the identification of base of pocket, thus decreasing the tendency for false reading by over measure-ment.
- A variant of this basic probe has two additional lines at 8.5mm and 11.5 mm from the working tip. The additional lines may be of use when performing a detailed assessment and recording deep pockets for the purpose of preparing a treatment plan for complex periodontal therapy.

→ The joint Working Committee of WHO/FDI has advised the manufacturers of FDI have advised the manufacturers of CPITN probes to identify the instruments as either CPITN-E for epidemiological prose with black band b/w 3.5 & 5.5 mm or CPITN-C for clinical prose with additional 8.5mm & 11.5mm markings.

ATRAUMATIC RESTORATIVE TREATMENT :-

ART - minimally Invasive Care approach in preventing dental Caries and stopping it further progression.

Principles: 1. Removing Carious tooth tissue using hand Instruments only.
2. Restoring the Cavity with restorative material that sticks to tooth.

Indications:
- only in Small Cavities
- In those Cavities that are Accessible to hand Instruments.
- In uncooperative / fearful patients or Special health Care needs.
- public health programs.

Contraindications:
→ presence of Swelling or fistula near Cavity.
→ pulp of tooth - Exposed.
→ tooth has been painful for long time.
→ InAccessible to instruments and Carious Signs present.

Advantages:
- Biological Approach that requires minimal cavity preparation that Conserves Sound tooth and less trauma.
- painless procedure and no need of Administration of local Anesthesia.
- Simple infection Control and no Electrically driven Instruments are used.
- Cost Effective and friendly procedure.
- more accessible for all population groups.

Limitations:
- Hand fatigue from use of hand instruments over long period.
- misconception by public that 'white filling' are only temporary fillings.

Materials used:
- Mouth Mirror
- Hatchet
- Explorer
- Tweezers
- Carver
- mixing pad & spatula
- cotton wool rolls
- petroleum jelly
- plastic strips
- Wedges
- Glass Ionomer Cement

WORK COMPLETION CERTIFICATE

This is to certify that Mr. / Ms. Mo Hasini Reddy
has completed the stipulated exercises in **III B.D.S.** Clinical Conservative Dentistry satisfactorily

Year of Admission (1st BDS) : 2018

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Department of Conservative Dentistry
& Endodontics
SVS Institute of Dental Sciences
Mahabubnagar

Date of Approval	Verified by Staff	Signature of HOD	Department Seal
12/6/23	D. Sravan		
26/7/23.			26/7/23

Instrument list for CLINICAL POSTING [3rd and 4th Year]

Instrument list for III BDS

(All Hand instruments should be either API or GDC make only

For Typodont Exercises

1. Mouth mirror handle - (Very thick handle) 3
2. Mouth mirror top (Front surface coated) 3
3. Curved probe or Explorer 3
4. Straight probe 3
5. Periodontal probe - Imported (Williams) 1
6. Tweezer 1
7. Small spoon excavator 1
8. Large spoon excavator 1
9. Enamel Hatchet 1
10. GMT - mesial 1
11. GMT - distal 1
12. Steel Cement carrier 1
13. Plastic cement carrier or Teflon coated cement carrier 1
14. Round Amalgam condenser 1
15. Parallelogram Amalgam condenser 1
16. Ball burnisher (Round) 1
17. Ball burnisher (Anatomical) 1
18. Hollenback carver 1
19. BP handle (small) & with No. 12 blades ..... 1 handle and 5 blades
20. Steel cement spatula 1
21. Plastic cement spatula (GC company) 1
22. Glass slab 1
23. Tofflemire retainer and bands 1
24. Ivory No-1 retainer and bands (Imported) 1
25. Dappen dish 1
26. Cardide burs & Daimond point For Airotor Hand Piece
    - i) Round Diamond Point (Size 009) 2
    - ii) Straight Diamond point (Size 009) 2
    - iii) Tapering Diamond point (Size 010 or 012) 2
    - iv) 24 bur 2

B) For Contra angle Hand Piece

- Large Round Cardide bur 2
- Samil Round Cardide bur 2
- 1/4 or 1/2 size Round Cardide bur for retentive grooves 2
- Tapered Fissure Buru For Polishing Composite 1

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27 Wooden wedges ..... 1 Box

28 Band cutting scissors (Curved with small head) 1

29 Amalgam carrier (metallic) 1

30 Micromotor Contra angle handpiece W&H or KAVO or NSK with oil spray can.. 1

31 Airotor hand piece W &H , MIDWEST or NSK 1

32 Plastic box or Leather pouch to keep all instruments 1

33 Disposable gloves ..... 1 Box (50 pairs)

34 Disposable mouth masks ..... 1 Box

35 Amalgam squeezing cloth (Leather or Nylon) 1

36. Spirit Lamp 1

37 Autoclavable cloth (green or blue) 2

38 Autoclavable Drape.....2

39 Cotton Holder 1

40 Kidney Tray.....2

41 Protective Eye Wear.....1

Extracted Teeth Exercises

Diamond disk & Mandrel for tooth sectioning (for Contraangle handpiece) 1

Extracted Teeth to be mounted on plaster base (14 teeth) (archwise arrangement)

Vertical sectioning : Maxillary 1st premolar ..... 1 tooth

Mandibular molar ..... 1 tooth

Carbide burs & Diamond point For Airotor Hand Plece

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All the Instruments mentioned in III year Instrument list

In addition to the above the following instruments to be brought for extracted teeth exercises.

1. Root canal files - 25 mm length K - files - size 15 to 40 ..... 1 pack

   size 45 to 80 ..... 1 pack

2. Barbed broach ..... 1 pack

3. 2 cc disposable plastic syringes ..... 2 Nos.

4. Extracted teeth mounted on plaster base (14 teeth) archwise arrangement.

5. Extracted single rooted tooth for Root Canal Treatment (Maxillary Central Incisor preferable)

6. Endo. Box (Autoclavable) _____ 1

7. Endo. Scale (Autoclavable) _____ 1

8. Spreaders 25mm length, Size 15-40 _____ 1

9. Endo access bur (or) no.4 Round bur and SF14 straight bur _____ 1

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III BDS Exercises

Exercises on Patients

1.	Class I - Silver Amalgam	-	15
2.	Class III (distal of canine) - Silver Amalgam	-	1
3.	Class III - Glass Ionomer / Composite	-	2
4.	Class V / Buccal Pit - Glass Ionomer	-	3

Exercises on Extracted teeth

1.	Class I - Silver Amalgam	-	4
2.	Class II - Silver Amalgam	-	2
3.	Class III, Class V / Buccal pit - Glass Ionomer	-	2
4.	Class I - Composite	-	1
5.	Class IV - Composite	-	1
6.	Vertical sectioning of 2 extracted teeth	-	2
	(a) Maxillary 1st Premolar - Bucco - Lingual sectioning		
	(b) Mandibular Molar - Mesio - Distal sectioning		

Note : (Vertical sectioning to be done in the Pre-clinical conservative lab only using diamond disc or carborandum disc mounted on a Micromotor Contrangle handpiece)

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WORK COMPLETION CERTIFICATE

This is to certify that Mr. / Ms. M. Harini

has completed the stipulated exercises in **IV B.D.S.** Clinical Conservative Dentistry satisfactorily

Year of Admission (1st BDS) : 2019

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12/7/23
Date of Approval

Verified by Staff

Signature of HOD

Department of Conservative Dentistry & Endodontics
SVS Institute of Dental Sciences
Mahabubnagar
Department Seal

26/7/23

IV BDS Exercises

Exercises on Patients

1. Class II Silver Amalgam 10
2. Class IV Composites (Rubberdam mandatory) 4
3. Cuspal Pin restoration on grossly decayed Molar for Silver Amalgam 1
4. Root canal treatment in single rooted tooth (Rubberdam mandatory) 1

Exercises on Extracted teeth

1. Class II Silver Amalgam 2
2. Class III or Class IV Composite (Rubberdam mandatory) 2
3. Class II Inlay on Molar (Maxillary or Mandibular molar) 1
   - Direct wax pattern, Investing , Cutting of Sprue, Metal tryin & Polishing to be done by the student. (Only casting procedure will be done by the technician)
4. Root canal treatment in Maxillary Incisor (Tooth mounted on stone block)
   - Access cavity, Working length , Biomechanical preparation , Obturation and Access cavity closure with Composite.

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Cavity Design's for Composite Restoration

Cavity preparations for composite resins should be as conservative as possible.

Conventional cavity preparation:

They are typical amalgam cavity preparation design with uniform depth, flat, floor, joint & retention grooves in dentin. This design indicated on root surfaces & large class I & class II composite restoration.

Beveled Conventional cavity:

It is indicated when composite resin is used to replace an existing restoration with a conventional design indicated in class III, IV & V cavity restoration.

Modified cavity preparation:

They have scooped out appearance without definite interval line angles indicated for initial & small carious defects.

Box only cavity preparation:

Indicated to proximal caries in posterior teeth when occlusal surface is not involved.

Slot cavity preparation:

Indicated for posterior teeth with proximal caries when access can be achieved from facial or lingual aspect.

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Steps In Cavity Preparation For Composite

Clinical Techniques for composite resin restoration:

preliminary steps:

1. local anesthetics: This is performed in most patients as it reduces apprehens & salivation administering local anesthetics makes patient relaxed & comfortable thus contributing to better operative dentistry, especially while placing bonded restorations.

2. prophylaxis: Oral prophylaxis is necessary before Composite restoration. This will creak a operative site that is more respective to bonding pumic prophylaxis is recommended to remove plague, salivary pellicle & surface stains.

3. shade selection: Selecting the appropriate shade of teeth is very essential to achieve optimum esthetic with composite resin

4. Isolation: proper isolation of operative site is very importan. for composite resin restorations as contamination of saliva or moisture decrease bonding strength also physical properties of composite material may be attached. The best means of isolation for composite restorations is by rubber dam. Alternative method are cotton roll & saliva ejector.

5. Check occlusal contact:

preparation assesment of occlusion has to be carried out so that cavity preparation may be done & such away to keep margins away from area of occlusal coding.

General Concept for Cavity preparation for composition.

1. Minimal extension:

The preparation is kept as minimal & conservative possible only to extent for caries or defect & for convience form

2. Pulpal & axial wall of varying depth:

The wall need not be ~~that~~ & can be of varying depth.

3. Enamel level:

This is indicated in some cavity preparation for better etchin bonding & to merge restoration with tooth.

4. Butt joint on root surface:

Cavosurface margins on ~~root~~ surface should be 90.

5. Tooth preparation walls must be rough:

This is to increase the surface area for bonding. Generally diamond abrasives are used to adhesive the margins.

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Krasner & Rankow's laws of access opening.

- law of centrality: The floor of pulp chamber is always located at centre of tooth at level of CEJ.
- law of concentricity: The walls of pulp chamber are always concentric to external surface of tooth at level of CEJ.
- law of CEJ: The distance from external surface of clinical crown to wall of pulp chamber is same throughout circumference of tooth at level of CEJ. The CEJ is most consistent repetable landmark for locating the position of pulp chamber.
- law of symmetry: Except for maxillary molar the orifice of canals lie on a line perpendicular to a line drawn in a mesiodistal direction across center of floor.
- law of colour change: The colour of pulp chamber floor is always located at junction of walls & floor.
- law of orifice location 1: The orifices of root canals are always located at junction of walls & floor.
- law of orifice location 2: The orifices of root canal are located at angles in floor wall junction.
- law of orifices location 3: The orifice of root canal are located at terminus of root development fusion lines.

Access Cavity Preparation & Laws of Orifice Location

Goals of access cavity preparation:

- Removal of all carious tooth structure.
- Conservation of sound tooth structure.
- Complete deroofing of pulp chamber.
- Removal of coronal pulp tissue.
- Location of root canal orifices.
- Straight line access to root canal.

Clinical guidelines for a access cavity preparation.

I. Preoperative considerations.

A) Armamentarium for Access cavity preparation.

- Front surface mouth mirrors.
- Rotor & slow-speed rotary handpieces.
- Burs - Round carbide burs, diamond burs with round cutting ends, fissure carbide burs, extended-long shank burs as mueller burs & LN burs.
- endodontic spoon excavator
- Endodontic explorer eg- DG-16
- Additional aids - magnification & illumination aids, ultrasonic micro openers & microdebriders.

B) Assessment of occlusal tooth anatomy.

- presence of an aditional cusp.
- Abnormality in the size & shape of tooth.

major principle of endodontic cavity outline form - Internal anatomy

of tooth dictates external outline form. size & shape of orifice/ cavity/canal preparation relates to size & shape of pulp chamber.

- Complicating factors:
- Rotated teeth/mal positioned teeth.
- Tipping/mesial tilting of tooth.
- Grossly decayed teeth
- Teeth will full coverage restorations.
- Teeth with extensive calcifications.

2. Radiographic assessment: The most important prerequisite for successful access cavity preparation is having a sound knowledge of root canal anatomy & its variations visualisation of internal anatomy of tooth can be done using preoperative periapical radiograph.

II. Clinical considerations.

A) Complete removal of carious teeth str & other restorative materials while preparing the access cavity in a carious involve tooth start removing the carious tooth str irrespective of location of carious lesion. This would invariably lead into pulp chamber.

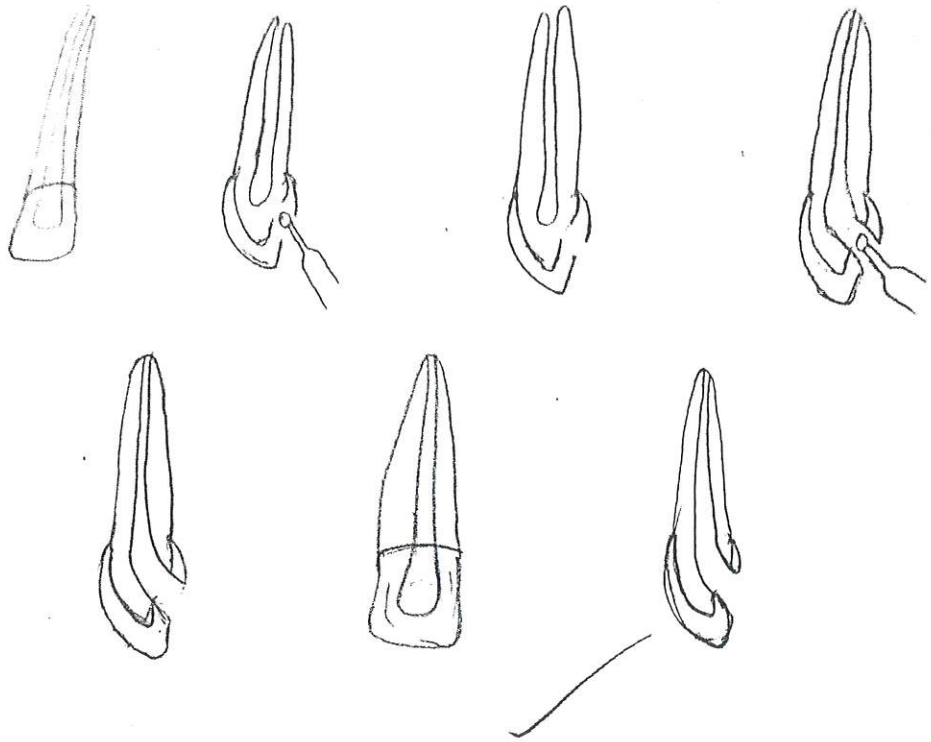
- Hence in case of tooth with distal carious tooth str access opening comences from distal to mesial pulp chamber.

B) Complete Deroofing & Removal of Dentinal shoulders:

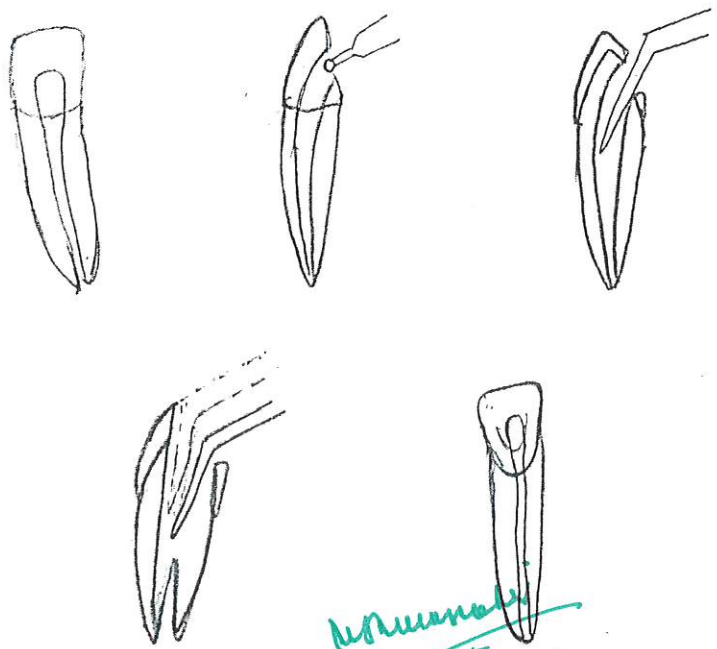
The overhanging roof of pulp chamber misdirect instruments which result in ledge formation in canal. Hence complete deroofing must be done to obtain unrestricted access to canals using a round bur & working from inside out will accomplish this end. Removal of dentinal shoulders present b/w root canal orifices will help in

Diagramatic reprasentation of access cavity preparation

1) Maxillary Incisor



2) Mandibular Incisor



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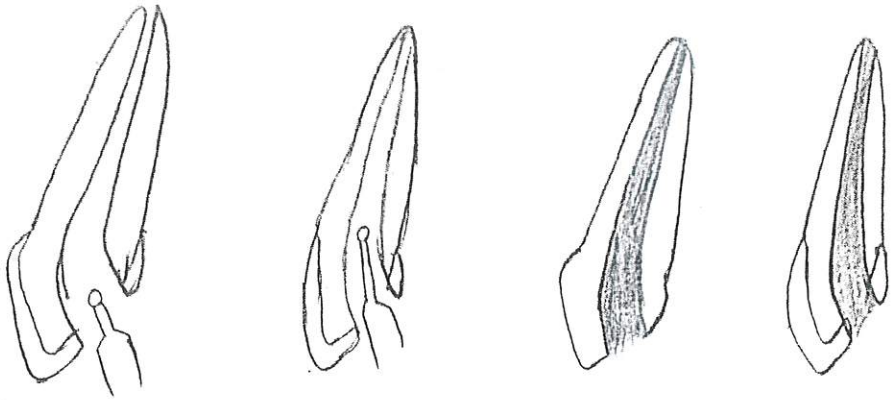
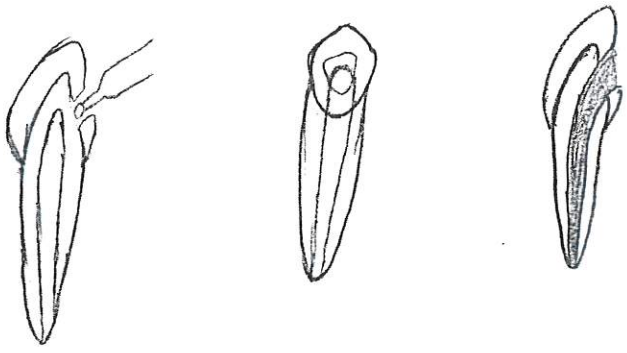
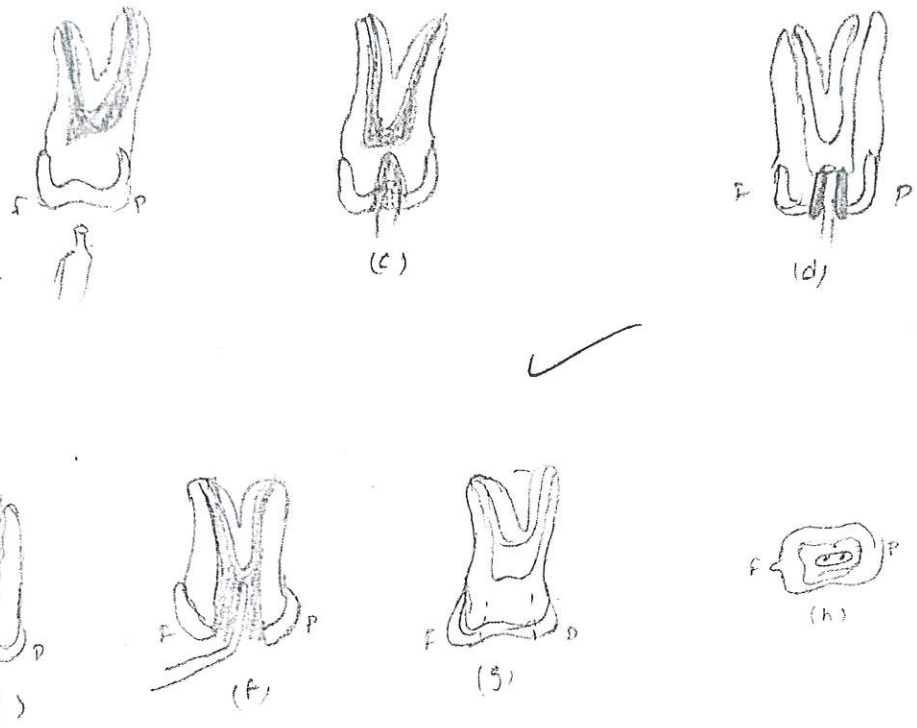
3) Maxillary canine



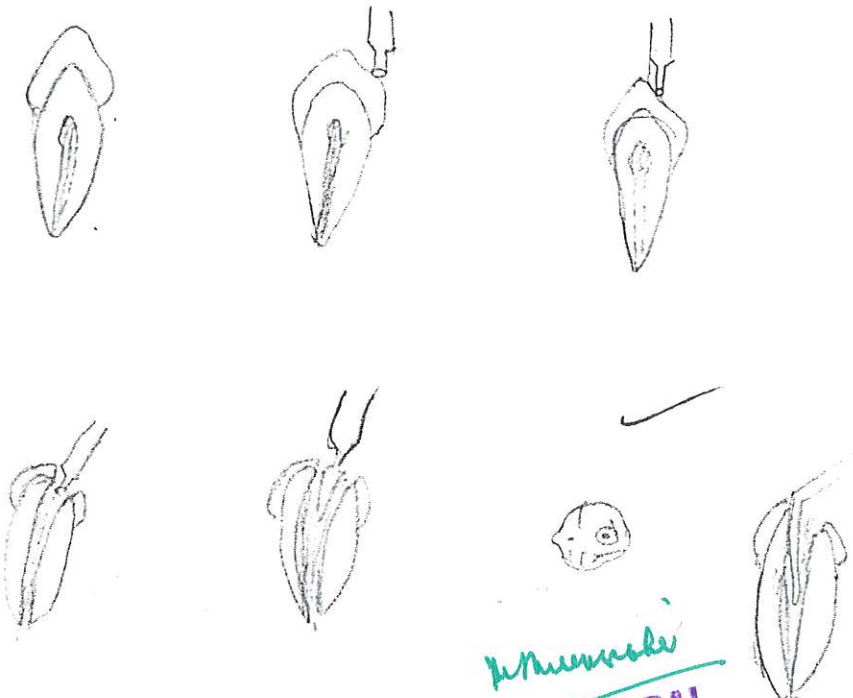
4) Mandibular canine



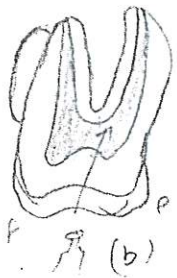
5) Maxillary Premolar



6) Mandibular Premolar



7) Maxillary Molar



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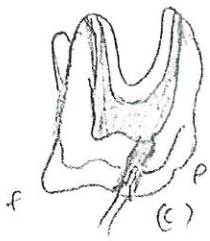

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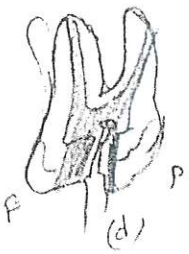

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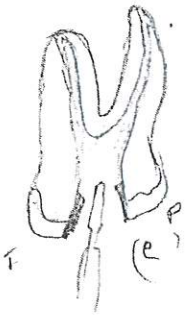

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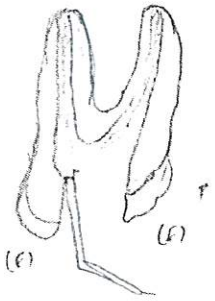

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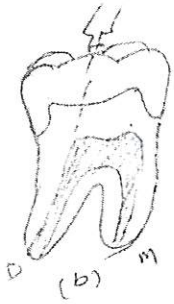
8) Mandibular Molar



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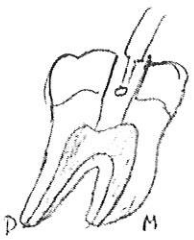

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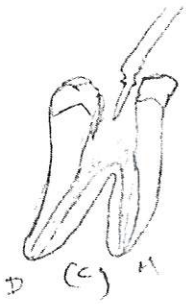

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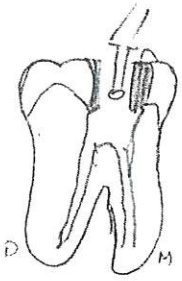

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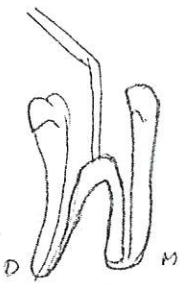

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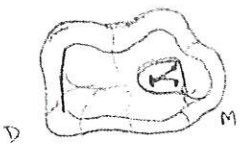

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Various Isolation Methots

Isolation from moisture : Direct method

. Rubber dam & isolation

. cotton Roll isolation & cellulose waters

. Throat sheilds

. High volume excavators & saliva ejectors

Isolation from soft tissue :

. Mirror & Evacuation lip retraction

Isolation from moisture : Indirect method

. Drugs

. comfortable position of patients & relaxed

. local anesthesia.

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Rubber Dam Isolation in Detail

- All restorative & endodontic applications require mandatory use of rubber dam
- To achive the first principle of endodontic treatment a safe & aseptic operating technique needs to be maintained.
- To rise operating without a rubber dam is to rise one professional reputation.
- The rubber dam can be applied in less than 2 min & often within 1 min.

Advantages:- 1. Dry aseptic field.

2. protects patients soft tissue from sodium hypochlorite irrigation & other caustic medicaments.
3. prevents aspiration of endodontic instruments.
4. Improves access & visibility.
5. Prevents contamination of root canal with oral microbialogic flora.

Components of Rubber dam kit.

- Rubber dam material
- Rubber dam clamps
- Rubber dam clamp carrying forceps.
- Rubber dam punch.
- Rubber dam frames
- Rubber dam template
- wedget cord
- Dental silk floss, Rubber dam napkins.

only 5 clamps are needed for applying the rubber dam to most teeth
- for anterior teeth : Hf 9
- for premolar teeth : Hf 1 & Hf 2
- for molar : Hf 2 & Hf 4

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Isolation Technique:

1- Anterior tooth isolation: The dam is stretched & placed over incisor
↓
placement of clamp
↓
The jaw of clamp must rest on sound tooth str.
↓
palatally jaw of clamp engage to tooth gingival to cingulum

2- Posterior tooth isolation:

Dam is placed on rubber dam templates & tooth to be isolated is marked
↓
Hole is punched wing rubber dam punch.
↓
wings of clamp engage the dam through punched hole
↓
Dam is secured with rubber dam frame
↓
Dam is gently teased away from wing of clamp using a blunt hand instrument
↓
Dental floss is passed mesially & distally.

3. Multiple tooth isolation:

Testing & lubricating proximal contact
↓
Clamp is engaged using forceps.
↓
jaws must engage tooth gingiva to contour height
↓
check the stability of rubber dam with finger on clamp bow
↓
Dam is pushed over bow.
↓

Dam is stretched & passed below teeth contact area with dental floss.
↓
Secure dam on anterior anchor dam is carefully placed around clamp.

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Write in detail about Access cavity preparation for maxillay central incisor

Average tooth length: The average length of this tooth is 23.5 mm.

Pulp chamber: The pulp chamber of maxillary central incisor is located in center of crown equidistant from dentinal walls. It is broad mesiodistally, with its broadest part incisally aligned. The pulp chamber usually follows contour of crown & has 3 pulp horns that correspond to developmental mamelons in young tooth. The chamber is ovoid mesiodistally. Division b/w root canal & pulp chamber is indistinct.

Root & Root canal: The maxillary central incisor has one root with one root canal. The root canal is broad labiopalatally, large & simple in outline, conical in shape, & centrally located. A definite apical constriction is present in mature root canal. In cross section, canal is ovoid mesiodistally in cervical 3rd, ovoid to almost round in middle 3rd & round in apical 3rd.

Clinical significance: • Although the majority of roots are straight (75%) may curve labially (or palatally (18%). Root canal usually follows direct^{n} of curved root. palatal & labial curvatures may not be seen in routine radiograph unless taken at different horizontal angulation.

• lateral canal may be present usually in apical 3rd.

• labial surface of root of maxillary central incisor lies under labial surface cortical plate of maxilla & may fuse withit. Because of proximity of labial root surface to cortical plate, fenestrations the labial cortical plate.

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• The relationship b/w apex of maxillary central incisor & cortical plate of floor of nasal cavity depends on height of face & length of root. usually, nasal fossa & root apex are seperated sufficiently so that curettage of granuloma tissue within the surrounding cancellous bone doesnot result in perforation of floor of nasal fossa. In some patients apex of root is close to nasal floor.

Access opening: The shape, size & coronal extension of pulp chamber are estimated from a diagnostic radiograph. Internal anatomy str of pulp chamber of maxilla central incisor dictates shape & size of access opening.

• The enamel is perforated in center of lingual surface at an angle perpendicular to it Center of lingual with no.4 round bur at high speed contra-angle after penetration of enamel, the bur is directed along the axis of tooth until pulp chamber is reached. A "drop of bur into chamber may be felt if camber is large enough overhanging enamel & dentin of palatal root of pulp chamber are removed including pulp horns, with round bur in slow speed contra angle. by working from inside to outside following internal anatomy.

• A gates-glidden drill of appropriate size or any other suitable orifice enlarger is used to remove palatal shoulder by working from inside to outside with light strokes. The palatal shoulder is not an anatomic entity itself, but rather prominance of dentin created when palatal roof & palatal shoulder of pulp chamber in anterior tooth direct area access can be verified by placing straight end of endodontic Explorer into canal orifice. Explorer should follow path of central canal without impedance from the walls surrounding access preparat.

Define working length & Methods to determine working length

Definition: Working length is defined as distance from a coronal reference point at which canal preparation & obturation should terminate.

Anatomical considerations: Theoretically the canal preparation should extend apically to cemento-dentinal junction. This junction is located at or near greatest constriction of apical foramen. The cementodentinal junction does not always coincide with apical constriction & is located 0.5-0.75 mm short of anatomical apex. Thus it clinically recommended to terminate instrumentation & obturation 0.5-1.0 mm short of radiographic apex.

Kuttler's study: The apical foramen does not normally exite at anatomical apex it deviates by 0.5-0.3 mm. This variation is more marked due to: continuous deposition of cementum in older patients.

Terminologies:

Anatomic apex: It is defined as tip or end of root determined morphologically

Radiographic apex: It is defined as tip or end of root determined radiographically.

Apical foramen (Major diameter): It is the main apical opening of root canal. It is frequently centrically located away from anatomical/radiographic apex.

Apical Constriction (Minor diameter): It is apical portion of root canal having narrowest diameter.

Cementodentinal junction: It is the region where the dentin & Cementum are unified. It is histologic landmark.

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Radiographs:

Radiographs plays an important role in cleaning & shaping because it permits the operator to town visual conceptional internal tooth str & periradicular tissue. It is an exact road map of anticipated journey b/w the access opening in to pulp chamber & apical root foramen.

- The clinican must learn to interpret or rather read a radiograph to asist instrument selection for exploration of complicated root canal system.

Method of Determining coorking length:

I. electronic apex locators.

II. Radiographic method

1. Ingle's technique
2. others. a) Best's method
   b) Bergman's method
   c) Bramonte's techniqu
   d) grossman's method.
3. Kuttler's method.
4. x-ray grid method.
5. radiography.

III. Non-radiographic method.

1. Tactile
2. Apical periodontal sensitivity.
3. paper point method.

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Write in detail about ingles method of working length Determination

Clinical prerequisites:

Knowledge of average length of teeth: The setting of an instrument stop to a length short of anticipated working length for each canal is valuable in confining instrument to root canal to prevent trauma or forcing of debris & bacteria into periradicular tissue.

Instrument precurving: The desired instrument curvature is attained by grasping blade with gauze sponge & bending instruments in a gentle slope. An instrument that aids bending file approx has been introduced & known as endobender.

- Stable occlusal reference point. Anterior teeth → Incisal edge posterior teeth → cusp tips
- The reference point must be a definite & reliable point (or) surface to ensure Exactness in all subsequent measurment.
- silicone stopper on file is set to these reference points & extent of file from bottom of stopper to tip of instruments is used to determine estimated working length.
- These stoppers also value an added advantage because they donot have to be removed from instrument during sterilization

Clinical technique:

- Diagnatic (or) Exploratory instrument usually NO.6, NO.8 (or) 10 K files. These instruments are flexible enough to follow root-canal curvatures & to fit into fine tortuous canal & are enough to be inserted through debris & tissue until they reach root apex. Initially the K-file is inserted into the root canal through access cavity with slight motion to bypass any obstruction (debris & PS) and passed along entire canal length.

The estimated working length is kept as 1mm short of length of tooth measured on radiograph. This is done to compensate for radiographic image distortion & for fact that minor diameter always present short of anatomical apex.

- The precoronal enlargement of canal is completed with help of either orifice enlargers/Gaddico drills. This step recommend before taking working length x-ray
- A working length instrumentation radiograph is taken to compare exact position of instrument in root canal.
- If change of tactile sensation during exploration of root canal suggest that instrument is at apical constriction, even though it seems short of estimated working length.
- The working length should be arbitrarly established 0.5 - 1 mm shorter than radiographic canal length because the actual length of tooth is less than radiographic canal length because image of apical foramen is approx 0.3 mm short of actual root tip certain anatomical studies has reported the CDJ situated about 0.4 - 0.7 mm away from root apex.
- Two length-determination radiographs may be necessary at times, one at normal angulation & other at 20° mesial or distal horizontal angulation. The tridimensionally gained from these two views allows better visualization of the configuration of tooth root canal & its terminus. when two root canals are present in single root. Eg. mesial root is mandibular molar of two root aligned, in same plane, such as maxillary first premolar, two radiographs from different angulations.

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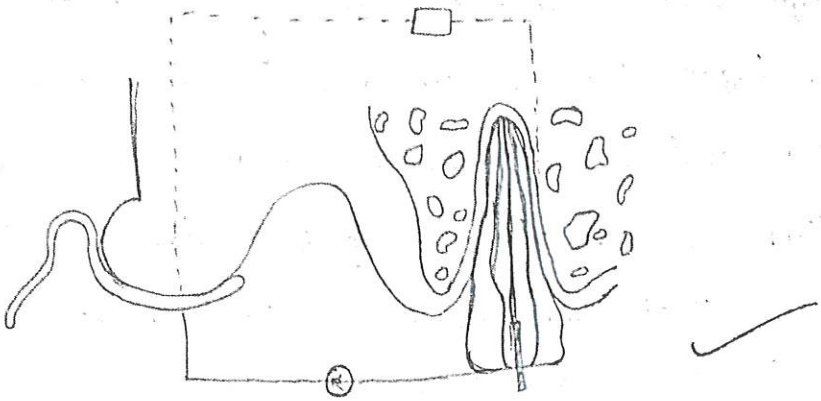
APEX LOCATORS

currently an electronic apex locator is the most optimal & accurate method to establish the root canal working length.



The working length is determined by comparing the electrical resistance of periodontal membrane with that of gingiva surrounding tooth, both of which should be similar. A probe, such as file, is attached to an electronic instrument with an electric cord & is inserted through the root canal until it contains the surrounding periodontal ligament. when probe touches soft tissue of periodontal membrane, the electrical resistance gauges, for both gingiva & periodontal ligament would have similar reading. By measuring the depth of insertion of probe, one may determine exact working length of root canal. The clinician should note that electronic apex locators are not alternative to use of radiographs in endodontics but they are powerful & useful adjunct to radiographs in the accurate clinical measurement of root canal working length.

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Classification of electronic apex locators:

First generation - resistance based electronic apex locator:

These are first generation of apex locators which developed based on resistance principle. They worked best in dry canals. However, the presence of pus, pulpal tissue, blood, & irrigants lead to inaccurate reading. The first locator based on this principle was root canal meter.

Second generation - Impedance based apex locator:

In order to overcome the problems associated with resistance based apex locator, Inoue introduced concept of impedance-based apex locators, Sono Explorer apex locator. This device would indicate the apex when two impedance values approach each other. This apex locator had to calibrated with periodontal sulcus prior to each use. This procedure was technique sensitive (each) & Error prone.

Third generation - Multiple frequency apex locator.

These apex locators determine the canal terminus as difference b/w the impedance values at two different frequencies of 1 & 5 KHz. This was introduced as Endex apex locator.

Fourth generation - multiple frequency ratio-based apex locator.

A Newer apex locator was introduced that uses two wavelengths whose impedance could be compared, as a ratio. These are superior to other apex locators in presence of fluids & electrolytes. The other apex locator which follow the similar principle include proper IQ & element diagnostic.

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Standardization of Endodontic Instruments

Ingle & levine's standardization of endodontic hand instrument.

- Instruments shall be numbered from 10 to 100, the numbers to advance by 5 units to size 60 & they by 10 units to size 100. This has been revised to include numbers from 6 to 140.
- Each number shall be representative of diameter of instruments in hundredths of a millimeter at tip; eg no. 10 is 10/100 (or) 0.1 mm at tip. no. 25 is 25/100 (or) 0.25 mm at tip & no. 90 is 90/100 or 0.9 mm at tip.
- The working blade (flutter) shall begin at tip, designated site D_0 & shall extend exactly 16 mm up the shaft, terminating at designated site D_{16}.
- The diameter of D_{16} shall be 32/100 or 0.32 mm greater than that of D_0 eg - a no. 20 reamer shall have a diameter of 0.20 mm at D_0 & Diameter of 0.20 plus 0.32 (or) 0.52 mm at D_{16}.

The sizing ensures a const increase in taper of 0.02 mm for every instrument regardless of size.

- The tip angle of an instrument should be 75±15°.
- Instrument size should increase by 0.05 mm at D_0 b/w no. 10 & 60 eg no. 60 to 150.
- No. 6 & 8 have been added for increased instrument selection.
- In addition, instrument handles have been color coded for easier recognition.

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Components of endodontic file:

Taper: Taper denotes the permillimeter increase in file diameter from the tip towards the file handle it is denoted either in numerical or percentile. Tapered instrument help in preparing canals of wider diameter without over enlarging the canal at working length.

Tip design: original stainless steel root canal instruments usually possy a sharp, cutting tip, however rotary instrument currently are manufactured with modified non cutting tip as there noncutting tips cause less canal transportations remove debris better than traditional instrument.

flute: It is groove or relief on the working of file which collects debris as file cuts through substract.

Chip space: The chip space denotes cleaning effectiveness of instrument as an increase in chip space denotes improved ability to remove debris out of root canal.

Blade: It is working area of file & is surface with greatest diameter that follows flute as it rotates.

Land: In certain file designs a surface projection axilla from central core of cutting edge b/w flute.

Pitch: It is distance from one cutting edge to next. A file with short pitch will have more spirals than file with longer pitch.

Rake angle: on perpendicular sectioning of a file angle which leading edge form with radius of file is known as rake angle.

Helix Angle: It is the angle the cutting edge forms with long axis of file.

Classification of Endodontic Instruments

Classification of endodontic shaping instruments.

Group I : Hand - Operated endodontic instruments

1. Barbed broaches & rasp.
2. K-type reamers & files.
3. Hedstroem files

Group II : low speed stainless steel endodontic instruments with latch-type attachments

1. Gattes- Glidden drills
2. peeso reamers.

Group III : Ultrasonic & sonic instruments

Group IV : Engine-driven nickel-titanium endodontic instrument

1. Rotary instrumentation
2. Reciprocating instrumentation
3. canal adaptive instrumentation

a) self adjusting file (SAF)

b) XP- endo shaper & finisher.

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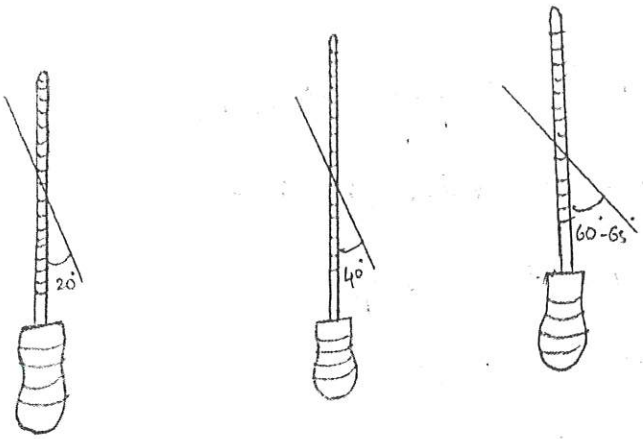

Various Filing motions

Endodontic hand instruments can be employed in any one of following motions:

Reaming: The instrument is used with a clockwise rotating pushing motion. limited to a quater - to half-turn & disengaged with a mild pulling motion when bound.

Filing: Filing indicates a push-pull motion with instrument. The instrument is placed into canal at desired length, Pressure is exerted against canal wall, & rare of flutes rasp the wall as instrument is withdrawn without turning pressure is maintained throughout procedure

watch winding: The instrument is reciprocated back & forth in clockwise-counterclock wise motion & than retracted for more debris.

circumferential filing:

following cleaning & shaping of root canal with a small reamer & reaming the root apex the same size file is inserted into root canal to apex, laterally pressed against one side of canal wall & withdrawn with pulling motion to file dentinal wall. The file is reinserted & procedure known as circumferential filing.

Anticurvature filing: This motion was described by abarrans & Jostrab. The furcal wall of canals in mesial root of molars is prone to prevent this error of anticurvature filing is advocated where in top of the handle of instrument is pulled into curvature while the shank end of handle is pushed away from the inside of curve. This motion balances the cutting flutes against part of root canal.

Schilders Objectives of Cleaning & Shaping

Mechanical Objectives:

should have a continuous tapering, conical shape, with the narrow cross-sectional diameter apically & widest diameter coronally

The walls should taper evenly toward apex & should be confluent with access cavity.

To give the prepared root canal the "quality of flow" shape that permits plasticized gutta-percha to flow against walls without impedance.

Should keep the apical foramen.

Biological objectives:

- Confinement of instrumentation to root themselves.
- Ensuring that necrotic debris are not forced beyond foramen.
- Removal of all tissues from root canal space.
- creation of sufficient space for optimal obturation of radicular space.

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step back techninque (Draw diagram)

In the step back preparation of root canal the canal is enlarged first in the apical 3rd to at least ano 15 or 30 instrument & then each consecutively larger root canal instrument is used for shaping the middle third & coronal part of root canal.

1. cleaning & shaping of root canal begins on completion of gross debridement & determination of exact working length.
2. The size 10 file followed by size is file is inserted direcs through the canal orifice to deserved length. The file is engaged against the dentinal wall with lateral pressure a is withdrawn.
3. The apical third is serially enlarged to develop an apical stop of size 25 file.
4. The next stage is step-back preparation which achived by increasing the size of files & by decreasing the length to produce coronal taper
5. To prepare the body of a canal each sequentially larger file is inserted until it makes unforced contact with the walls of canal & the walls are filed circumferentially once at this recco length.
6. The patency of apical canal segment which has been enlarged to size 25, must be ensured by continued use of this file after each step back.

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7. Circumferential filing using the master apical file can be used to smooth out & further refine the steps created by step back.

This preparation allows an adequate amount of coronal space in root canal for lateral compactions.

8. All instrumentation is performed in combination with copious irrigation to prevent blockage of canal with dentinal or pulp debris, but cautiously to prevent forcing of irrigating solution beyond the apical foramen.

9. Instrumentation is finished when walls are smooth clean when preparation shows continuous taper in an apical direction.

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Crown Down technique (Draw Diagram)

The concept of first instrumenting the coronal third of root canal before apical shaping was first advocated by Goerigetal:

Crown Down (step-down) technique:

1. patency of canal is first established with a size 8 or 10k file.
2. This procedure involves the pre paration of coronal two thirds of canal using Hedstroem files of six #15, #20, #25 to a working length depth of 16-18 mm or to point where the file start binding
3. This is followed by flaring the coronal segment of canal with the help of gates-Glidden drill was 2 & 3 sometimes No. 4 with each drill being used sequentially shorter. Care should be taken in directing gates drills away from the furcation to avoid strip perforation
4. The next phase involves apical instrumentation with smaller size 10 or 15 k file followed by working length determination.
5. A large file is then placed in canal to level of binding the canal is instrumented using watch winding motion ontill resistance is encountered.
6. The process is repeated with sequentially smaller files Ontil the working length is reached.

7. The apical portion of canal is now enlarged to appropriate MAF size which would vary from canal to canal & from tooth to tooth.

8. The final canal taper is accomplished by the MAF used in a circumferential filling motion.

Modifications:

The three modifications of this technique are as follow

1. Crown - down pressureless technique
2. Double - flare technique.
3. Balanced force technique

Advantages:

1. Shaping of canal is subjectively easier than step-back technique.
2. The removal of coronal obstruction allows removal of bulk of tissue, debris & microorganism before apical shaping.
3. This technique minimizes extrusion of debris through apical foramen, thereby preventing post operative.
4. It allows better access & control over apical enlarging instrument thus decreasing incidence of zipping.
5. allows better penetration of irrigants
6. working length is less likely to change while employing this technique.

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DESCRIBE VARIOUS IRRIGATING SOLUTIONS

It is important to appreciate that while hand & rotary instrumentation produce shape, it is the glidingly irrigant that clean & disinfect root canal system.

Irrigant not only are important for removal of debris & dentinal chips produced during shaping & cleaning but also are of critical importance in eradicating intraradicular or microbial infection.

Classification of root canal irrigants:

- Most commonly used irrigant
  - sodium hypochlorite ($NaOCl$)
  - Ethylendiaminetetra acetic acid (EDTA)
  - chlorhexidine digluconate (CHX)
- other recently introduced irrigants.
  - 1-hydroxyethylidene-1,1-bisphosphonate & also called as Etidronic acid
  - Iodine potassium Iodide (IKI)
  - Antibiotic containing irrigants
    - MTAD
    - Tetraclean
  - QMIX

Objectives of irrigation:

- Remove debris created during shaping of root canal
- lubricate root canal.
- Dissolve organic & inorganic tissue.
- Remove & prevent formation of smear layer.

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Ideal requirements of an endodontic irrigant

- Anti microbial activity.
- Mechanical flushes out debris from root canal.
- Nontoxic & non irritating to periapical tissue
- Dissolves necrotic & vital pulp tissue.
- serves as lubricant
- Easy to use & economical

Most commonly used irrigants:

- Sodium Hypochlorite: sodium hypochlorite a reducing agent is a clear straw colored solution containing about 5% of available chlorine. It is most widely used irrigating solution.

History: Dakin (1915): recommended 0.5% NaOCl for treating wounds during world war I

Coolidge (1919): Introduced NaOCl in endodontics

Mechanism of action:

NaOCl on ionization produces hypochlorous acid & hypochlorite ion. These are responsible for antimicrobial activity of NaOCl.

Destruction of bacteria take place in two phase.

1. penetration into bacterial cell wall.
2. chemical combination with protoplasm of bacterial cell & destruction of DNA synthesis.

Acc. to estre la ct mechanism of action of sodium hypochlorite

1. saponification reaction
2. amino acid neutralization
3. hypochlorous acid formation
4. chloramination reaction

∴ High alkaline pH → 11

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DESCRIBE VARIOUS IRRIGATING SOLUTIONS

The pulp dissolving ability of this irrigant is useful during the cleaning & shaping of inaccessible areas such as isthmus region & C-shaped canal.

Draw back of NaOCl:

It does not remove the inorganic component of endodontic smear layer.

It has an unpleasant taste.

The soln should be kept in cool place away from sunlight.

Ethylendiaminetetro acetic acid (EDTA):

The chelating agent ethylenediaminetetra acetic acid commonly called EDTA was introduced into endodontic practice by Atggard-Selby.

Mechanism of Action:

17% EDTA is relatively nontoxic & only slightly irrigating in weak solution. It form highly stable soluble, metal chelates in combination with heavy metals ion alkaline earth ions. EDTA functions by forming a calcium-chelate solution with Ca ions of dentin there by becomes more friable & easier to instrument

- EDTA is effective in softening dentin.
- irrigation with EDTA remove inorganic part of smear layer.
- The extent of demineralization by EDTA is proportional to exposure time.
- when it is difficult to introduce a file into canal due to intracanal calcification or iatrogenic blockage, EDTA gel can be used & one should try to negotiate such canals with instrument coated with EDTA gel.

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- Root canal of posterior tooth is narrow & if one risks breaking active instrument, it is better to pump EDTA into canal & wait for 1 min before attempting instrumentation.

Chlorhexidine Digluconate (2%):

Chlorhexidine digluconate (CHX) is a cation bisbiguanide which is utilized as irrigating soln as well as an intracanal medicament. The structure consist of two symmetric four-chlorophenyl rings & two bisguanide group held together by central hexamethylene chain. It is less toxic compared to other commonly employed irrigants.

Mechanism of action:

CHX possess a broad spectrum antimicrobial activity against most commonly endodontic pathogens. It also possess bacteriostatic & bactericidal activity. 2% CHX is capable of electrostatically binding to negatively charged bacterial surface. The antimicrobial activity of CHX against gram-positive bacteria & yeast is attributed to its ability to permeate the microbial cell wall & cause coagulation of cytoplasmic components.

Limitations:

- CHX lack tissue dissolving ability
- It does not remove smear layer & hence has to be employed in conjugation with other irrigants.

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MENTION VARIOUS INTRA CANAL MEDICAMENTS
WRITE IN DETAIL ABOUT CALCIUM HYDROXIDE

Commonly recommended Intracanal medicaments

- calcium hydroxide
- chlorhexidine digluconate
- Antibiotic
  - Triple antibiotic paste
  - Double antibiotic paste
- steroids
  - Ledermix

1. Calcium hydroxide:

Calcium hydroxide $Ca(OH)_2$ has been used by endodontist through out the world since Hermann introduced it to dentistry in 1920.

Mechanism of action:

It is highly alkaline substance with a pH of approx 12.5 $Ca(OH)_2$ has antibacterial properties & has ability to induce repair & stimulate hard tissue formation. The bactericidal effect is countered by its highly alkaline pH. The release of hydroxyl ions in an aqueous.

Hydroxyl ions are highly oxidizing free radicals that destroy bacteria by.

- Damaging the cytoplasmic membrane.
- proteins denaturate.

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Grossman's requirement of an ideal root canal medicaments:

- It should be an effective antimicrobial agent
- It should be non irritating to periradicular tissue.
- It should remain stable in solution.
- It should be active in presence of blood, serum & protein derivatives of tissue
- It should have low surface tension.
- It should not stain tooth structure
- It should not induce a cell mediate immune response.

Define & Mention objectives of obturation

obturation: According to american association of "obturation is the method used to fill & seal a cleaned & shaped root canal using a root canal sealer & core filling materials.

Grossman's requirements for an ideal root canal filling material.

- It should seal the canal laterally as well as apically.
- The material should be easily introduced into root canal.
- It should not shrink after being inserted
- It should set slowly
- It should be impervious to moisture
- It should be bactericidal or at least should discourage growth of bacteria.
- It should be sterile or easily, quickly sterilized immediately before insertion.
- It should be easily removable from root canal if necessary.

Obturating materials.

A. Gutta percha - The material used most often.

Friedman's composition: 20% gutta percha (Matrix)

66% Zinc oxide (filler)

10% heavy metal sulfate

5% waxes or resins - plasticizer.

B · Resilon

C. MTA (Mineral trioxide aggregate).

* objectives / criteria for obturation..

1. The canal should be reasonably dry with no fluid. in form of bleeding (or) discharge of serous fluids.

2. The optimal shaping & cleaning of canal can be easily achieved in tooth with vital pulp tissue.

3. failure of treatment is common in teeth with pre-existing periodicular radiolucency than in teeth with no periradicular changes

4. In a multi sitting root canal therapy case, care should be taken to ensure that there is no break down (or) leakage of temporary filling material during obturation visit.

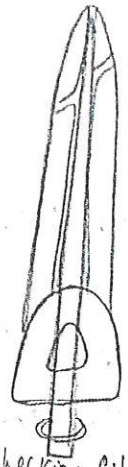
various obturation techniquies

Techniques of obturation:

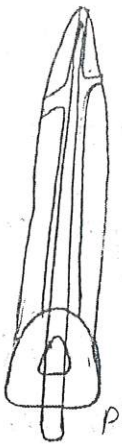
1. cold lateral compaction
   a single-cone obturation technique.
2. warm compaction (warm gutta-percha)
   a. warm vertical compaction technique.
   b. warm lateral compaction technique.
3. continuous wave compaction technique
4. Thermoplasticized gutta-percha injection
5. Mespadden thermo mechanical compaction.
6. carrier-based gutta-percha
   • Thermafil thermoplasticized
   • simplifil sectional obturation
7. Chemically plasticized gutta-percha
8. Custome cone.

lateral condensation technique

Root canal after completion of cleaning & shaping

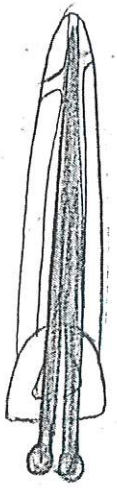


Checking fit of spreader to be within 1mm of working length

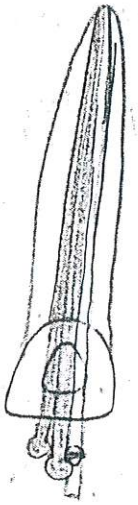


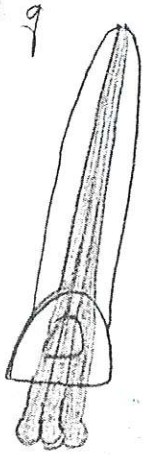
placement of master cone

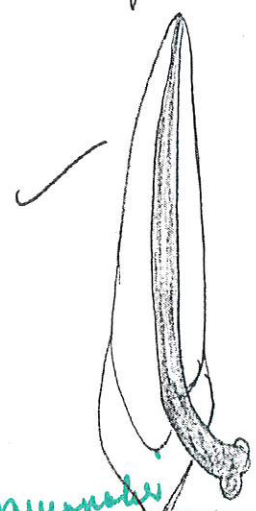
Placement of spacer along master cone to a length 1mm short of master cone to compact apical part of cone.



Lateral compaction of additional cone sequentially







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Lateral condensation

Isolation & drying the canals with paper points → selection of mastercone (Same size of master apical file) → checking for apical 'TUG BACK'

Verification of master cone fit

- Radiographic
  - Inadequate fit - beyond apex
  - ↓
  - Beyond the apex
  - ↓
  - If master cone extends beyond working length the tip should be cutt off so that reinserted primary cone fits at working length or next larger size gutta percha cone is inserted
- At working length
- Inadequate fit
  - Short of apex
  - ↓
  - Short of apex
  - ↓
  - If the initial fit is short of working length the patency has to be established to corrected length followed by sequential irrigation recapitulation & shaping of canal to master apical file size.

↓

Scalar manipulation & coat the canal with sealer using master cone.

↓

Master cone inserted till working length & hand or finger spreader is inserted along side master cone to a level 1 mm short of working length.

↓

The spreader is disengaged from cone by rotating in b/w fingertips or by rotating handle in arc.

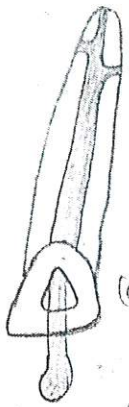
↓

Placement of sequential accessory cones by lateral compaction until complete obturation of radicular pulp space.

↓

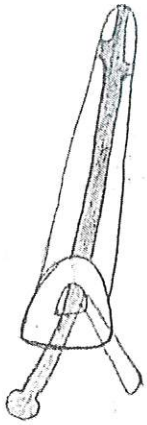
post obturation radiograph.

warm vertical compaction



(a)

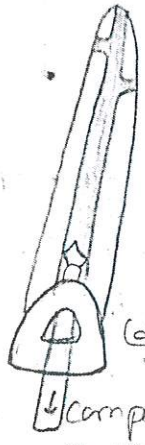
Master cone adaptation in prepared root canal



(b)

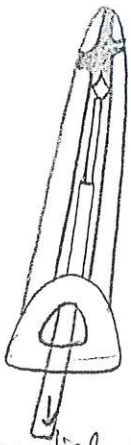
(c)

revisiting of coronal portion of master cone with heated instrument



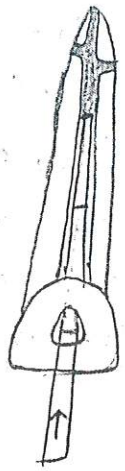
(d)

compaction of master cone

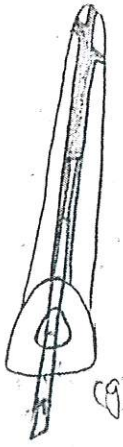


(e)

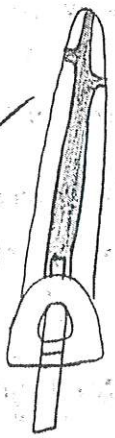
sequential segments removed with heat carrier followed by compaction



(f)



(g)



(h)

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Warm Vertical Compaction

Principle:

The warm vertical condensation or warm guttapercha technique of filling root canal was introduced by Schilder with objective of filling main root canal as well as lateral & accessory canals using heated pluggers, one applies poressure in a vertical directions to fill entire lumen of canal.

Technique:

The steps in warm vertical compaction are as follows.

1. A primary non standardized or greater taper gutta percha cone corresponding to last instrument used to fitted in canal in usual manner.
2. The canal walls coated with thin layer of root canal sealer.
3. The primary guttapercha cone/master cone is inserted upto working length.
4. The coronal end of cone is cut off with heated Instrument.
5. warm vertical compaction technique can be divided into clinical steps.

Step 1: Down packing:

A 'heat carrier' such as root canal plugger is heated to reduce & is immediately pushed into 3-4 mm of coronal 3rd of gutta percha.

- The heat carrier is deactivated & removed after a pause of 2-3 seconds inside the canal. The softened gutta-percha

gets removed along with heat carrier.

- The heat carrier is now again activated & placed to further distance of 3-4 mm into remaining gutta percha. This is again followed by pausing & removing another segment of gutta percha.

- This process of down processing compacting of thermoplastized gutta percha seperatly using alternative application of heat carrier & condenser is repeated untill smallest plugger compacts with gutta percha to 5mm from working length care should be taken to not remove apical 5mm of gutta percha during the down-procedure.

Step-2 Back filling:

- Once the down packing is completed the next step is to fill remaining canal with thermoplasticized gutta-percha. This can be achieved in two ways.

Schilder techniques: The remaining portion of canal is plugged with additional pieces of gutta-percha that is located with heat carrier & then compacted with approx size pluggers.

Thermoplastic back fill techniques:

This can be achieved with devices that heat gutta percha to a specific temp & allow operator to extrude the thermoplastic gutta-percha into canal apico-coronally. once you fill 3-4 mm of canal, back fill devices is removed & plugger is used in compact gutta-percha.

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Thermoplasticized Gutta percha technique

principle:

This technique comprises a pressure apparatus consisting of insulated electrically heated syringe barrel & a selection of needles ranging from 18 to 25 gauge size - plunger is designed to prevent backward flow of gutta percha.

Technique:

- The thermoplastic backfill systems are used in this technique - They are heat gutta-percha to 200C. The canal preparation is similar to any other technique. After drying canals sealer is coated onto canal walls.

- The injection method the canals preparation is restricted apically with flaring of body of canal toward access opening

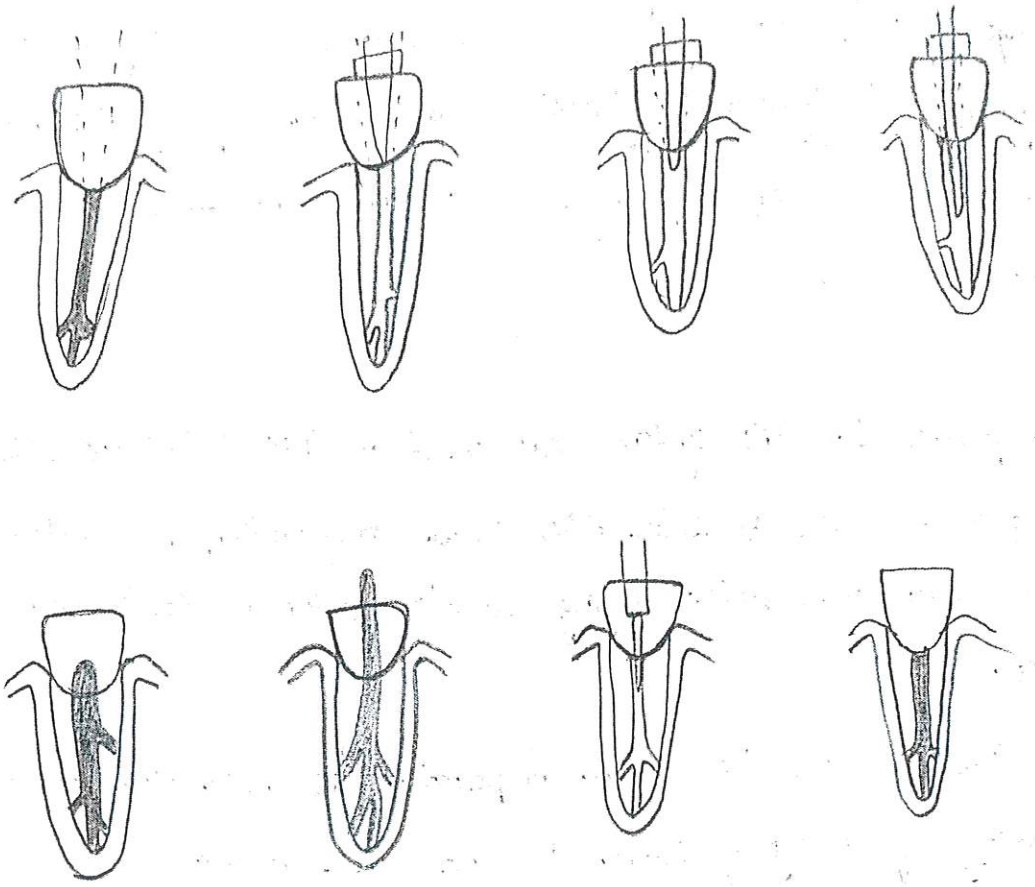
- Torabinajed & collegues found that injection of plasticized gutta-percha from pressure syringe produced satisfactory obturation as compared to cold lateral compaction.

Limitations:

- One common defect in all injection techniques is lack of precision in delivering gutta-percha a near the apical foramen & not beyond. through it may fill canal laterally in all its interstices.

- The injection technique relives on heated & plasticized gutta percha to flow apically with minimal compression when compared to force (or) pressure is used in lateral & vertical

compaction:



ENDODONTIC SEALERS

Root canal sealer:

Root canal sealer are used in conjugation with biologically acceptable semisolid or solid obturating material to establish an adequate seal of root canal system.

classification:

commonly used sealers

1. zinc-oxide-eugenol-based sealers
2. Epoxy resin-based sealer
3. calcium silicate based sealers.

Other available sealers

1. calcium hydroxide sealers
2. silicone sealers
3. glass ionomer-based sealer
4. other resin-based sealer
5. Medicated sealers.

Grossman's criteria for an ideal root canal sealer:

1. provide an excellent seal when set
2. Be radiopaque
3. Be dimensionally stable
4. Be non staining
5. Be easily mixed & introduced into canal
6. Be insoluble in tissue fluids.
7. Be non irritating to periradicular tissues
8. Be slow setting to ensure sufficient working.

1. Zinc oxide Eugenol Based sealers:

- They have long history of having been used successfully in endodontics
- Grossman's Cement; Roth's rot Sealer
- Rickert's sealer: pulp canal sealer

- Grossman's cement hardens in approx 2 hrs at 37°C & 100% relative humidity.

2. Epoxy Resin - Based sealers:

AH26 is an epoxy resin containing a nontoxic hardner radiopacity is imparted to it by bismuth oxide. It has strong adhesive properties, contracts slightly while hardening.

Advantage: 1. Good sealing ability
2. biocompatibility to periapical tissue.
3. Moderate antimicrobial activity.
4. Dentinal adhesion.

3. Calcium silicate - Based Sealers:

Tricalcium silicate is one of main components of MTA & is now focus of new generation of ceramic sealers.

Ie example of popular calcium silicate sealers are.

BioRoot Ros: Composition - zirconium oxide, dicalcium silicate tricalcium silicate calcium phosphate monobase, calcium hydroxide, filler & thickening agent

Total fill Be Sealer:

Composition - Powder: Tricalcium silicate, zirconium oxide
Liquid: Aqueous Sol of calcium chloride & polycarboxylate.

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WHO clasification & Traumatic injuries

Ellis & Davey classification (1960):

1. class I Enamel fracture
2. class II Enamel & dentin fracture without pulp exposure.
3. class III fracture involving enamel, dentin & pulp
4. class IV non vital
5. class V Avulsion.
6. class VI Root fracture without involvement of crown structure
7. class VII Displacement of tooth without fracture of crown.
8. Class VIII loss of crown & mass
9. class IX Trauma to deciduous teeth.

Andreasen's modified classification of soft tissue & bony injuries:

1- Laceration of gingiva or oral mucosa: A shallow or deep wound in mucosa resulting from a tear, usually produced by sharp object

2- Contusion of gingiva or oral mucosa: A bruise usually produced by impact with blunt object & not accompanied by break in mucosa, usually causing submucosal hemorrhage.

3- Abrasion of gingiva or oral mucosa: A superficial wound produced by rubbing or scraping of mucosa leaving a bleeding surface

4. Fracture of mandibular/Maxillary alveolar socket wall: A fracture of alveolar process which involves the alveolar socket.

5. Fracture of mandibular/maxillary alveolar socket wall: A fracture of alveolar process may/maynot involve socket.

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6. Fracture of mandible / maxilla: A fracture involving the base of maxilla / mandibles & often alveolar process.

These kind of fracture may / may not involve alveolar socket.

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ENDODONTIC MISHAPS

The scope of endodontics surgery has extended beyond root end resection to include other forms of periradicular surgery - fistulative surgery, corrective surgery & intentional replantation.

Indications:

1. failure of non surgical endodontic treatment.
2. failure of previous surgery.
3. Anatomical problem.
4. Iatrogenic error.
5. periodontal considerations.

Contraindications:

1. Inadequate periodontal support & active uncontrolable periodontal disease.
2. poor restorability with a past endodontic restorations.
3. Systemic complications of patients such as bleeding disorders, severe heart disease such as a patient recuperating from myocardial infarction & immunocompromised patients.
4. practitioners skill & experience with microsurgical treatment plays an important role.

Stages in surgical endodontics:

Mandatory Investigations prior to surgery.

- Bleeding time
- Clotting time
- Prothrombin time
- Activated partial thromboplastin time
- Partial

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- disease with defective coagulation - Haemophilia
- Thrombocytopenia.

Steps in endo surgery

Case diagnosis
↓
Preoperative surgical notes
↓
Anesthesia / hemostasis
↓
Management of soft & hard tissues
↓
Surgical access or osteotomy.
↓
periradicular curettage
↓
Access to root surface
↓
Root end resection
↓
Root end preparation
↓
Root end filling
↓
Soft tissue repositioning & suturing
↓
post surgical care.

Endodontic micro surgery:

- Magnification
- Illumination
- Instruments

Guttman's classification of endodontic surgery:

1- Fistulative surgery
   a- Incision & drainage
   b. Cortical trephination
   c. Decompression procedure.

2- periradicular surgery
   a- Curettage
   b- root end resection
   c- Root end preparation
   d Root end filling.

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ENDODONTIC SURGERY

1. Corrective surgery:
   a. perforation repair
      i. Mechanical
      ii. Resorptive
   b. periodontal management
      i. Root resection
      ii. Tooth resection
   c. Intentional replantation.

II. Kim's classification of microsurgery cases:

Class A: Represents a tooth with no periradicular lesion, no mobility, & normal pocket depth. The clinical symptoms have not resolved, although nonsurgical options have been exhausted. Clinical symptoms are indication for surgery.

Class B: Represents a tooth with a small periradicular lesion with clinical symptoms. The tooth has normal periodontal probing depth & no mobility. The teeth is in this class are ideal candidates for microsurgery.

Class C: Represent a tooth that has a large periradicular lesion progressing coronally without periodontal pocket & mobility.

Class D: Represents a tooth that is clinically similar to that in class C, but has deep periodontal pockets.

Class E: Represents a tooth ~~that~~ has a large periradicular lesion with an Endodontic-periodontal communication to the apex, but no obvious fracture.

Class F: Represents a tooth with an apical lesion & complete destruction of buccal plate, but no mobility.

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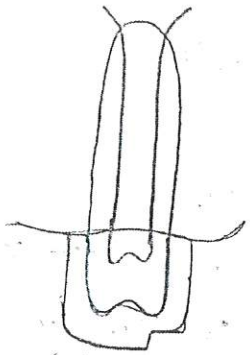
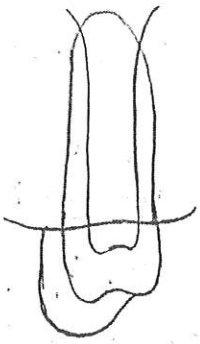
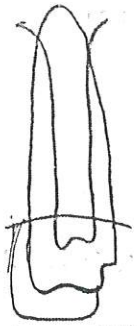
Ellis & Davey classification



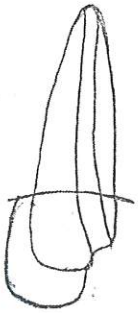
class I



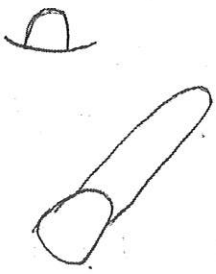
class II



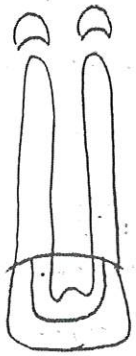
class III



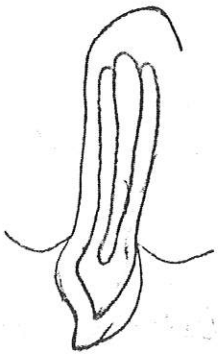
class IV



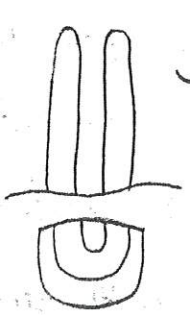
class V



class VI



class VII



class VIII

class IX

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CAVITY PREPARATION & RESTORATION ON PATIENTS

Date	Tooth Number & Exercise.		Cavity Preparation	Base & Matrix	Restoration
23/4/2022 Krishna Arun Kumar. 228107	Tooth Number: 6 Exercise: class I cavity preparation in 6 GIC restoration done in 6	Grade	B+	–	B+
		Signature		–	
13/9/2022 prasad 222568	Tooth Number: 76/7 Exercise: class I cavity preparation in 76/7 GIC restoration done in 76/7	Grade	B+	–	B+
		Signature		–	
20/9/22 Krishnaveni	Tooth Number: 123 Exercise: cervical abrasion restoration with GIC Done	Grade	B+ –	–	B+
		Signature	–	–	

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CAVITY PREPARATION & RESTORATION ON PATIENTS

Date	Tooth Number & Exercise.		Cavity Preparation	Base & Matrix	Restoration
20/9/2022 Ganesh	Tooth Number : ~~|67~~ Exercise : Class I cavity preparation irt ~~|67~~ composite restoration done irt ~~|67~~	Grade	B+	–	B+
		Signature		–	
23/9/2022 Bheemanna	Tooth Number : ~~76|~~ Exercise : Class I cavity preparation & GIC restoration done irt ~~76|~~	Grade	B	–	B
		Signature		–	
26/9/2022	Tooth Number : ~~7~~ |7 Exercise : class I cavity preparation, GIC & composite restoration done irt ~~7~~ |7	Grade	B	B	B
		Signature			

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CAVITY PREPARATION & RESTORATION ON PATIENTS

Date	Tooth Number & Exercise.		Cavity Preparation	Base & Matrix	Restoration
28/9/2022 Naveen kumar	Tooth Number : 16 Exercise : class I cavity preparation & clical, GIC restoration (Direct pulpcapping) is done in 16	Grade	(B)	(B)	(B)
		Signature			
	Tooth Number : Exercise :	Grade			
		Signature			
	Tooth Number : Exercise :	Grade			
		Signature			

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OOT CANAL TREATMENT ON SINGLE ROOTED EXTRACTED TOOTH

Maxillary central Incisor

		Staff signature
perative radiograph (Diagnostic)		
ss cavity & pulp extirpation		
orking length determination (Ingle's technique)		
- Pre - operative radiographic length of tooth	26 mm	
afety measure (minus 1mm)	25 mm	
entative working length	25 mm	
ize of root canal file	15 K- file	
eference point	incisal edge	
After taking radiograph with instrument and if instrument is short by 1.5 mm, add 1.5 mm & Viceversa	25 mm	
- Adjustment for apical termination (minus 1mm)	25 mm	
inal Working length	25 mm	
mechanical preparation (master apical file)	55 K file	
ep - back preparation (yes /no)	yes	
	(size)	
lection of guttapercha master cone & confirmation radiograph	55 (size)	
Obturation (lateral condensation technique)		
nal post obturation radiograph		
t Endodontic Restoration.		

Date of Completion 10/9/22

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ROOT CANAL TREATMENT ON SINGLE ROOTED EXTRACTED TOOTH

Maxillary Premolar

		Staff signature
	-operative radiograph (Diagnostic)	
	ss cavity & pulp extirpation	
	king length determination (Ingle's technique)	B, P
	e - operative radiographic length of tooth	21 21 mm
	afety measure (minus 1mm)	20 20 mm
	- Tentative working length	20 20 mm
	Size of root canal file	15 15 K-file
	eference point	Buccal cusp tip, palatal asp tip
	fter taking radiograph with instrument and if	20 mm
	strument is short by 1.5 mm, add 1.5 mm & Viceversa	
	djustment for apical termination (minus 1mm)	20 20 mm
	inal Working length	20 20 mm
	Biomechanical preparation (master apical file)	40 35 K file
	p - back preparation (yes /no)	Yes
		(size)
	tion of guttapercha master cone & confirmation radiograph	40 35 (size)
	ration (lateral condensation technique)	
7.	Final post obturation radiograph	
	Post Endodontic Restoration.	

Date of Completion 14/9/2022

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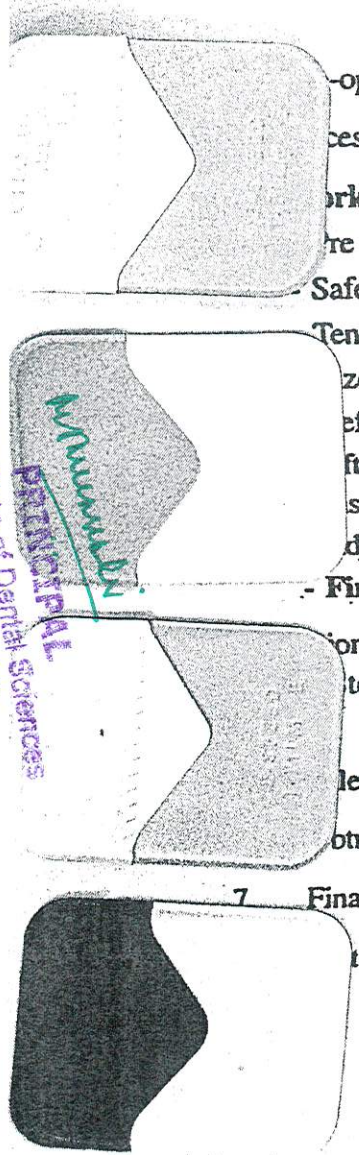
ROOT CANAL TREATMENT ON SINGLE ROOTED EXTRACTED TOOTH

Mandibular Molar-

		Staff signature
-operative radiograph (Diagnostic)		(B) ①
cess cavity & pulp extirpation	MB, ML, D	
rking length determination (Ingle's technique)		
re - operative radiographic length of tooth	20 20 19 mm	
- Safety measure (minus 1mm)	19 19 18 mm	
Tentative working length	19 19 18 mm	
ze of root canal file	08 08 15 K-file	
eference point	.....	
fter taking radiograph with instrument and if	..... mm	
strument is short by 1.5 mm, add 1.5 mm & Viceversa		
djustment for apical termination (minus 1mm)	19 19 18 mm	⑨
- **Final Working length**	19 19 18 mm	.....
omechanical preparation (master apical file)	35 35 55 K file	
tep - back preparation (yes /no)	Yes	⑨
	.....(size)	.....
lection of guttapercha master cone & confirmation radiograph	35 35 55 (size)	⑨ .....
bturation (lateral condensation technique)		⑨ .....
7 Final post obturation radiograph		⑨ .....
t Endodontic Restoration.		⑨ .....

Date of Completion 20/9/2022



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CAST METAL RESTORATIONS

The cast metal restoration is an indirect restoration that involves numerous steps & dental material with meticulous attention to detail.

- The class II inlay is an intra coronal cast metal restoration that involves the occlusal & proximal surfaces of posterior teeth.
- The partial onlay is a cast metal restoration that involves occlusal & proximal surface of posterior & covers & restores atleast one but not all cusp tips of posterior teeth.

Cast metal alloys: At present four distinct group of alloys are in use for cast restoration.

1. Traditional high gold alloys.
2. Low-gold alloys.
3. Palladium-silver alloy.
4. Base metal alloy (most commonly used).

Indications: 1. large restoration
2. Superior contact & contour.
3. Endodontically treated teeth
4. Dental Rehabilitation with cast metal alloys.

contraindications: 1. High caries rate
2. young patients
3. esthetics
4. small restorations.

Advantages

Strength
Biocompatibility low wear
Control of contour & contacts

Disadvantages

Number of appointments & chair time
Temporary restorations
Technique sensitivity
splitting forces.

Clinical steps in tooth preparation of class II inlay:

Initial preparation:

1. Occlusal steps :- step 1 : orienting the bur
   step 2 : occlusal punch cut
   step 3 : occlusal extension
   step 4 : Dovetail retention
   step 5 : Occlusal outline form.

2. proximal box :- step 1 : proximal ditch preparation
   step 2 : proximal box preparation
   step 3 : planing the walls
   step 4 : placement of retention grooves.

final preparation:

1. Removal of infected carious dentin & pulp protection.
   step 1 : Inspection.
   step 2 : Removal of infected caries.
   step 3 : Removal of old restorative material.
   step 4 : Pulp protection with Light cure GIC.
   step 5 : Lining with calcium hydroxide

2. preparation of bevel & flares :-
   step 1 : Preparation of occlusal bevel.
   step 2 : Bevelling the axiopulpal line angle
   step 3 : preparing secondary lingual flare
   step 4 : Bevelling gingival margin.
   step 5 : preparing secondary facial flare

I. Initial preparation :-

1. Occlusal steps:

Step 1 : orienting the bar : No-245 carbide bur is held parallel to long axis of tooth crown. The bur should be rotating at high speed before application to tooth & should not stop rotating until it is removed.

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step 2: occlusal punch out: enter the fossa (or) pit to involve marginal ridge using punchout to depth of 1.5 mm establish depth of pulpal walls.

step 3: occlusal extension: Maintaining 1.5 mm initial depth & same bur orientation, dentist extends preparation outline along central groove (or) fissure to include mesial fossa (or) pit.

step 4: Dovetail Retention: use slender 169L carbide bur to create facial & lingual extension into mesial pit region. There by creating desired dovetail retention from distal displacement of inlay.

step 5: occlusal outline form: use 271 carbide bur to extend occlusal step distally into distal marginal ridges.

- Increased faciolingual width enables facial & lingual walls of box to project perpendicular to proximal surface at positions that clear the adjacent tooth by 0.2 - 0.5 mm.

2. proximal step:

step 1: proximal ditch preparation: containing with no 2 → 1 carbide bur, distal enamel is isolated by cutting proximal ditch mesiodistal width of ditch should be 0.8 mm & prepared approx 2/3rd of expose of dentin & one third at exposed enamel.

step 2: proximal box preparation: with no. 271 carbide enamel make 2 cuts once at facial limit of proximal ditch & other at lingual limit.

step 3: planning the walls: planning distofacial distolingual & gingival wall is accomplished by hand instrument in order to remove all undermined enamel. Depending on access operator can use a bin angle chisel.

step 4: placement of Retention grooves:- shallow retention grooves may be cut in facioaxial & linguoaxial line angles with no. 1692 carbide.

- These grooves are indicated especially when prepared tooth is short.

II final preparation:

1. Removal of infected carious dentin & pulp protection:

step 1: Inspection: After initial preparation has been completed dentist evaluate internal walls of preparation visually & tactility for indication of any remaining carious dentin. If carious dentin remains & if it is judged to be infected but shallow (or) moderate satisfactory isolation for removal of which caries is done with use of cotton rolls, saliva ejector

step 2: Removal of infected caries:- A slowly revolving round bur (No 4/9) or spoon excavator is used to remove carious infected dentin.

step 3: Removal of old restorative materials:- In condition like old restorative material is judged to be thin, non retentive.

- Radiographic evidence of caries under old material is present
- pulp was symphomatic pre operatively.

step 4: pulp protection with light cure GIC:

- placing base takes little time & should be considered because it result in working dies that have preparation wall with no undercuts.
- Applying base at this time minimizes additional irritation of pulp during subsequent procedure necessary for completion of restoration.
- Light cure GIC adhere to tooth structure & doesnot require retentive undercuts when base is small to moderate.

step 5: Lining with calcium hydroxide:

- If the excavation closely approaches to pulp (or) direct pulpis indicated dentist should apply lining of $Ca(OH)$ using following techniques. calcium hydroxide. Line should cover & protect any possible (or) near exposure & extend over major portion of excavated dentinal surface.
- calcium hydroxide treatment of an exposed healthy pulp promotes formation of dentin bridge which should close the exposure.

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SRI VENKATA SAI INSTITUTE OF DENTAL SCIENCES

Appanapally, MAHABUBNAGAR - 509 001.

Affliated to NTR UNIV. OF HEALTH SCIENCES ANDHRA PRADESH.

DEPARTMENT OF ORAL AND MAXILLOFACIAL SURGERY

Certificate

This is to certify that Mr./~~Miss~~ ALAMURU PURNA CHANDRA REDDY *has completed the clinical exercises and training in Oral Maxillofacial Surgery prescribed by the NTR University of Health Sciences for B.D.S. course during the year* 2023 *to* 2024

Date: 21/12/2023

Univ. Regd. No.: 1902106006

Signature

Professor & H.O.D.

Dept. of Oral & . Maxillofacial Surgery

Department of Oral & Maxillofacial Surgery
SVS Institute of Dental Sciences
Mahabubnagar

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IV BDS DISCUSSION TOPICS

1) Day1 Case History and Clinical Examination
2) Day2 Sterilization & Asepsis
3) Day3 Techniques of Maxillary anaesthesia - I
4) Day4 Techniques of Maxillary Anaesthesia - II
5) Day5 Techniques of Mandibular anaesthesia - I
6) Day6 Techniques of Mandibular anaesthesia - II
7) Day7 Local Complications of LA
8) Day8 Systemic Complications of LA
9) Day9 Transalveolar Extraction & Elevators
10) Day10 Complications of exodontia
11) Day11 Surgical removel of impacted mandibular third molar
12) Day12 suture materials & Antibiotics
13) Day13 Fractures & Principales of Mangenment and wiring techiques
14) Day14 Biopsy
15) Day15 Analgesics & Antibiotics
16) Day16 Prescription Writing & IM, IV injections
17) Day17 Synscope, Anaphylaxis, Emergency durgs & Equipment
18) Day18 Medical Emergencies in Dental Office - I (Cardiovascular)
19) Day19 Medical Emergencies in Dental Office -II (Respiratory)
20) Day20 Medical Emergencies in Dental Office - III (Endocrine)
21) Day21 Medical Emergencies in Dental Office - IV (GIT & CNS)
22) Day22 Medical Emergencies in Dental Office - V (Renal & Organ transplant Patients)
23) Day23 Medical Emergencies in Dental Office - VI (Bleeding & Clotting discorders)
24) Day24 Medical Emergencies in Dental Office - VII (HIV and Hepatitis)

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WORK DONE

S.No	Date	OP.No.	Name	Age (Yrs)	Sex	Diagnosis	Procedure	Anaesthesia	Signature
1.	15/10/22	2228083	Balaiah	65	M	Chronic generalized periodontitis i.r.t 8 7 6 |	Extraction done ↓ LA (2% Lignocaine) i.r.t 8 7 6 |	• Buccal infiltration i.r.t 8 7 | • Greater palatine Nerve block	
2.	2/2/23	2228702	Kondanna	60	M	Chronic generalized periodontitis 8 5 | 8 |	Extraction done ↓ LA (2% Lignocaine) 8 |	• Inferion Alveolar Nerve block • Lingual Nerve block • Long buccal nerve block	
3.	4/2/23	222451	Narsingamma	35	F	Chronic generalized periodontitis	Extraction done ↓ LA 7 6 5 |	• Postsion superion alveolar nerve block • Middle superion alveolar nerve block • Greater palatine nerve block.	

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WORK DONE

No	Date	OP.No.	Name	Age (yrs)	Sex	Diagnosis	Procedure	Anaesthesia	Signature
1.	6/2/23	235077	NASEER KHAN	65	M	~~Ch~~ chronic generalized periodontitis	Extraction ↓LA (2/. ligature) 5 |	· Inferion Alveolar Nerve block · Lingual nerve Block · Buccal Nerve block	
5.	9/2/23	2229294	SUJATHA	48	F	Chronic generalized Periodontitis	Extraction ↓LA 8 7 6 |	· Inferion Alveolar Nerve block · Lingual Nerve block · Buccal Nerve block	
6.	17/2/23	236329	NARSIMULU	55	M	Chronic generalized Periodontitis	Extraction done ↓LA 4 |	· Buccal infiltration i.r.t 4 · Greater Palatine Nerve Block	
7.	20/2/23	237576	M·RAVI	49	M	Chronic generalized ginvitis with localized periodontitis i.r.t 7 |	Extraction done ↓LA 7 |	· Buccal infiltration i.r.t 7 · Greater Palatine Nerve Block ·	

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WORK DONE

S.No	Date	OP.No.	Name	Age (Yrs)	Sex	Diagnosis	Procedure	Anaesthesia	Signature
8.	21/2/23	2027847	NARSAMMA.	80	F	Chronic generalized periodontitis	Extraction done under LA 8765	• Buccal infiltration i.r.t 876 • Middle Superior Alveolar Nerve block • Greater Palatine Nerve block	[signature]
9.	23/2/23	238239	AIZAZ SULTHANA	57	F	Chronic irreversible pulpitis 76	Extraction done under LA 76	• Inferior Alveolar Nerve block • Lingual Nerve block • Buccal Nerve block	[signature]
10.	27/2/23	239203	G. ANNAPURNA	70	F	chronic generalized periodontitis	Extraction done under LA 4 7	• Inferior Alveolar Nerve block • Lingual Nerve block • Buccal Nerve block	[signature]

[signature]
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WORK DONE

No	Date	OP.No.	Name	Age	Sex	Diagnosis	Procedure	Anaesthesia	Signature
1.	28/2/23	239480	P. Rajeshwari	47Years	Female	Chronic generalized gingivitis with localized periodontitis i-n-t $\frac{+6}{}$ Chronic irreversible pulpitis i-n-t $\frac{3}{876\,7}$	Extraction done ↓ LA i-n-t $\frac{3}{876}$	• Inferior Alveolar Nerve block • Long buccal Nerve block • Lingual Nerve block	
12.	~~30~~/~~8~~/2023	2358431	Saraswathi	65years	Female	Chronic irreversible pulpitis i-n-t $\frac{2\,1}{62\,36}$	Extraction done ↓ LA i-n-t $\frac{}{36}$	• Inferior alveolar nerve block • Long buccal Nerve block • Lingual Nerve block	

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WORK DONE

S.No	Date	OP.No.	Name	Age	Sex	Diagnosis	Procedure	Anaesthesia	Signature
13.	31/10/23	2377227	Sunitha	32 years	Female	Chronic ~~ir~~reversible pulpitis ~~[illegible]~~ 6|5 68	Extraction done ↓ LA ~~[illegible]~~ 6|	• Anterior alveolar Nerve block • Long buccal nerve block • Lingual Nerve block	
14.	3/11/23	2377902	Som Bhupal	60 years	Male	Class II DC 4 Root stumps 6| CGP	Extraction done ↓ LA 6|	• Buccal infilteration 6| • Greater palatine Nerve block	
15.	21/12/23	2390393	Saheen Begum	32 years	Female	Chronic irreversible pulpitis 7 6|	Extraction done ↓ LA 7 6|	Anterior alveolar nerve block Long buccal Nerve block Lingual nerve block	

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12/23

③ TRIGEMINAL NERVE

The trigeminal nerve is so called because its three main branches ie Opthalmic, Maxillary and Mandibular Nerves.

- It is the largest of the cranial nerves
- It is the fifth cranial nerve
- It is the mixed nerve

It is sensory to the greater part of the scalp, the teeth, and the oral and nasal cavities

- Motor supply is to the Muscles of Mastication. Proprioceptive nerve fibres arise from the masticatory and extra-ocular muscles.

MOTOR ROOT:

It arises separately from the sensory root in the motor nucleus of pons. At the semilunar ganglion it passes inferolaterally under the ganglion towards for ovale through which it leaves the middle cranial fossa along with the mand. division. After it exits the skull, it unites with the sensory root and forms a single nerve trunk. It supplies the

1. Muscles of Mastication
2. Mylohyoid
3. Anterior belly of digastric
4. Tensor tympani
5. Tensor veli palatini

SENSORY ROOT:

The fibres of the sensory root arise from the cells of the trigeminal ganglion. The branches of the unipolar cells of the trigeminal ganglion are divided into central and peripheral branches.

- The central branches leave the concave surface to enter the pons.
- The peripheral branches are grouped to form the opthalmic and maxillary nerves and sensory part of the mandibular nerve.

THE TRIGEMINAL GANGLION

- Sensory root fibres of the trigeminal nerve comprise the central process of cells located in the trigeminal ganglion. Two ganglions one innervating each side of face located in meckle's cartilage cavity, on the anterior surface of the petrous portion of temporal bone.
  - It is cresentic/semilunar in shape.
  - Medially it is related to I.C.A and cavernous sinus, inferiorly with the motor root & the greater petrosal nerve and the apex of the petrous temporal bone & foramen lacerum.
  - Blood supply of the ganglion is through the ganglionic branches of the ICA & the accessory meningeal artery which enters through the foramen ovale.

Various nuclei assosiated with the fifth nerve are situated within the pons. They are

1. Motor nucleus
2. Sensory nucleus
3. Mesencephalic nucleus
4. Spinal nucleus.

The 3 Main divisions of the trigeminal nerve are;

V1 : opthalmic division
V2 : Maxillary division
V3 : Mandibular division.

OPTHALMIC NERVE :-

- It is the superior division of the V nerve & is the smallest
- Leaves the cranium and enters the orbit through superior orbital fissure.
- It is wholly sensory
- It has 3 branches. All 3 of them passes through the superior orbital fissure into the orbit. They are:

1. Lacrimal Nerve
2. Frontal Nerve
3. Nasocilliary Nerve.

1. LACRIMAL NERVE:

- It is the smallest. It supplies the lacrimal gland and the conjuntiva.
- It pierces the orbital septum and ends in the skin of the upper eyelid.

2. FRONTAL NERVE:

- It is the largest branch & appears to be the ~~first~~ direct continuation of the optholmic division. It enters the Orbit through the Superior Orbital Fissure divides into 2 branches:

(i) The supra orbital branch: It is larger & more laterally placed. It supplies the skin of the forehead & scalp as far back as the vertex. It also supplies the mucous membrane of the frontal sinus and pericranium.

(ii) The Supra trochlear branch: It is smaller and more medially placed. It curves upward on the forehead, close to the bone. It supplies the skin of the upper eyelid and lower part of the forehead.

3. NASOCILLIARY NERVE:

It is intermediate in size and runs more deeply. Its branches are divided as following:

(i) Branches in the orbit
(ii) Branches in the Nasal Cavity
(iii) Branches on the face.

(i) BRANCHES IN THE ORBIT:

(i) Long root of the ciliary ganglion: It is sensory & passes through the ganglion without synapsing and supplies the eyeball

(ii) Long ciliary nerve: Supplies the Iris & Cornea.

(iii) Posterior ethmoidal nerve: It enters the posterior ethmoidal canal & supplies to the mucous membra

lining of the ... air cells.

(iv) Anterior ethmoidal nerve: It supplies to the Ant. ethmoidal & frontal paranasal air cells.

In the upper part of nasal cavity, it further divides into:

(a) Internal nasal branches: supply nasal conchae & the ant. nasal wa[ll]

(b) External nasal branches: skin on the tip & ala of the nose.

(ii) BRANCHES IN THE NASAL CAVITY:

The branches arising here supply the mucous membrane of the nasal cavity.

(iii) TERMINAL BRANCHES ON THE FACE:

They supply sensory nerves to the skin of the medial parts of the both eyelids, the lacrimal sac. They also supply skin on the bridge of the nose.

MAXILLARY NERVE:-

- This is the second and intermediate division of the trigeminal nerve.
- It is wholly sensory
- COURSE: It begins at the middle of the trigeminal ganglion as a flattened, plexiform band, passes horizontally forwards along the lateral wall of the cavernous sinus.
  - It leaves the skull through the foramen rotundum & becomes more cylindrical & firmer in texture.
  - It crosses the upper part of the pterygopalatine fossa, inclines laterally on the posterior part of the orbital process of the maxilla and enters the orbit through the inferior orbital fissure.
  - It is now termed as the ~~infra~~ orbital nerve.

It passes through the infra orbital groove & canal in the floor of the orbit & appears on the face through

The branches of the maxillary nerve can be divided into the following 4 groups:

1) In the Cranium : Meningeal branch
2) In the pterygopalatine fossa: Ganglionic, Zygomatic, Post. superior alveolar nerve
3) In the infra orbital canal: Middle superior alveolar Nerve, Anterior Superior alveolar Nerve
4) On the Face: Palpebral, nasal, superior labial.

1) Branch given off on the cranium:

1. Meningeal branch: It is given off near the foramen rotundam. It supplies the duramater of the anterior and middle cranial fossae

2) Branches in the pterygopalatine fossa:

1. The Ganglionic branches: They connect the maxillary nerve to the pterygopalatine ganglion.
   - They contain secretomotor fibres to the lacrimal gl.
   - They provide sensory fibres to the orbital periosteum & mucous membrane of the nose, palate and pharynx.

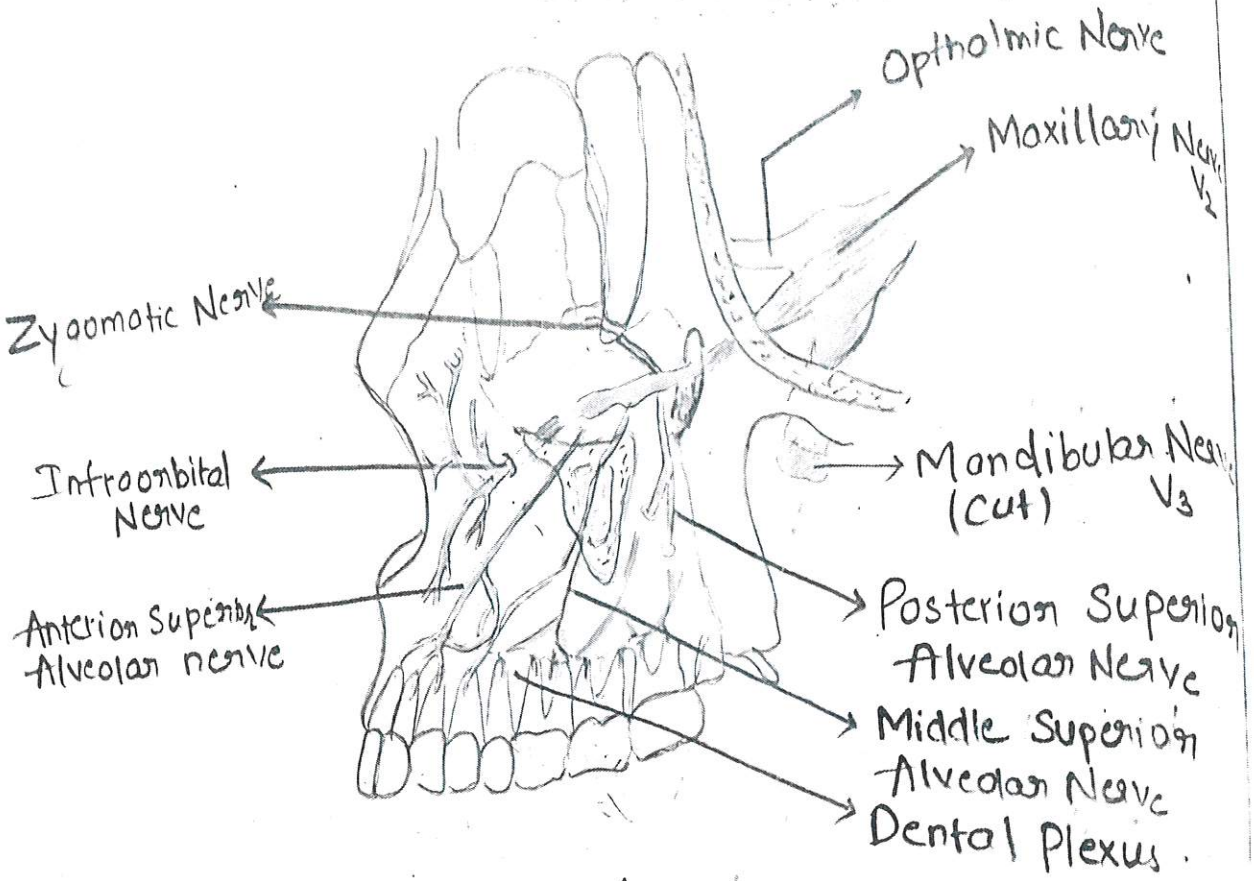
2. The Zygomatic Nerve,

It arises in the pterygopalatine fossa from the maxillary nerve and travels anteriorly, entering through the inferior orbital fissure where it divides into 2 branches
- Zygomaticofacial Nerve
- Zygomaticotemporal Nerve.

3. Posterior Superior Alveolar Nerve:

It begins in the pterygopalatine fossa but divides into 3 branches which emerge through the pterygomaxillary fissu 2 branches enter the posterior wall of the maxilla above the tuberosity and supply the molars (except the mesiobuccal root of the 1st Molar).

The third branch pierces the buccinator and supplies the adjoining part of the gingiva & cheek along the buccal side of upper molar teeth



- Lateral View of the skull (a portion of the lateral wall of the orbit has been removed) with the branches of the maxillary nerve highlighted

3) Branches in the intraOrbital canal (Intraorbital Nerve)

1) Middle Superior Alveolar Nerve:

It arises from the intra orbital foramen nerve & runs downwards and forwards along the intraorbital groove along the lateral wall of the maxillary sinus.

It divides into branches which supply the Maxillary premolars and mesiobuccal root of the first molar teeth.

2. Anterior superior alveolar nerve:

It also arises in the intraorbital canal near the midpoint.

It runs in the anterior wall of the maxillary antrum.

It runs inferiorly & divides into the branches, which supply the canines & incisors.

A nasal branch from the nerve, given off from the superior dental plexus supplies the mucous membrane of the anterior part of the lateral wall & floor of the nasal cavity.

It ends in the nasal septum.

4) Branches given on the Face:

1. The palpebral branches: They arise deep to the orbicularis oculi & and pierce the muscle, supplying the skin over the lower eyelid & lateral angle of the eye along with the zygomaticofacial & facial nerves.

2. The nasal branches:

They supply the skin of the nose & tip of the nasal septum and join the External nasal branch of the anterior ethmoidal nerve.

3. The Superior labial branches: These are large and numerous

They supply the skin over the anterior part of the cheek & upper lip including the mucous membrane & labial glands.

They are joined by the facial nerve & form the infraorbital plexus.

MANDIBULAR NERVE :

It is the third and largest division of the trigeminal nerve
It is made up of two roots:

→ Large sensory root which proceeds from the lateral part of the trigeminal ganglion & almost immediately emerges out from the foramen ovale

→ Small Motor Root which passes below the ganglion & unites with the sensory root just outside the foramen.

*Immediately beyond the junction of the sensory and motor roots, the nerve gives the meningeal branch and the nerve to the medial pterygoid. Now the main trunk divides into small anterior and a large posterior branch.

* As it descends from the foramen, the mandibular nerve lies at a distance of 4 cm from the surface & a little in front of the neck of the mandible.

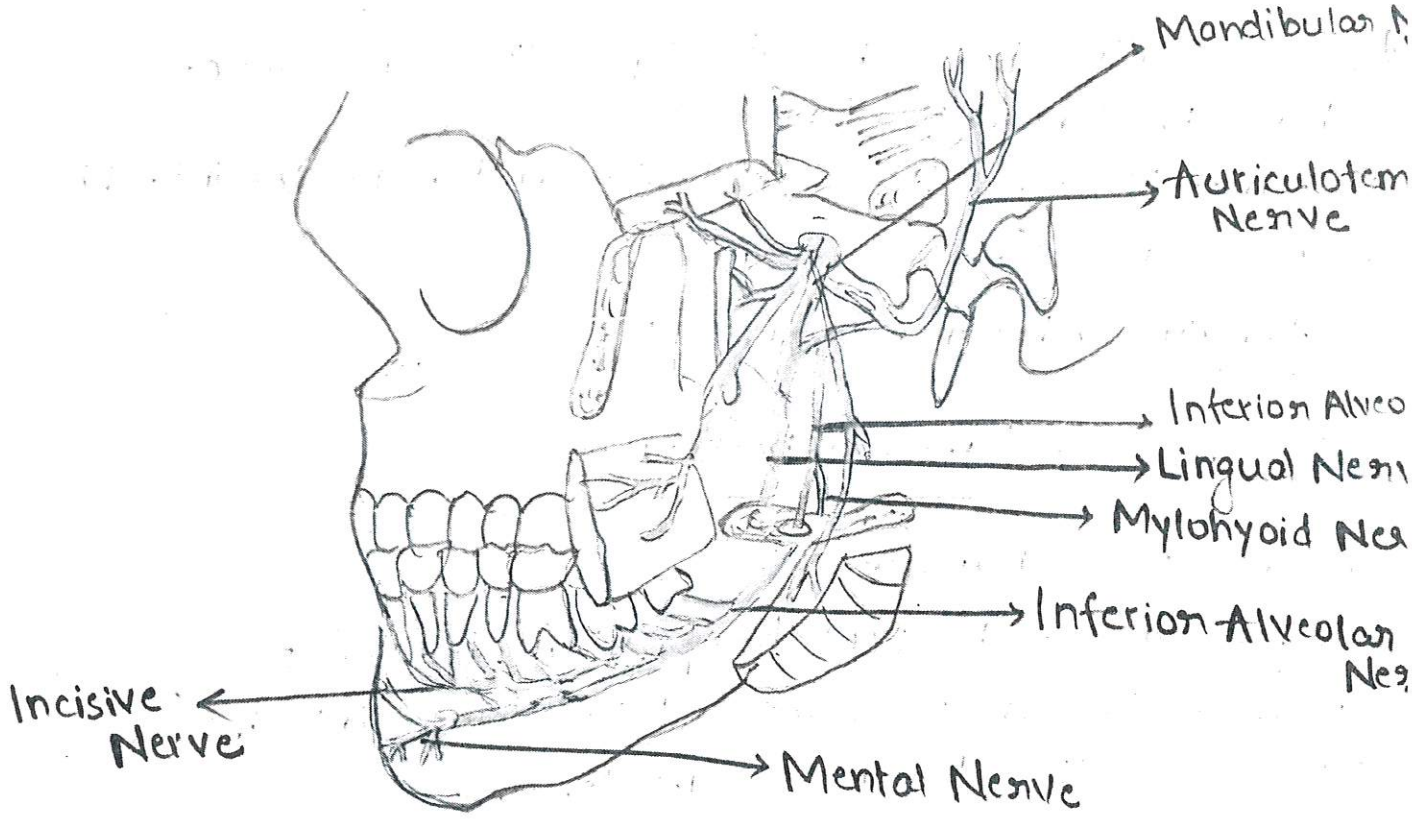
The branches of the mandibular nerve:

1. Branches from the undivided nerve:
   (i) Meningeal branch/ nervus spinosus
   (ii) Nerve to the medial pterygoid
2. Branches from the divided nerve:

(A) Anterior division:
   (i) Buccal nerve
   (ii) Massetric nerve
   (iii) Deep temporal nerve
   (iv) Nerve to the lateral pterygoid.

(B) Posterior division:
   (i) Auriculotemporal nerve
   (ii) Lingual nerve
   (iii) Inferior alveolar nerve

THE PATHWAY OF THE POSTERIOR TRUNK OF THE MANDI
NERVE OF THE TRIGEMINAL NERVE IS HIGHLIGHTED.



NEUROPHYSIOLOGY, MECHANISM OF ACTION OF LOCAL ANESTHESIA. (4)

Loss of sensation in a circumscribed area of the body caused by a depression of excitation in nerve endings (or) inhibition of the conduction process in peripheral nerves, no loss of consciousness occur.

Properties of local anesthesia: (Malamed).

1. It should not be irritating to tissue which it is applied.
2. It should not cause any permanent alteration of nerve structure
3. Its systemic toxicity should be low
4. Duration of action must be long enough to permit completion of the procedure yet not so long as to require an extended recovery.
5. It should be relatively free from producing allergic Reactions.
6. The time of onset of anesthesia should be as short as possible
7. It should be stable in solution & should readily undergo biotransformation in the body.
8. It should be sterile/ capable of being sterilized by heat without deterioration.

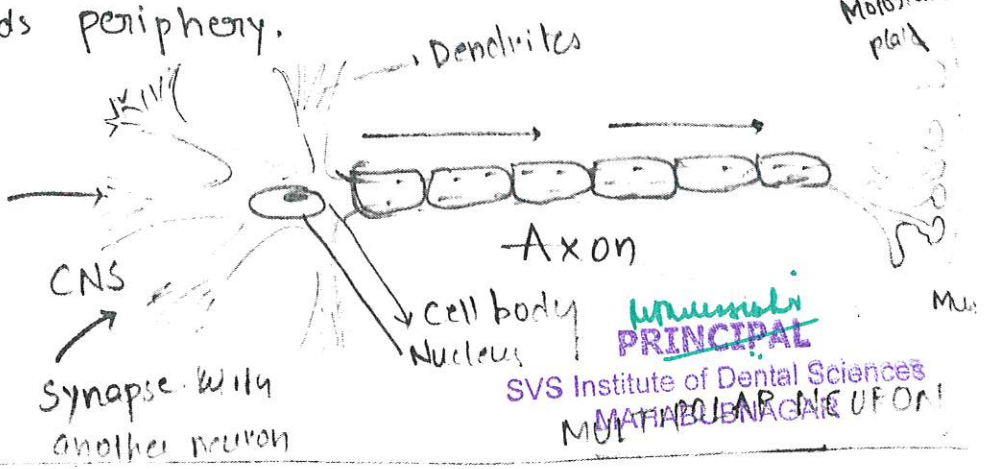
Fundamentals of impulse conduction:

→ They are 2 basic types of neurons.

→ They are sensory (afferent), motor (efferent) from CNS impulses conducted towards periphery.

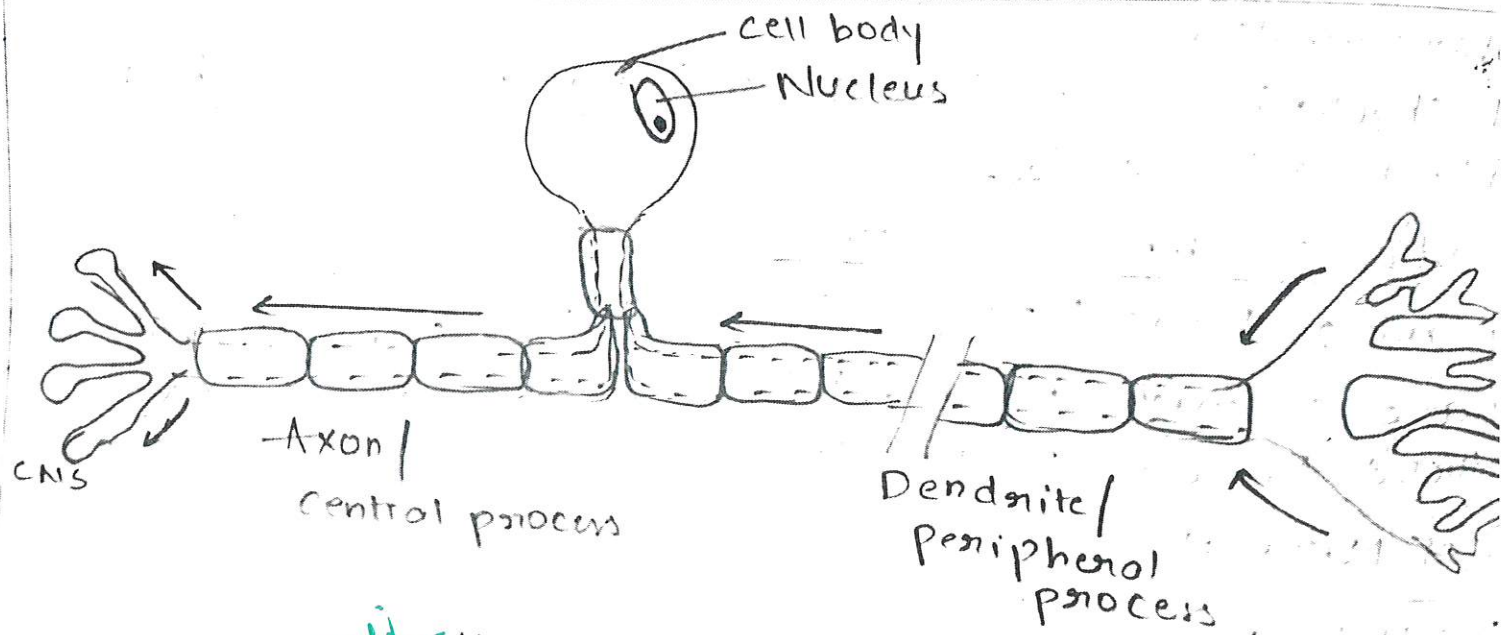
PARTS OF NEURON

1. Cell body
2. Dendrites
3. Axon



- Classification of peripheral nerves according to fiber and physiologic properties:

Fiber class	Sub class	Myelin	Diameter µm	conduction velocity	Location / Function
A	Alpha	+	6-22	30-120	Afferent to efferent from muscles & Joints	Motor, proprio
	Beta	+	6-22	30-120	Afferent to efferent from muscles & joints	Motor, proprio
	Gamma	+	3-6	15-35	Efferent to muscle spindles	Muscle to
	Delta	+	1-4	5-25	Afferent sensory nerves	Pain, temp touch.
B		+	<3	3-15	Preganglionic sympathetic	Various autonom functio
	Sympathetic	-	0.3-1.3	0.7-1.3 µm	Post ganglionic sympathetic	Various autono funct
C	dorsal Root gammac	-	0.4-1.2	0.1-2.0 µm	Afferent sensory nerves	Varie auto functi Pain, tou



UNIPOLAR SENSORY NEURON

Electrophysiology of Nerve Conduction:

A nerve possesses a resting potential. This negative potential of -70 mv that exists across the nerve membrane, produced by differing concentration of ions on either side of membrane. The interior of nerve is negative relative to the exterior.

Step 1:

A stimulus excites the nerve, leading to following sequence of events.

A: An initial phase of slow depolarization. The electrical potential within the nerve becomes slightly less negative

B: When the falling electrical potential reaches a critical level, termed threshold

C: This phase of rapid depolarization results in reversal of electrical potential across nerve membrane interior positive in relation to exterior.

Step 2:

After these steps of depolarization, repolarization occurs, the electrical potential gradually becomes more negative inside the nerve cell relative to outside until the original resting potential of -70 mv is a gain achieved. Entire process require 1 millisecond

Depolarisation: 0.3, Repolarisation takes 0.7 m.sec

Electrochemical of nerve conduction:—

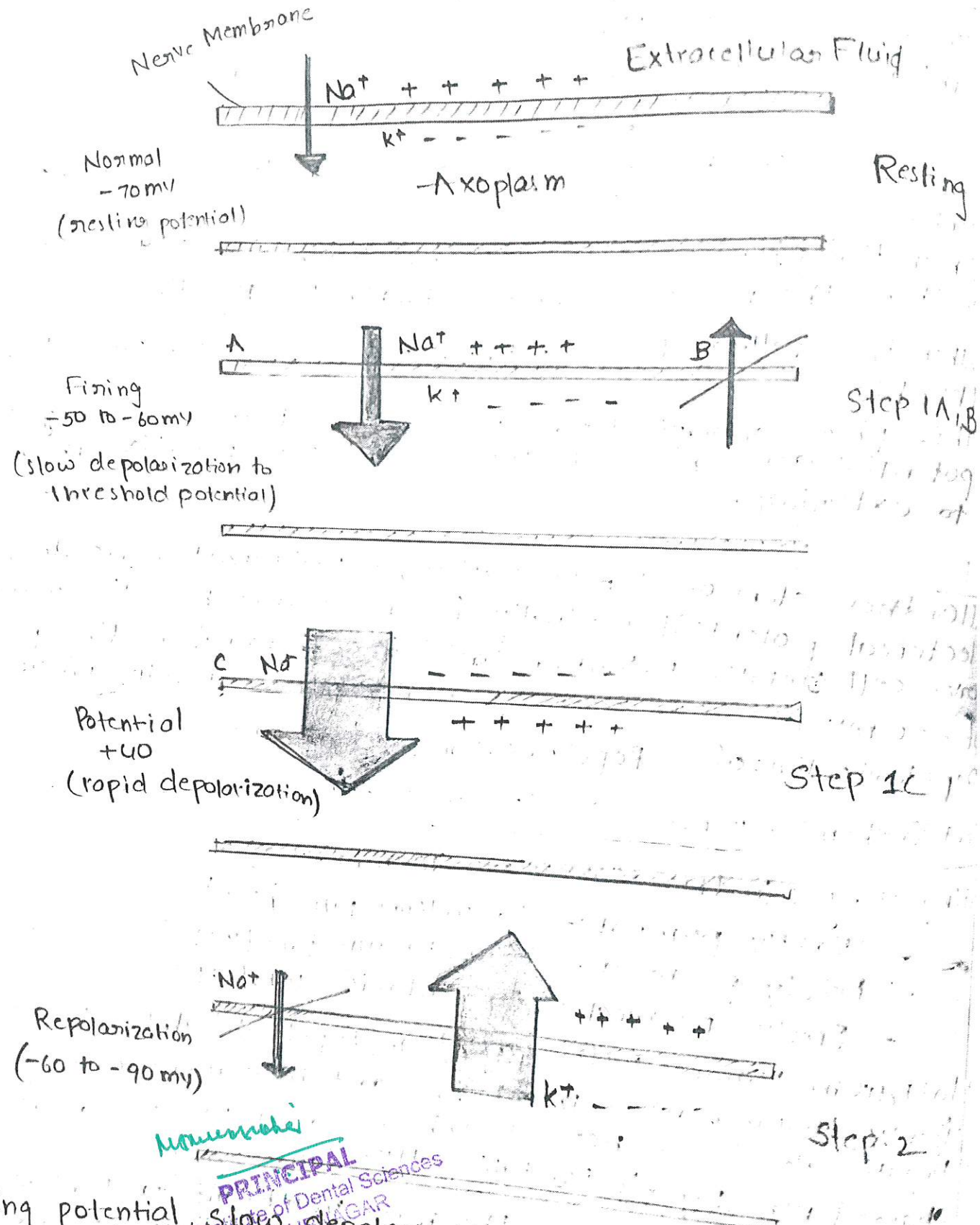
Resting stage: In this state, nerve membrane is

- Slightly permeable to sodium ions (Na^+)
- Freely permeable to potassium ions (K^+)
- Freely permeable to Chloride ions (Cl^-)

→ Potassium remains within axoplasm, despite its ability to diffuse freely through nerve membrane and its concentration gradient negative charge of nerve membrane restrains the positively charged ions by electrostatic attraction.

→ Chloride remains outside the nerve membrane instead of moving along its concentration gradient because the opposing, nearly equal electrostatic influence forces outward migration. The net result is no diffusion of chloride through the membrane.

→ Sodium ions influx occurs because both the concentration gradient and electrostatic gradient favour such migration.



Resting potential, Slow depolarization to threshold (Step 1A, B)
Rapid depolarization (Step 1C), Repolarization (Step 2)

Mechanism of Action of Local Anesthesia:

It is possible for local anesthetics to interfere with excitation process in nerve membrane in the following ways:

1. Altering the basic resting potential of nerve membrane
2. Altering the threshold potential
3. Decrease rate of depolarization
4. Prolong rate of repolarization.

Theories explaining mechanism of Local anesthesia:

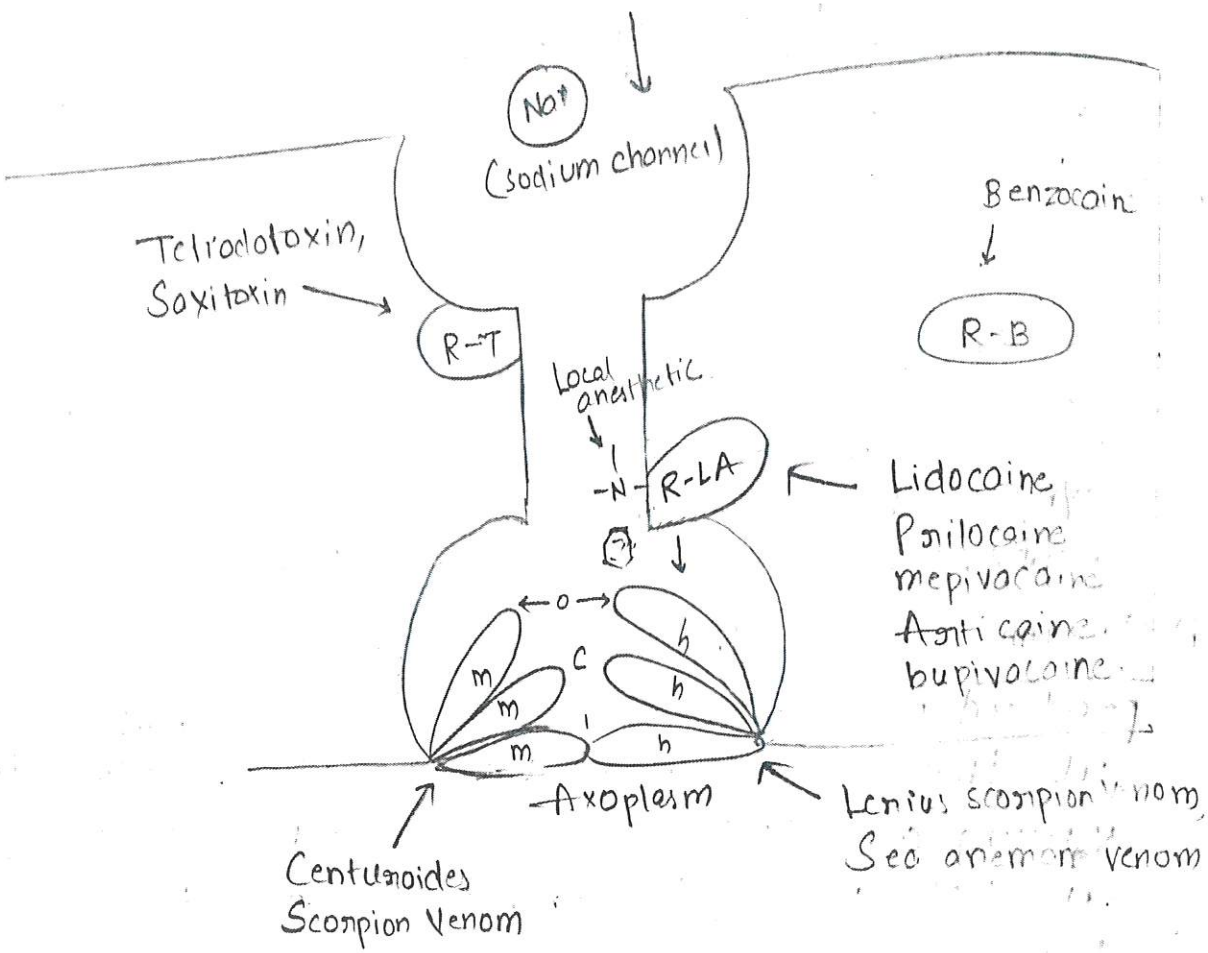
(a) **Acetyl choline theory:** Stated that acetylcholine involved in nerve conduction, in addition to its role as neurotransmitter at nerve synapse. No evidence indicates that acetylcholine is involved in neural transmission along body of the neuron.

(b) **Calcium displacement theory:** Local anesthesia nerve block was produced by displacement of calcium from some membrane site that controlled permeability to sodium. Evidence that varying concentration of calcium ions not affected local anesthetic potency has diminished the credibility of the theory.

(c) **Surface Charge:** Local anesthesia act by binding to the nerve membrane and changing the electrical potential at membrane surface. Evidence indicates that resulting potential of nerve membrane is unaffected by local anesthesia.

(d) **Membrane Expansion theory:**

States that local anesthesia molecules diffuse to hydrophobic regions of excitable membrane, it prevents an increase in permeability to sodium ions. Local anesthetics are highly lipid soluble, it easily penetrates the lipid portion of cell membrane, producing change in configuration. This results in decreased diameter of sodium channels, leads to inhibition of both sodium conductance and neural excitation.



- Tertiary amine local anesthetics inhibits the influx of sodium during nerve conduction by binding to receptor within the sodium channel.

(e) Specific Receptor theory:

Most favoured today, proposes that local anesthesia act by binding to specific receptors on sodium channel.

→ Specific receptor site for local anesthesia exists in the sodium channel either on its external surface or on the internal axoplasmic surface. This causes lied permeability to sodium ions and nerve conduction is interrupted.

The drug alter nerve conduction in atleast 4 sites within sodium Channel

1. Within the sodium channel
2. At the outer surface of sodium channel
3&4. At the activation (or) inactivation gate

⑨ SYSTEMIC COMPLICATIONS OF LOCAL ANAESTHESIA

Local anesthetics are extremely safe drugs when used as recommended ~~toh~~doses, whenever any drug including LA is used, the potential for unwanted and undesirable responses exists. Whenever the drug is administered two types of actions may be observed (a) desirable actions (b) Undesirable actions.

Principle-1 : No drug ever exerts a single action

Principle-2 : No clinically useful drug is entirely devoid of toxicity

Principle-3 : Potential toxicity of drug rests in the hands of the user.

Classification of adverse drug reactions:

- Labeled as side effects, adverse experiences drug induced diseases, secondary effects and intolerance.
- Toxicity caused by direct extension of unusual pharmacologic effect of drug 1. side effects 2. overdose Reactions 3. Local toxic effects.
- Toxicity caused by allergic responses to the drug
- Overdose reactions, allergy and idiosyncrasy are important in relation to local anesthesia and pain control.
- Overdose Reaction – due to over administration of the drug.
- LA overdose, depress excitable membranes [CNS & myocardium & target organs].
- Allergy : hypersensitive state acquired through exposure to particular allergen reexposure brings heightened capacity to react clinical manifestation are. fever, urticaria, dermatitis, bronchospasm, anaphylaxis.

PREDISPOSING FACTORS – FOR LA OVERDOSE:

(a) Patient Factors.

Age
Weight
Other drugs
Sex
Presence of disease
Genetics
Mental attitude & Environ

(b) DRUG FACTORS:

- Vasoactivity
- Concentration
- Dose
- Route of administration
- Route of injection
- Vascularity & injection site
- Presence & vasoconstrictors.

CAUSES :—

↑sed blood levels of local anesthesia results in

- Biotransformation & drug is usually slow
- Slow elimination by the kidneys from the body
- Absorption from injection site is usually rapid
- Intravascular administration.

CLINICAL MANIFESTATIONS :—

Target organs for LA include CNS and myocardium

- CNS is extremely sensitive to the actions of LA as cerebral levels of LA ↑ses, clinical signs & symptoms observed.
- LA cross the BBB, producing CNS depression.
  Non-overdose levels & Lidocaine < 5 µg/ml – has no CNS effects.
- CNS toxicity appear at lidocaine cerebral blood level > 5 µg/ml it shows agitation, talkativeness & irritability.
- Tonic clonic seizures occur > 7.5 µg/ml with further ↑se, seizure activity ceases & CNS depression & apnea are manifested.

Minimal to Moderate Overdose levels :—

SIGNS:	Symptoms
Talkativeness	Light headness & dizziness
Slurred speech	Restlessness
Euphoria	Nervousness
Dysarthria	Numbness
Sweating	Sensation twitching before twitching is observed.
Vomiting	Metallic taste
	Visual disturbance.

Moderate to high Overdose levels:

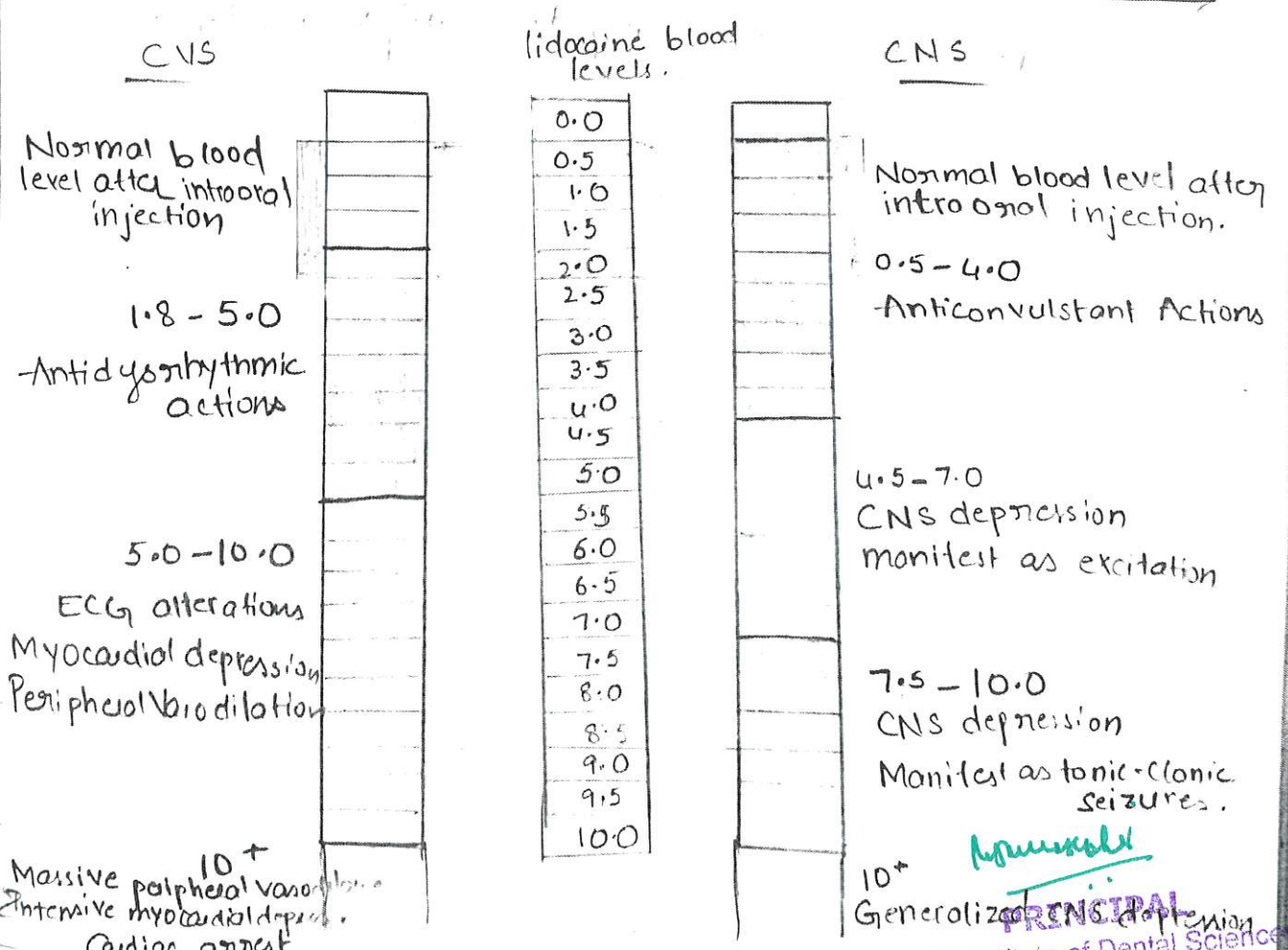
Signs: Tonic clonic seizure activity followed by generalized CNS depression.

Depressed blood pressure, heart rate, Respiratory Rate.

CVS ACTION —

- CVS, specifically the myocardium, less sensitive to actions of LA adverse CNS actions have appeared.
- LA, primarily lidocaine use in management of cardiac dysrhythm premature ventricular concentrations & Ventricular tachycardia.
- Minimum effective level of lidocaine for this action is 1.8 µg/ml and maximum is 5 µg/ml. The level at which undesirable actions become more likely.
- Lidocaine at >10 µg/ml - cause massive peripheral vasodilation reduction in myocardial contrality, severe bradycardia & possible cardiac arrest.

LOCAL ANESTHETIC BLOOD LEVELS & ACTION ON CVS, CNS:



BASIC EMERGENCY MANAGEMENT:

P - Position

Unconscious - supine with feet elevated slightly
Conscious - based on patient comfort

C - Circulation

Unconsious - assess & provide chest compression
If necessary conscious ... assess airway

B - Breathing

Unconscious ... assess and ventilate if necessary
Conscious ... assess breathing

D - Definitive Care

Diagnosis
Management : Emergency drug and/or assistance.

(11) ARMAMENTARIUM FOR LOCAL and EXODONTIA

The essential components of armamentarium for LA are as follows.

1. Syringe
2. ~~Needle~~
3. LA cartilage / Multidose Vials.
4. Additional Armamentarium.

The Syringe:

The syringe is one of three essential components of the LA armamentarium. It is vehicle where by the content of the anesthetic cartilage is delivered through the needle to the patient

Types of syringes:

1. Non disposable Syringe:
   (a) Breech loading, metallic, cartilage type, aspirating
   (b) Breech loading, plastic, cartilage type, aspirating
   (c) Breech loading, metallic, cartilage type, self aspirating
   (d) Pressure syringe for periodontal ligament injection
   (e) Jet injector.
2. Disposable Syringes
3. Safety Syringes
4. Computer Controlled LA delivery systems.

The Needle

- It is vehicle that permits local anesthetic solution to travel from the dental cartridge into the tissues surrounding the needle tip.
- All needle used in dentistry are Stainless steel & disposable.

Components — bevel, shaft, hub & cartilage penetrating end.

Selection of Needle

2 Factors < Gauge / Length.

GAUGE → Diameter of the lumen of the needle

Smaller the number, the greater the ~~number~~ diameter of the lumen.

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GAUGE — Diameter of the lumen of the needle

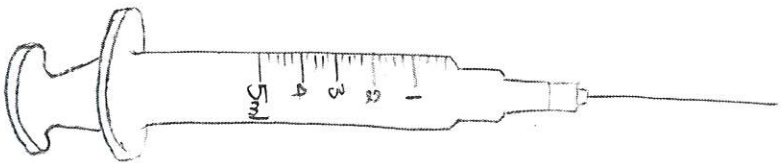
Smaller the number, the greater the ~~number~~ diameter of the lumen.

Advantage of larger guage needle over smaller gauge needles

Less deflection as the needle advances through tissues
Greater accuracy of injection
Less chance of needle breakage
Easier aspiration
No perceptual difference in patient comfort.

LENGTH :—

Dental needles are available in three lengths — long, short & Ultrashort
- Ultrashort needle are available only as 30 guage needles.
- Length : Measured from hub to tip of short needle is b/w 20 & 25 mm, with standard of about 20mm.
- Dental long needle measures b/w 30 & 35, with standard of about 32mm
- A long needle is pretterred for all injection techniques in which penetration of approximately 20mm / more of soft tissues.
- Short needles may be used for any injection in any patient who doesnot require penetration of significant depth of soft tissue.



DISPOSABLE SYRINGE

ARMAMENTARIUM FOR CLOSED EXTRACTION:

1. Equipment for LA
2. Periosteal elevator (or) moon's probes for reflection of soft tissue.
3. Elevator – correct type of elevator should be selected for each other.
4. Forceps – each type of tooth has different type of forceps designed for patient
5. Gauge, saline, suction etc.

Periosteal Elevator

When an incision is made through the periosteum, ideally the periosteum should be reflected from the underlying cortical bone in a single subperiosteal layer with a periosteal elevator.

→ The instrument that is most commonly used in oral surgery is the No.9 Molt periosteal elevator.

- This instrument has sharp, pointed end and broader, rounded end.
- The No.9 Molt periosteal elevator is typically used to tissue by 2 Methods.
- In the first method, pointed end is used in twisting, prying motion to elevate soft tissue, most commonly when elevating dental papilla b/w teeth / attached gingiva around to be extracted.

→ 2nd Method involves push stroke in which the side of pointed end / broad end of instrument is slid underneath the periosteum, separating it from underlying bone.

Dental Elevators

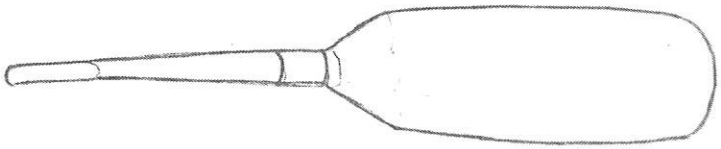
- Used to luxate (loosen) teeth from surrounding bone
- By elevating teeth before the application of forceps, to minimize the incidence of broken crowns, roots & bone
- components of dental elevators → handle, shank and blade.

Types of elevators

1) STRAIGHT TYPE:— It has blade with concave surface on one side that placed towards the tooth to elevator.

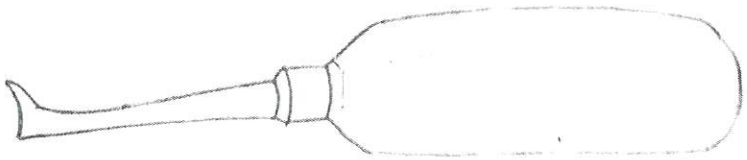
- Used for beginning the luxation of an erupted teeth, before application of forceps.
- Larger Straight ~~forceps~~ elevators used to displace roots from their sockets & to luxate teeth that are more widely spaced.

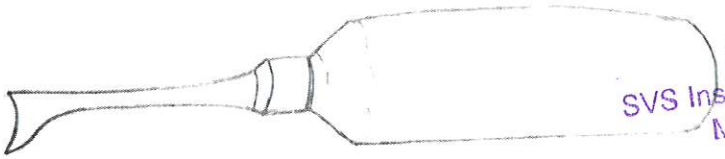
Eg:- Coupland elevator.



2) TRIANGLE | PENNANT SHAPED TYPE:

- It is provided in pairs – left & Right. It is useful when a broke root remains in the tooth socket & the adjacent socket is empty.
- Cryer elevator is the most commonly used type.





PRINCIPAL
SVS Institute of Dental Sciences
MAHABUBNAGAR

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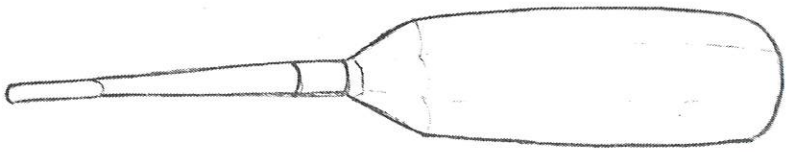

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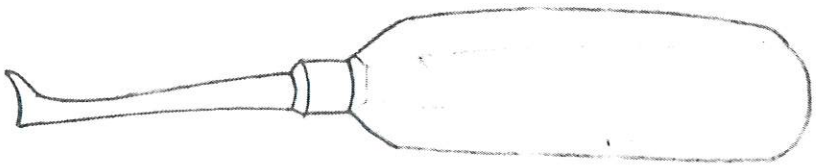
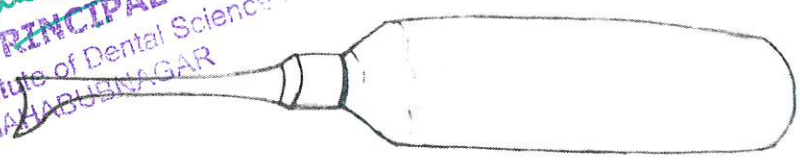
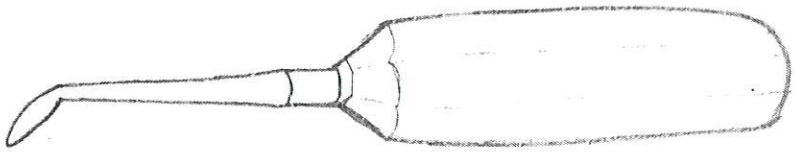




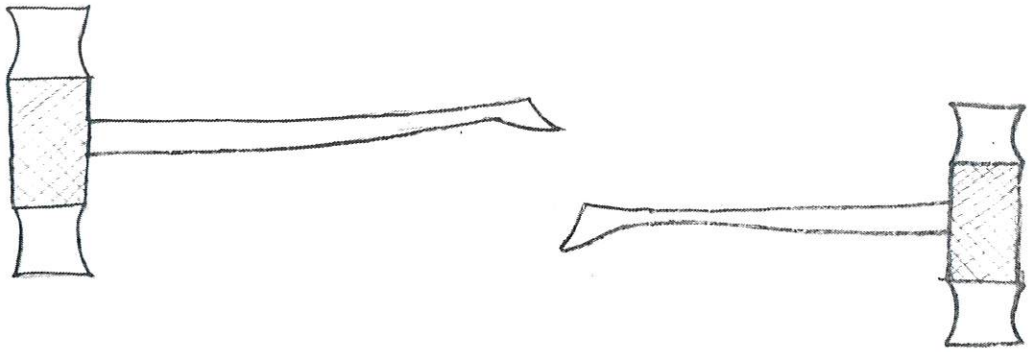
3. PICK TYPE ELEVATOR:

- It is used to remove roots heavy version of craine pick.
- Used to elevate a broken root from tooth socket
- The second type of pick is root tip pick / the apex elevator. It is the delicate instrument that is used to tease small root tips from their socket.



CROSS-BAR ELEVATOR :—

- Blade is at right angle to the shank and handle, blade is curved triangular in shape.
- cross bar handle is used on certain elevators. Type of handle can generate large amounts of force & therefore must be used with greater caution.

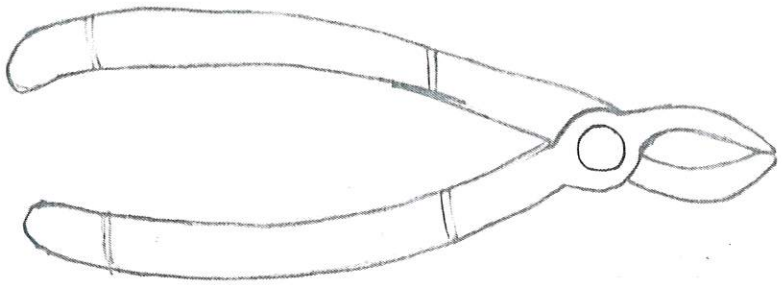


→ DENTAL EXTRACTION FORCEPS :—

Components of dental extraction forceps: Handle, hinge and beak.

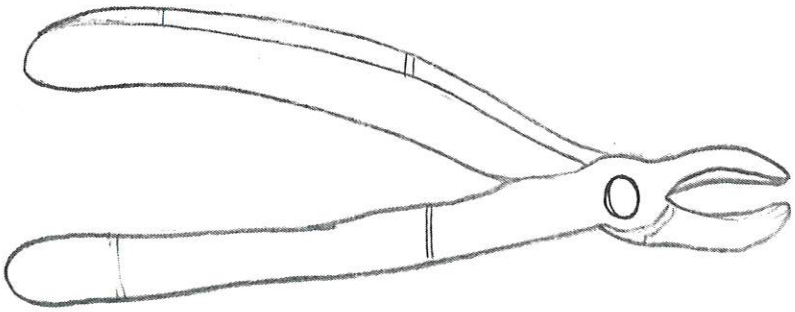
Maxillary Anterior forceps:

- They have identical beaks, that are closely straight, flat & broad.
- Handles are straight.
- Used for the extraction of maxillary incisors & canines.



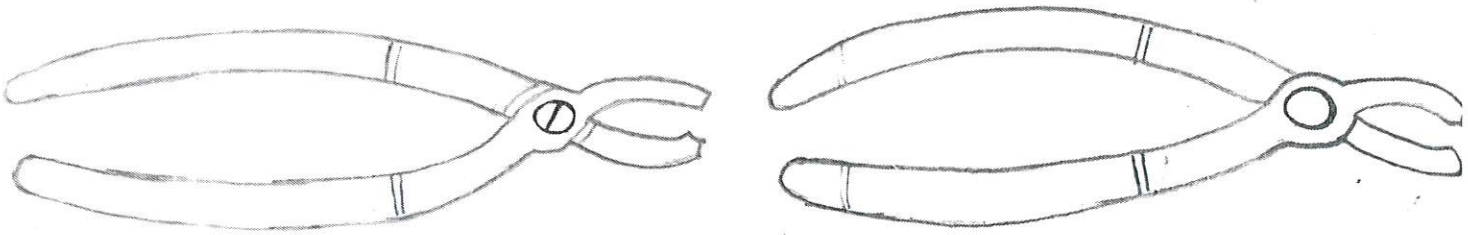
Maxillary Premolar forceps:

- They have identical beaks that concave on side facing the Operator.
- The beaks are broad and open. The curvature of blade is to acesses to premolars placed posteriorly in arch.
- Rotation and buccal movements are given for maxillary 2nd only buccopalatal movements given for 1st PM.



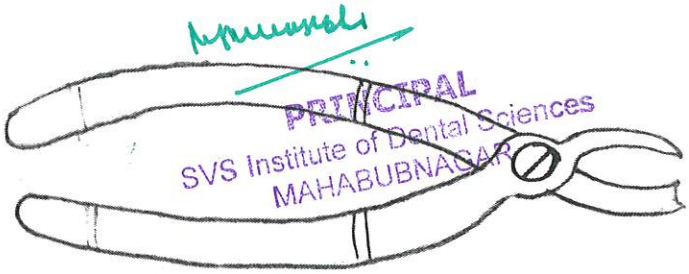
Maxillary Molar forceps

- Maxillary molar teeth are three rooted teeth, with single palatal root and buccal bifurcation.
- Therefore, forceps that are specifically adapted to fit maxillary molars must have a smooth, concave surface for palatal root and a beak with a pointed design that will fit into buccal bifurcation.
- Molar forceps come in pairs: aleft and right.



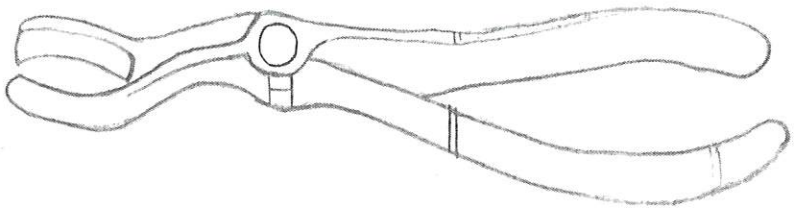
Maxillary Cowhorn forceps : (Right and left)

- The forceps have identical beaks one of which has single point and other bifid pointed tip. The single pointed tip engages furcation b/w two buccal roots and bifid tip engages pala root
- Paired forceps.
- Used for maxillary teeth with excessive destruction of crown, but fucation is intact.



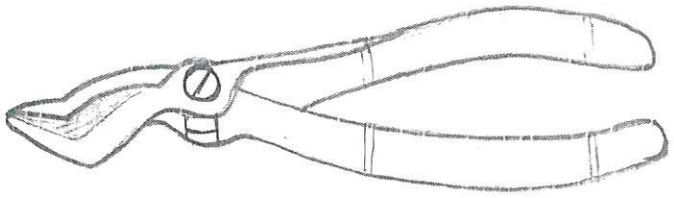
Maxillary third molar forceps :-

The handles are extra long & beak are angulated when viewed from side.



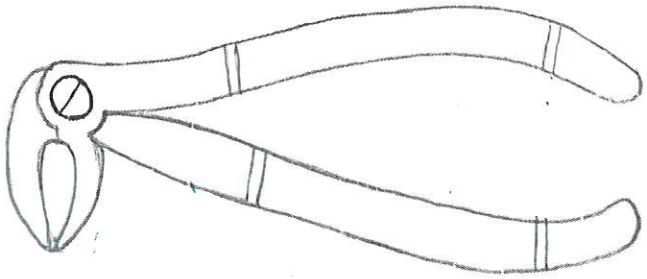
Bayonet Forceps :

They have identical, pointed, angulated & closed narrow beaks - It is used to remove broken maxillary molar roots.



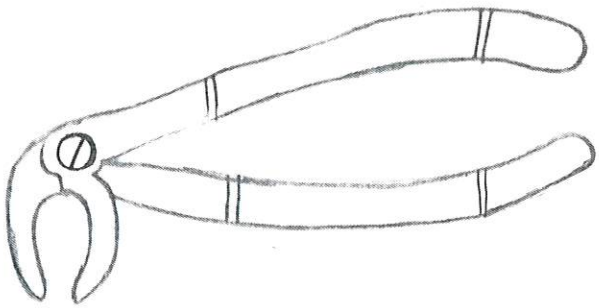
Mandibular anterior forceps :

- They have identical broad, short & closed beaks, they are used for extracting mandibular anterior teeth. The joint is rivet joint unlike most forceps that have box joint. They are used for extraction of mandibular incisors & canines.



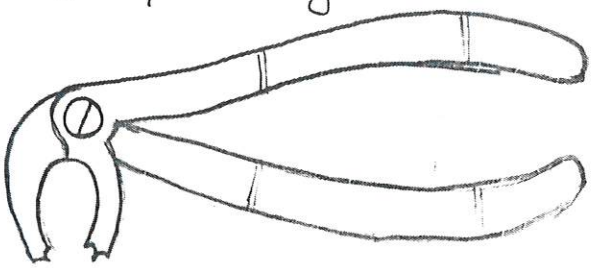
Mandibular Premolar forceps :-

- They have identical broad open beaks that are longer than beaks of anterior forceps.
- They are used to extract mandibular premolar.



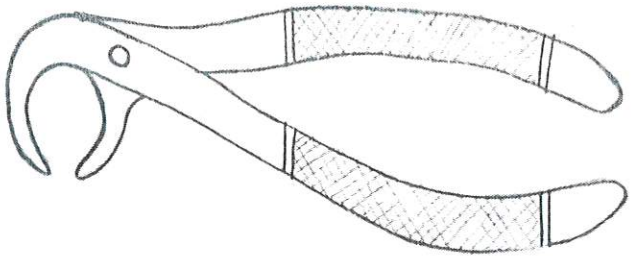
Mandibular Molar Forceps :-

- They are straight handled, beaks are set obviously downward. The beaks have pointed tips in center to be set into the bifurcation at buccal & lingual surfaces.
- They are not paired
- All molar are extracted by buccolingual movements.



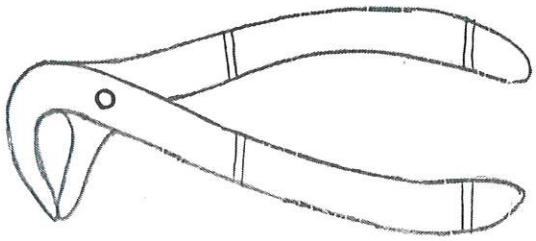
Mandibular Cowhorn Forceps :-

- They have identical open short & pointed beaks that resemble the horns of cow, the beaks are round and tapers to a point
- The forceps grips the tooth at bifurcation between mesial & distal roots.
- Use ⇒ Grossly decayed carious mandibular molar.



Mandibular Root Forceps :—

- They have identical slender beaks that are closed, beaks are longer than that of premolar forceps.
- Use: Removal of root stumps of all mandibular teeth.



Oral Surgery Case History & Treatment
Exodontia

Name of the patient Balaiah

Date: 15/12/22
O.P.No. 2228083

Age 65

Sex: M

Occupation Farmer

Address Mahabubnagar

Chief Complaint Patient complain pain and loosening of tooth in Upper right posterior region for the past two years.

History of Present illness Patient was apparently assymptomatic 2 years back, later he noticed loosening of teeth and pain in Upper right posterior region. Pain is gradual in onset, continuous throbbing type of pain which aggevates on eating and releaves after some time.

Medical Histrory
Known hypertensive patient, Undermedication since two years.

Dental History 1st Visit

Personal & Family History
Diet: Mixed
Appetite: Normal
Sleep: Adequate
Bowel & Bladder movt: Normal
Habits: No adverse habit

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General Physical Examination

Built - Moderate

Gait - Normal

Cyanosis - No abnormality detected

Icterus - No abnormality detected

Skin Eruptions - No abnormality detected

Lymph Nodes — On palpation, no abnormality detected

Vital Signs

Blood Pressure 120/90 mmHg

Heart Rate 85 bpm

Respiratory Rate 18 cycles/min

Temperature Afebrile

ASA Classification

Tick the appropriate

Class I	Class II	Class III	Class IV	Class V
	✓			

Extra oral examination :

Symmetry: No gross facial asymmetry

Mouth opening Adequate

T.M.J.: Bilateral synchronous movement with no clicking & popping sounds.

Local Examination

Soft Tissue Examination :

Lips Incompetent

Buccal Mucosa Normal

Tongue Normal

Floor of the month Normal

Hard palate Normal

Soft Palate Normal

Gingiva coral pink, Generalized Recession

Hard Tissue Examination

No. of teeth present 28

No. of missing teeth $\frac{-|7}{87|7}$

Decayed Teeth $\frac{}{|6}$

Root Stumps

Mobility Gr I: $\frac{5|}{1|1}$ Grade II: $\frac{8|68}{}$ Grade III: $\frac{76|}{}$

PROVISIONAL DIAGNOSIS Chronic generalized Periodontitis i.r.t ~~87~~ 876

INVESTIGATIONS Intraoral periapical radiograph i.r.t ~~87~~ 876

FINAL DIAGNOSIS Chronic generalized periodontitis 876

TREATMENT Extraction i.r.t 876

POSTOP MEMO :

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Nerve Supply

16: Buccal: Posterion Superion Alveolar Nerve
Pulp: Posterion Superion Alveolar Nerve, Middle Su
Palatal: Greater Palatine Nerve

17: Buccal: Posterion Superion Alveolar Nerve
Pulp: Posterion Superion Alveolar Nerve
Palatal: Greater Palatine Nerve

18: Buccal: Posterion Superion Alveolar Nerve
pulp: Posterion Superion Alveolar Nerve
Palatal: Greater Palatine Nerve

Nerve Blocks:

Buccal infiltration i.r.t 17 & 18
Greater Palatine Nerve block

Treatment Done:

Extraction done ↓ LA (2% Lignocaine) i.r.t 17 & 18

Post Extraction instructions given & medications prescribed.

TAB. COMBIFLAM ——— ⑥
[Ibuprofen (400mg) + Paracetamol (325mg)]
P.O | BID | 3 days | after meals.

Oral Surgery Case History & Treatment
Exodontia

Name of the patient KONDANA

Date: 2/2/23
O.P.No. 2228702

Age 60

Sex: M

Occupation Farmer

Address Kurumurthy Nagar

Chief Complaint : Patient complains of lossening of teeth in upper right and left tooth region since 1year.

History of Present illness Patient was apparently assymptomatic one year back, later he noticed that loosening of teeth in upper right & left back teeth region and not assosiated with pain and swelling. No aggrevating and releaving factors.

Medical Histrory No known medical history

Dental History 1st Visit : Extraction
2nd Visit : Extraction
3rd Visit :

Personal & Family History

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General Physical Examination

Built – Moderate

Gait – Normal

Cyanosis - No abnormality detected

Icterus – NO abnormality detected

Skin Eruptions – No abnormality detected

Lymph Nodes - On palpation, no palpable lymph nodes found.

Vital Signs

Blood Pressure - 120/80 mm Hg

Heart Rate 68 bpm

Respiratory Rate 13 cycles/min

Temperature Afebrile

ASA Classification

Tick the oppropriate

Class I	Class II	Class III	Class IV	Class V
✓				

Extra oral examination :

Symmetry: No gross facial asymmetry

Month opening Adequate

T.M.J.: Bilateral synchronous movement with no clicking & popping sounds.

Local Examination

Soft Tissue Examination :

Lips – competent

Buccal Mucosa - Normal

Tongue – Normal

Floor of the month - Normal

Hard palate – Normal

Soft Palate – Normal

Gingiva — coronal pink, Generalized recession.

Hard Tissue Examination

No. of teeth present - 3

No. of missing teeth $\frac{1\,6\,5\,4\,3\,2\,1 \mid 1\,2\,3\,4\,5\,6\,7\,8}{7\,6\,5\,4\,3\,2\,1 \mid 1\,2\,3\,4\,5\,6\,7\,8}$

Decayed Teeth -

Root Stumps -

Mobility Grade I : $\frac{8\,5}{8}$

PROVISIONAL DIAGNOSIS Chronic generalized periodontitis ~~i.g.t~~ $\frac{8\,5}{8}$

INVESTIGATIONS OPG

FINAL DIAGNOSIS chronic generalized periodontitis ~~i.g.t~~ $\frac{8\,5}{8}$

TREATMENT Extraction of $\frac{8\,5}{8}$

POSTOP MEMO :

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Nerve supply :

8 | Pulpal innervation : Interior alveolar nerve
Buccal : Long buccal nerve
Lingual : Lingual Nerve.

Nerve blocks Given :

Interior alveolar nerve block
Long Buccal nerve block
Lingual Nerve block.

Treat done

Extraction done ↓ LA (2% Lignocaine) i.o.r.t 8 |

Post extraction instructions given & medication prescribe

Rx

TAB. COMBIFLAM ——— (6)

Ibuprofen (400mg) + Paracetamol (325 mg)

PO | BID | 3 days | after meals.

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SVS INSTITUTE OF DENTAL SCIENCES

APPANPALLY, MAHABOOBNAGAR.

DEPARTMENT OF ORAL & MAXILLOFACIAL PATHOLOGY

Certificate

This is to certify that Hasini Bodapatla has satisfactorily completed the record work that has been prescribed by

NTR UNIVERSITY OF HEALTH SCIENCES in

DEPARTMENT OF ORAL & MAXILLOFACIAL PATHOLOGY,

for III rd year BDS During the year 20 23 to 20 24.

Date: 9/12/23

Reg No: 200210601 0

Staff Incharge
Dept of Oral & Maxillofacial Pathology

Prof & HOD
Dept of Oral & Maxillofacial Pathology

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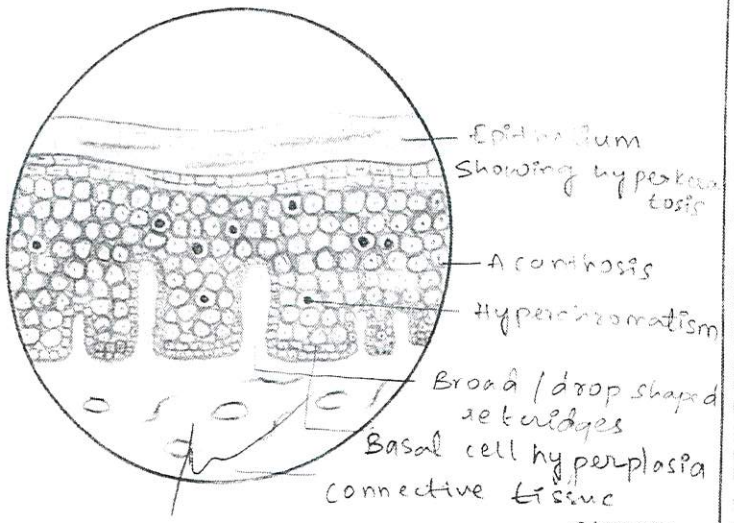
Leukoplakia 1



LEUKOPLAKIA

→ It is a whitish patch or plaque that cannot be characterized clinically or pathologically as any other disease and is not associated with any physical or chemical causative agent except use of tobacco.

→ hyperkeratosis is seen on the surface

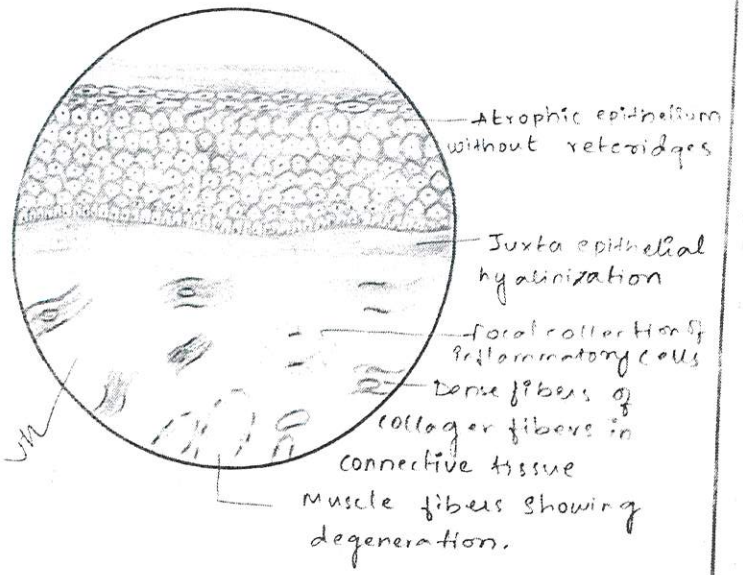
→ Epithelial changes — 1. Acenthosis
2. Basal cell hyperplasia
3. Vacuolar degeneration

→ Bulbous drop shaped rete ridges

→ connective tissue changes

→ Dysplastic changes - disordered growth of epithelial cells.

Oral Submucous fibrosis 2



ORAL SUBMUCOUS FIBROSIS

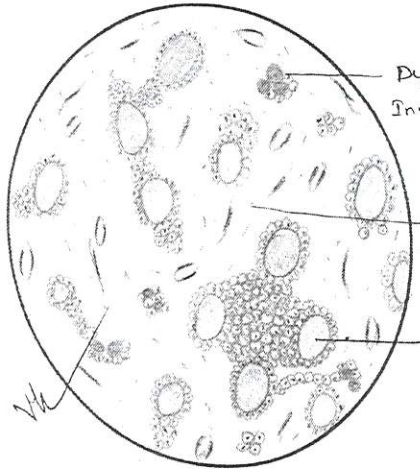
- It is a chronic insidious disease affecting any part of oral cavity + sometimes pharynx. Although occasionly preceeded by vesicle formation as it is always associated with juxta epithelial inflamatory reaction followed by fibroblastic changes in lamina propria with epithelial atrophy leads to stiffness of oral mucosa causing trismus and difficulty in eating.
- oral epithelium is atrophic with loss of rete ridges
- epithelial dysplasia
- Early stages – connective tissue exhibit finely fibrillar collagen intercellular edema and increase fibroblastic activity.
- Advanced stages - homogenization and hyalinization of collagen fibers
- Degeneration of muscle fibers.

Squamous Papilloma 1

SQUAMOUS PAPILLOMA.

- The microscopic appearance of the papilloma is characteristic and consists of many long, thin, finger like projections extending above the surface of the mucosa, each made up of a continous layer of stratified squamous epithelium and containing a thin, central connective tissue core that supports the nutrient blood vessels.
- → Koilocytes (HPV altered epithelial cells with perinuclear clear spaces and nuclear pyknosis) may or may not be found in the superficial layers of epithelium.
- The presence of chronic inflammatory cells may be variably noted in the connective tissue.
- The connective tissue present is only a supportive stroma and is not considered a part of the neoplastic element.

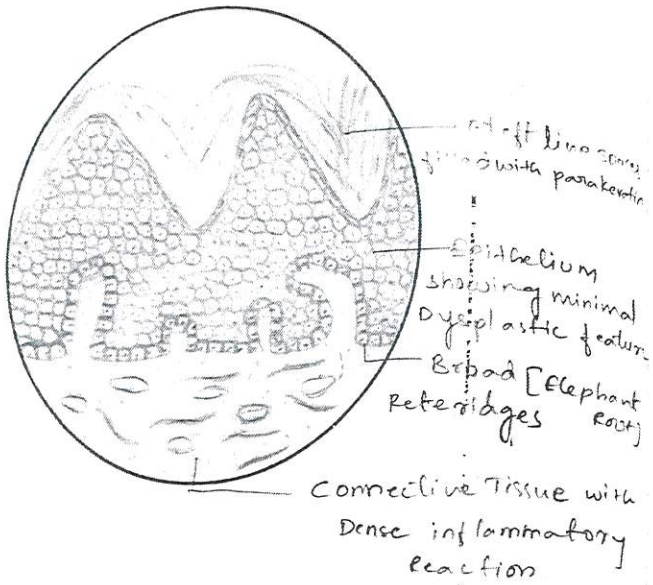
Well Differentiated Squamous cell carcinoma 2



WELL DIFFERENTIATED SQUAMOUS CELL CARCINOMA.

* It Consists of sheet and nests of cells with obvious origin from squamous epithelium
* Cells are large and shows a distinctive cell membrane although intracellular bridges or tonofibrils are demonstrated
* characteristic feature is presence of individual cell Keratinization or keratin pearls of varying sizes
* Cellular to nuclear pleomorphism is high
* Mitotic activity may or may not be seen
* Malignant cells can be found actively invading a connective tissue.

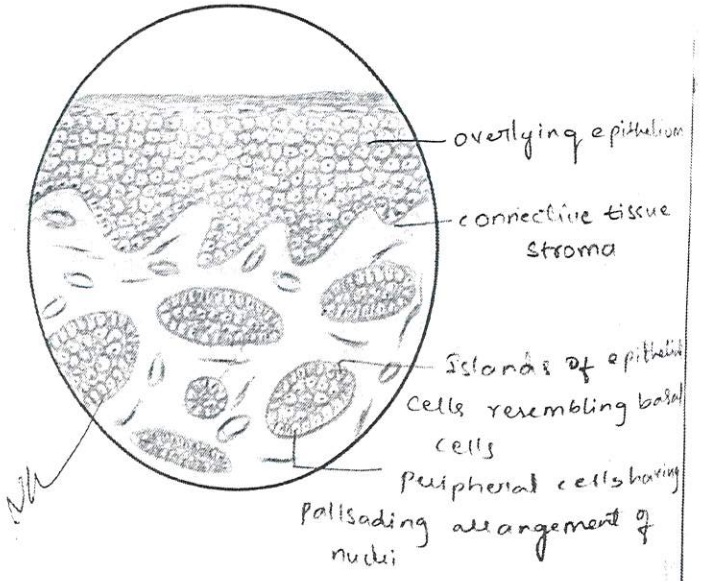
Verrucous Carcinoma 3



VERRUCOUS CARCINOMA

* It is also known as Ackermann's tumors
* Characterized by exophytic overgrowth of well differentiated keratinizing epithelium having minimal atypia and with locally destructive Pushing margins at its interface with underlying connective tissue
* Epithelial proliferation with down growth of epithelium into the connective tissue but usually without a pattern of true invasion.
* cleft like spaces lined by a thick layer of parakeratin extend from surface deep into the epithelium
* Basement is still intact eventhough the lesion is extensive
* When lesions become infected focal intraepithelial abscesses are often seen.
* Chronic inflammatory cell infiltrate in underlying connective tissue is present.

Basal cell carcinoma 4

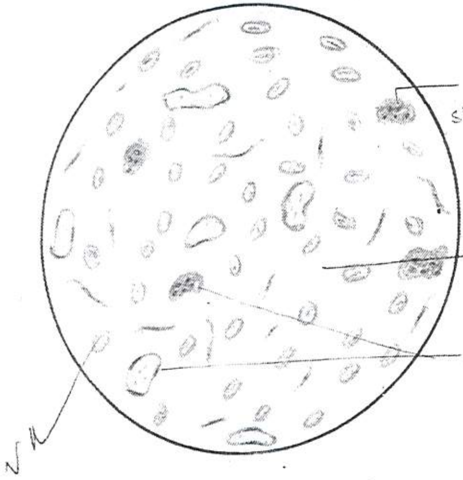


BASAL CELL CARCINOMA

* Most common malignant tumors in humans
* Basal cells typically have large hyperchromatic ovoid nuclei with little cytoplasm and arranged in nests of varying sizes
* Mitotic figures are few in number
* Cells at the periphery of these nests shows palisading pattern
* Early lesions exhibit some connection to the overlying epidermis
* Increased mucin is often present in the surrounding dermal stroma.

Acquired melanocytic nevus · ...curs in parts of Bony Skeleton

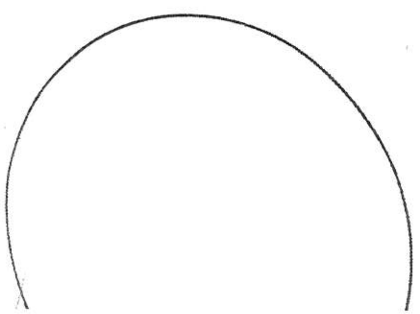
Central giant cell granuloma 5



CENTRAL GIANT CELL GRANULOMA

* It is a unkown benign and proliferative lesion
* Intrasseous lesion, consisting of fibrous tissue containing multiple foci of haemorrhage, aggregations of multinucleated giant cell.
* Made up of a loose fibrillar connective tissue stroma with many interspersed proliferating fibroblasts & small capillaries
* Group of fibres will often present as whorled appearance
* multinucleated giant cells are prominent through the connective tissue.
* foci of new trabeculae of osteoid or bone often seen

Peripheral giant cell granuloma 6

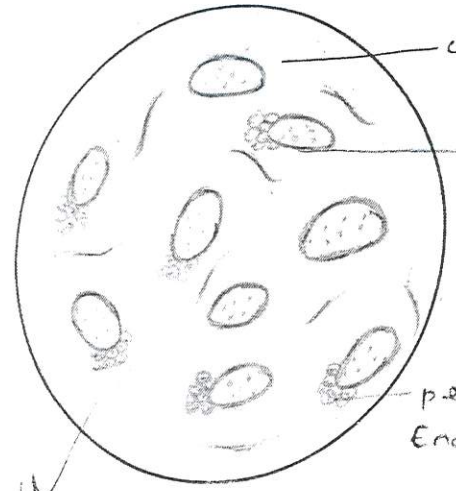


PERIPHERAL GIANT CELL GRANULOMA

Acquired ...

...ss in parts of Bony Skeleton

Capillary Hemangioma



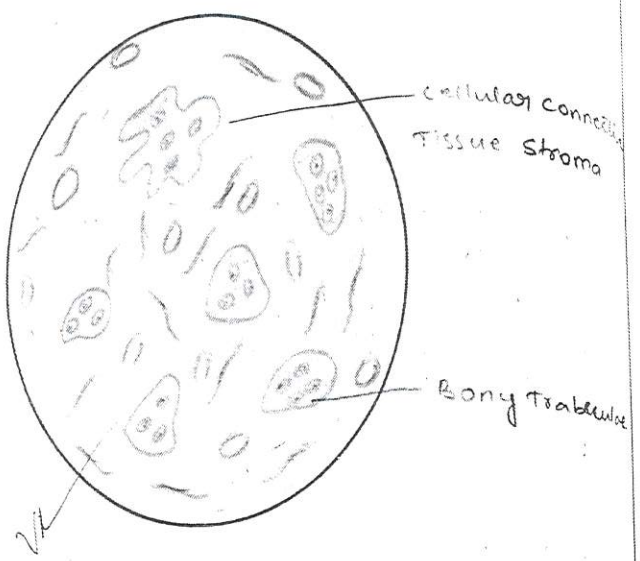
VN

CAPILLARY HEMAMGIONA

* It is characterized by numerous small endothelial lined capillaries which are densely packed with erythrocytes.
* Endothelial linning cells are single layered and are supported by connective tissue stroma
* These cells are well formed, spindle shaped or slightly elongated and plump.
* Intercellular edema and chronic inflammatory cell infilbration are rare.
* foci of proliferating endothelial cells forming small aggregates which lack in their attempt at lumen formation.

LYMPHAGIOMA

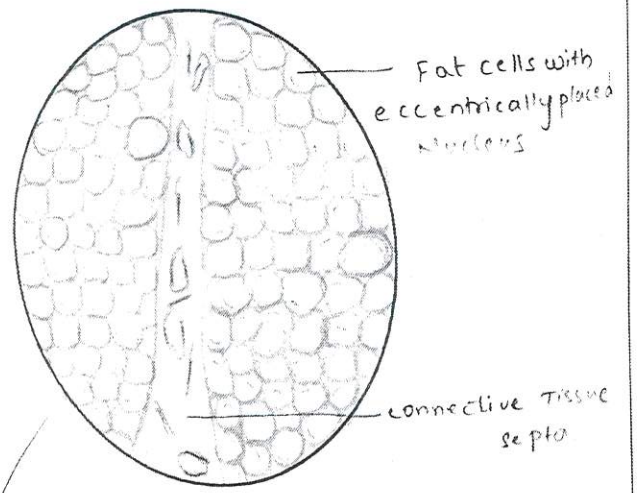
ossifying fibroma



OSSIFYING FIBROMA

* It is a central neoplasm of bone
* Delicate interlacing collagen fibrils arranged in discrete bundles interspersed by large number of active proliferating fibroblasts
* Mitotic figures are present in small numbers
* cellular pleomorphism is present
* Connective tissue present many small foci of irregular bony trabeculae.
* chinese - character shaped bony trabeculae
* Islands of ossifications are present.

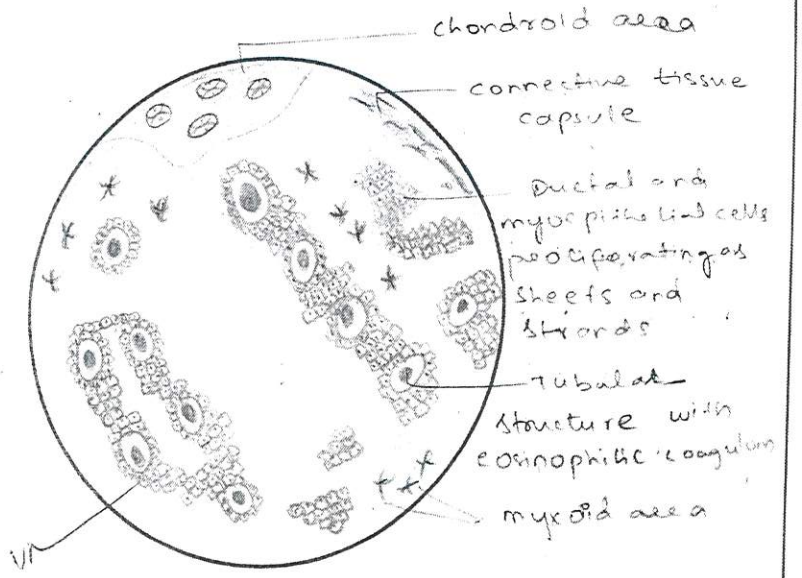
Lipoma



LIPOMA

* Benign, slow growing neoplasm composed of mature fat cells or adipocytes
* composed of predominantly mature adipocytes admixed with collagenic streaks is often well demarcated from surrounding connective tissue.
* Thin fibrous capsule may be seen.
* Lesional fat cells seen to infiltrate into surrounding tissue perhaps producing along thin extensions of fatty tissue radiating from central tumor mass.

Pleomorphic Adenoma

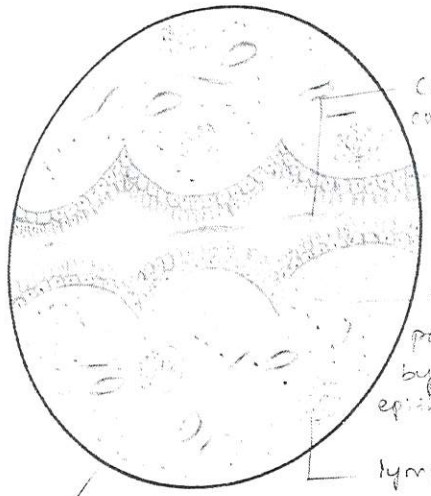


PLEOMORHIC ADENOMA.

- well - circumscribed & encapsulated mass.
- shows glandular epithelial and mesenchymal like tissue.
- shows 3 main components
  - epithelial component
  - myoepithelial component
  - connective tissue stroma.
- Epithelial component
  - forms duct or small cystic space that may contain as eosinophilic coagulum.
- myoepithelial cells
  - some are round with eccentric nuclei and hyalinized cytoplasm resembling plasma cells - plasmacytoid.

Warthins

2

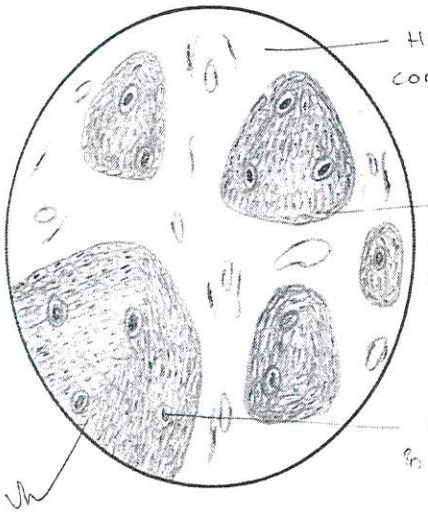


WARTHIN'S TUMOR.

- Exhibit cyst formation, with ductal epithelium projection into cystic space and lymphoid stroma showing germinal centres.
- Inner layers of cells - tall columnar, eosinophilic, finely granular cytoplasm, due to presence of mitochondria and slightly hyperchromatic nuclei.
- outer - layer cells are cuboidal to polygonal, with unicellular nucleus.
- Eosinophilic, coagulum present within cystic spaces
- lymphoid stroma - germinal center formation.

Adenoid Cystic Carcinoma.

3

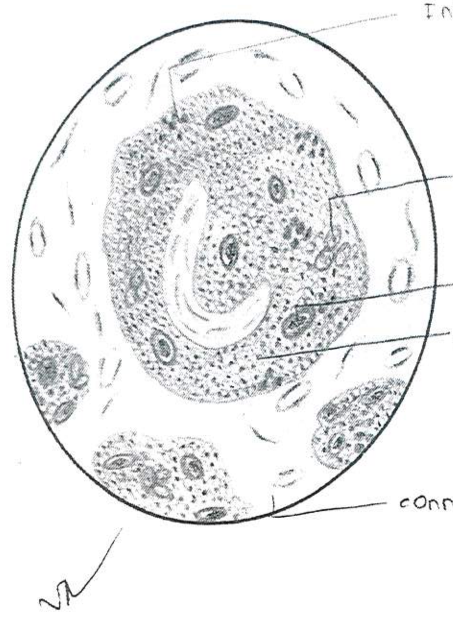


ADENOID CYSTIC CARCINOMA

- myoepithelial cells, Ductal cells in varied arrangement
- 3 forms : cribiform, tubular, solid (basaloid)
- cribiform pattern : [classic type, most common]
- Basaloid cells in nuts form multiple cylindrical cysts like + space remembering swiss - cheese (or) honey comb pattern
- cystic spaces contains PAS due mucopolysaccharide
- Tubular pattern : lined by stratified cuboidal Epithelium
- Solid group of cuboidal cells with little tendency towards cyst (or) duct formation.

Mucoepidermoid carcinoma

4

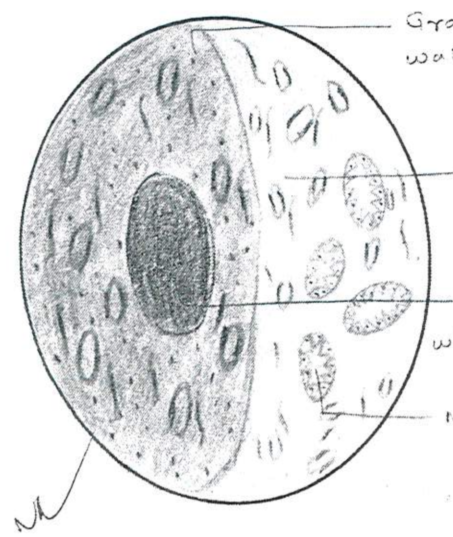


MUCOEPIDERMOID CARCINOMA

- componed of mucous cells, Epidermoid cells, and Intermediate cells and clear cells.
- Epidermoid cells- squamous cells- polygonal shaped cells show occasional keratinization.
- Intermediate cells- basaloid cells → progenitor cells for mucous & squamous cells
- Clear cells- large - polygonal cells with sharply defined cytoplasmic borders and clear cytoplasm
- grading according - amount of cyst formation
  Degree of cellular atypia
  predominance of cell type

Mucocele

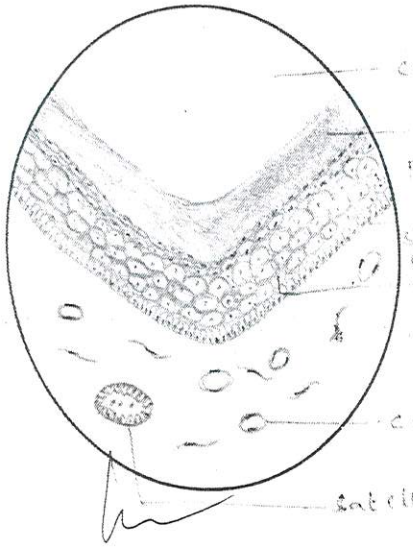
5



MUCOCELE

- Shown an area of spilled mucin surrounded by a granulation tissue response
- central cavity shows mucin + inflammation with numerous foamy histocytes [macrophages]

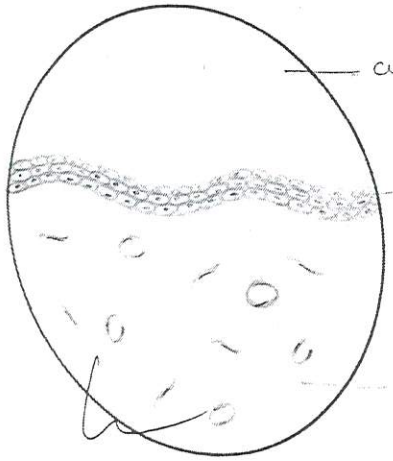
odontogenic keratocyst



ODONTOGENIC KERATOCYST.

- It is a rare and benign but locally aggressive developmental cyst. It is most often affects posterior mandible.
- presence of parakeratin layer is unique
- cystic lining is present which is composed by uniform 6-10 layers of epithelium.
- A well defining palisading columnar basal cell layer with a corrugated parakeratinizing luminal surface in cystic lumen is evident.
- Basal cells showing tombstone appearance
- few areas shows epithelial hyperplasia.

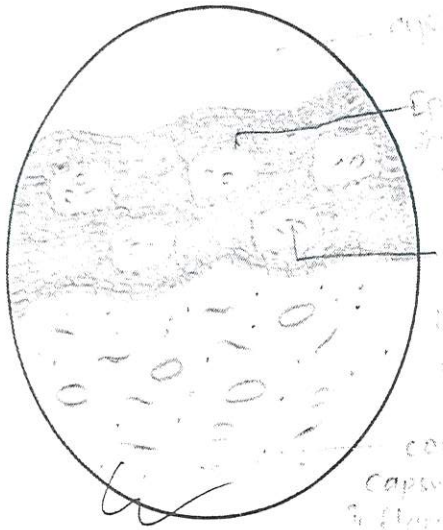
Dentigerous cyst



DENTIGEROUS CYST

- It is also known as follicular cyst.
- odontogenic cyst that surrounds the crown of an impacted tooth is caused by fluid accumulation between the reduced enamel epithelium and enamel surface resulting in a cyst which the crown is located within the lumen.
- It is composed of thin layer of non keratinized stratified squamous epithelium of 2-4 cell layer thickness
- Rete pegs formation is absent.
- ciliated cells may be found in epithelial lining.
- lumen in thin watery yellow fluid.
- connection tissue is thin and loose fibrous connective tissue.

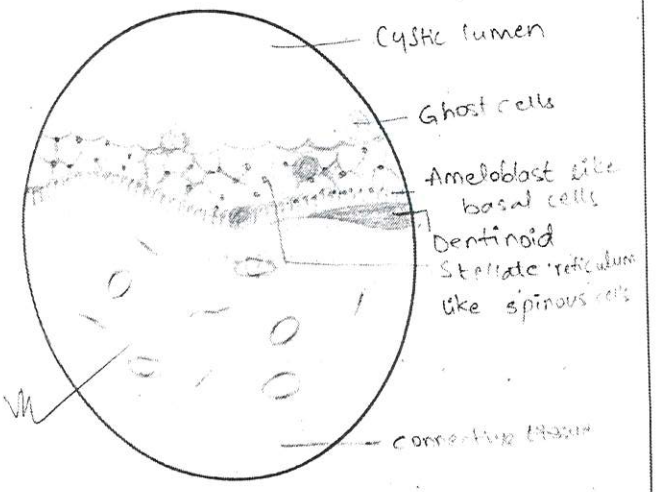
Radicular cyst



RADICULAR CYST

- It is lined by non-keratinized stratified squamous epithelium
- cyst wall is composed of dense fibrous connective tissue with an infiltrate.
- Radicular or apical periodontal cyst is an inflamatory odontogenic cyst that develops in the periapical region of a non-vital tooth and hence is called root end cyst..
- Epithelium shows inflammatory cells infiltration
- cystic lumen is filled with fluid containing cholesterol or crystals
- Epithelium showing arcading epithelium.

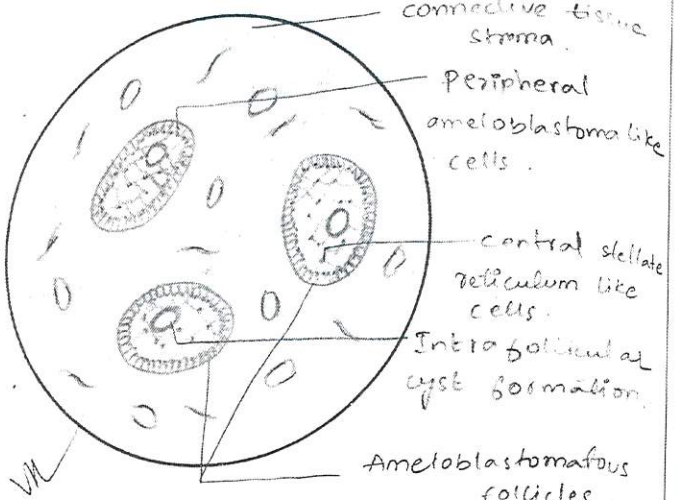
Calcifying Epithelial odontogenic cyst



CALCIFYING EPITHELIAL ODONTOGENIC CYST

- It is also known as Gorlin-gold cyst
- It consists of basal tall columnar cells
- It consists of multiple layer of Stellate cells
- Large vacuoleted eosinophilic areas where cell remnents are seen and cellular outline is seen known as Ghost cells.
- Dentinoid is present.
- It is radiolucent & radiopaque.

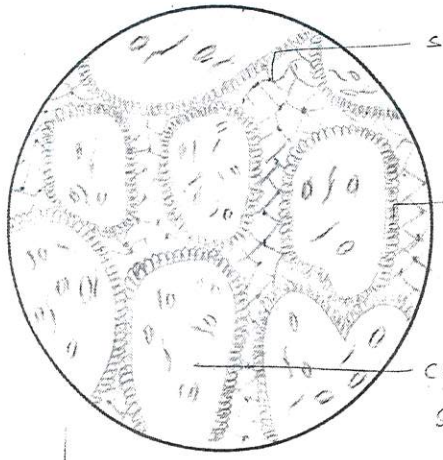
Follicular Ameloblastoma



FOLLICULAR AMELOBLASTOMA.

- It contains of many small discrete islands of tumour composed of a peripheral layer of cuboidal or columnar cells whose nuclei are well polarized.
- cells strongly resemble ameloblast-like cells enclosed in a central mass of polyhedral loosely arranged cells resembling stellate reticulum.
- clinically some cases exhibit tiny cysts that are grossly evident when the lesion is excised and examined carefully.
- In such cases stellate reticulum like tissue has undergone complete breakdown cystic degeneration.

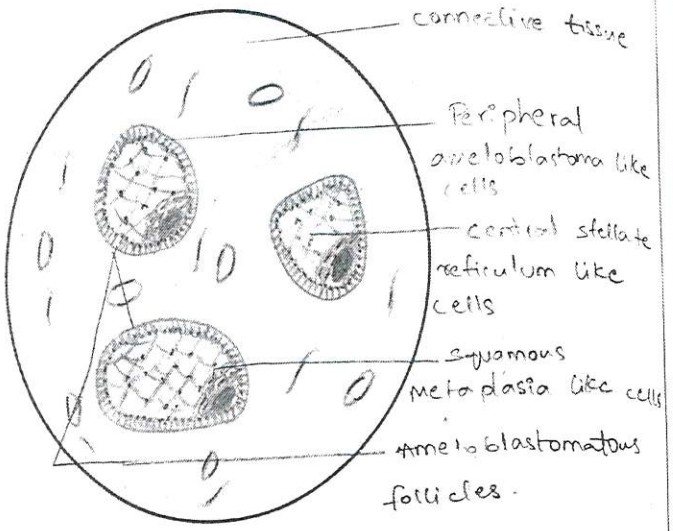
Plexiform Ameloblast



PLEXIFORM AMELOBLAST

- In plexiform ameloblastoma the ameloblast like tumor cells are arranged in irregular masses or more frequently as a network of intee connecting strands of cells.
- Each of these masses or strands is bound by a layer of columnar cells between these layers many be found stellate reticulum like cells.
- stellate reticulum like tissue is much less prominent in plexiform type than in follicular ameloblastoma.
- Areas of cystic degeneration of stroma are also common.

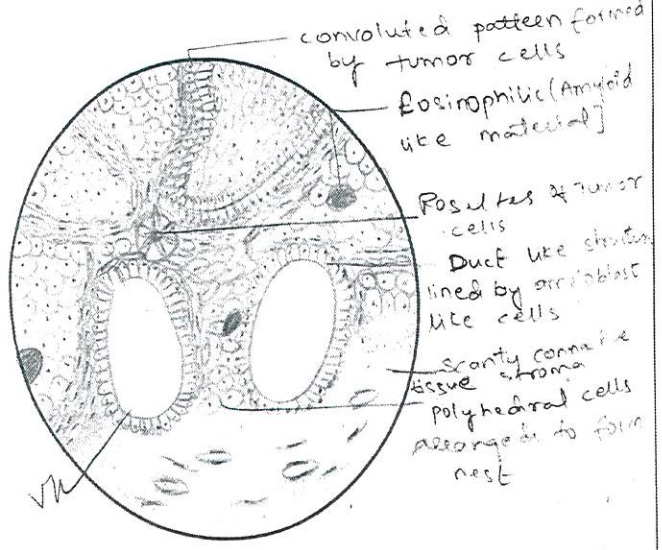
Acanthomatous Ameloblastoma 3



ACANTHOMATOUS AMELOBLASTOMA

- cells occupying the position of stellate reticulum undergo squamous metaplasia, sometimes with keratin formation in central position
- occasionally epithelial or keratin pearls may even be observed.
- sometimes acanthomatous ameloblastoma can mesquerade a squamous cell carcinoma and also appear as a hybrid ameloblastoma admixed with a pronounced desmoplastic pattern.

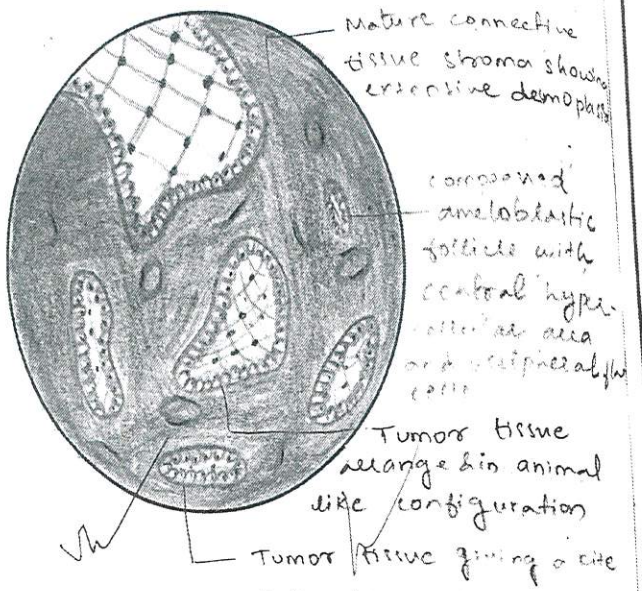
Adenomatoid odontogenic tumor (AOT) 4



ADENOMATOID ODONTOGENIC TUMOR [AOT]:

- The lesion is usually surrounded by a thick, fibrous capsule.
- The tumor is composed of spindle shaped epithelial cells that form sheets, strands or whorled masses with little connective tissue.
- The epithelium cells may form rosette like structure tubular or duct like structures may be prominent or absent.
- calcification may be observed in tumor mass.

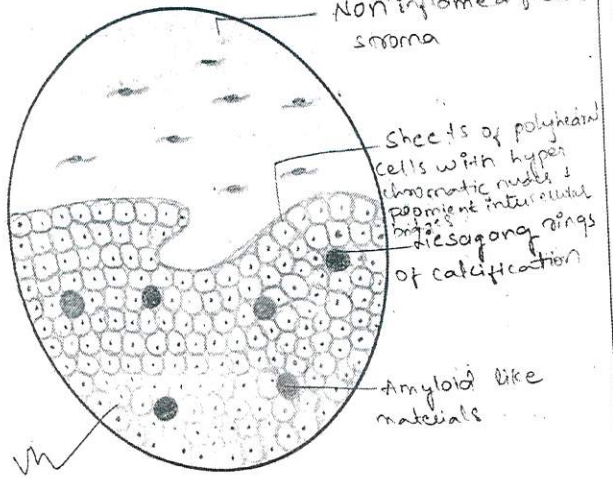
Desmoplastic Ameloblastoma



DESMOPLASTIC AMELOBLASTOMA.

- It is newly recognised rare odontogenic neoplasm that is histological variant of ameloblastoma
- Develops from the periodontal membrane of the related tooth.
- Anterior region of jaws are common site
- Islands of ameloblastoma are surrounded and often compressed by a dense and hyalinized fibrous connective tissue.

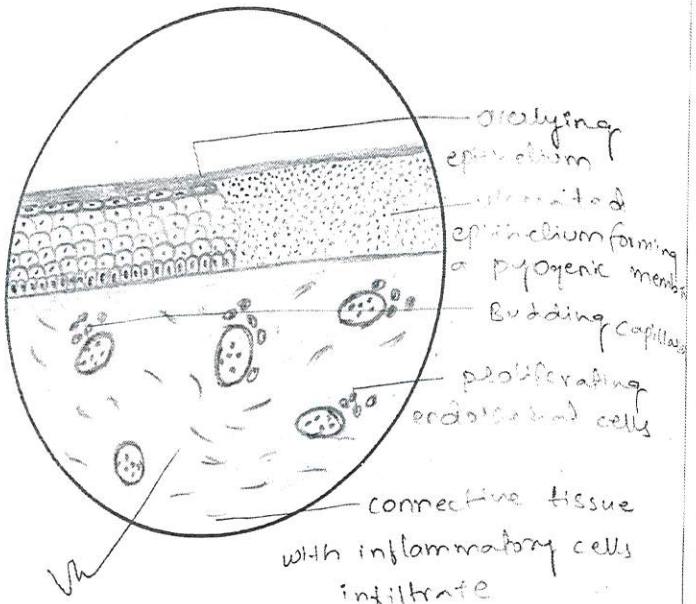
Calcifying Epithelial Odontogenic Tumor



CALCIFYING EPITHELIAL ODONTOGENIC TUMOR [CEOT]

- This lesion is typically composed of islands, sheets or strands of polyhedral epithelial cells in a fibrous stroma
- Areas of ammorphos, eosinophilic, hyalinized extracellular material may be scattered throughout
- cells outlines are distinct and intercellular bridges may be seen.
- Nuclei show considerable variation with giant nuclei and pleomorphism observed
- Calcification may be noted as well as amyloid like materials liesegang rings also may be present.

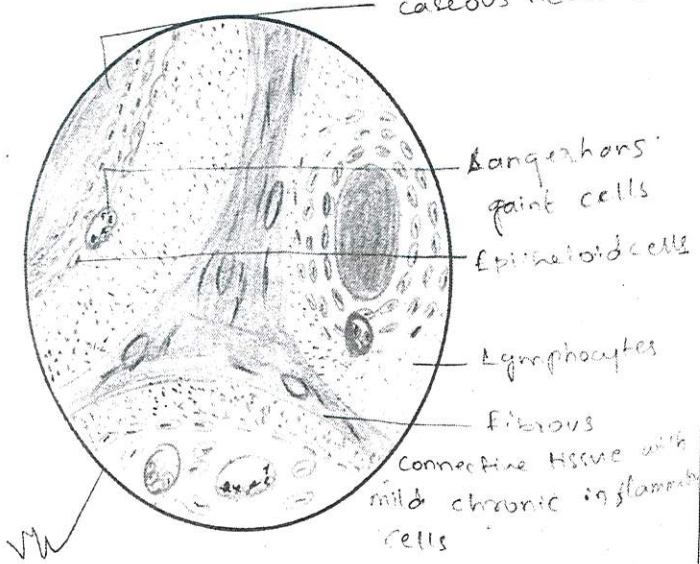
Pyogenic



PYOGENIC GRANULOMA

- Histological appearance of pyogenic granuloma is similar to that of granulation tissue except that it is exuberant and is well localized.
- pyogenic granuloma the overlying epithelium if present is generally thin and atrophic but may be hyperplastic.
- vast numbers of endothelium lined vascular spaces and extreme proliferation of fibroblasts and budding endothelial cells.
- There is intense infiltration of polymorphonuclear leukocytes lymphocytes & plasma cells.

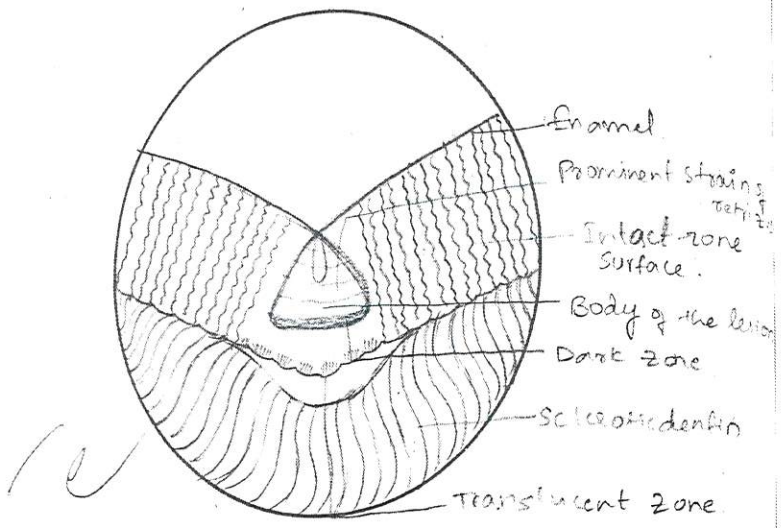
Tuberculous Lymphdenitis - VII. 1 -



TUBERCULOUS LYMPHDENITIS

- Tuberculous lesions in the mouth do not differ microscopically from tuberculous lesions in other organs of body.
- Histopathologic appearance is due to cell mediated hypersensitivity reaction.
- Formation of granuloma also called tubercle exhibits foci of caseous necrosis surrounded by epithelialioid cells. lymphocytes and occasionally multinucleated langhans giantcells.

Pit and fissure

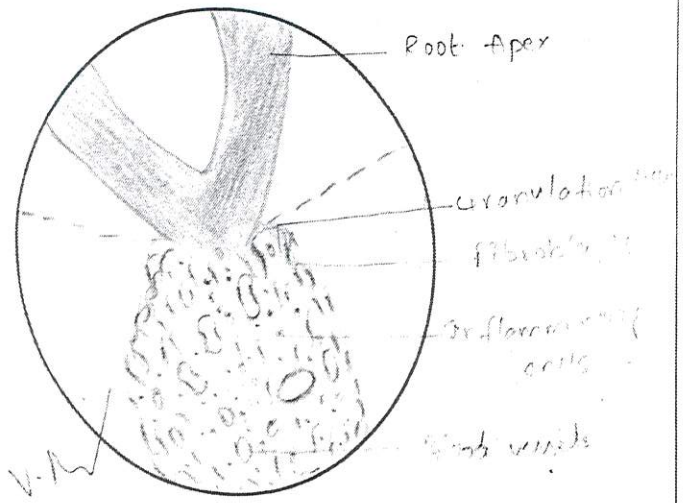


PIT AND FISSURE CARIES

* loss of inter-rod substance prominent around rods
* Appearance of transverse striations of enamel rods due segmental demineralization.
* carious process in pit and fissures does not differ in nature from smooth surface caries except for its anatomical and histological variations.
* Initial lesion has been divided into different zones based on its histological appearance

They are: i. translucent zone
ii. Dark zone
iii. Body of lesion
iv. surface layer.

Periapical Granuloma VIII



PERIAPICAL GRANULOMA.

* periapical granuloma is a localized mass of chronic granulation tissue formed in response to infection.
* Histopathologically - granulation tissue mass consists of proliferating fibroblasts, endothelial cells and numerous immature blood capillaries with bone resorption.
* It is relatively homogenous lesion composed of macrophages lymphocytes and plasma cells.
* plasma cells consists of Russel Bodies found extracellularly
* collection of cholesterol clefts with multinuclear giant cells.

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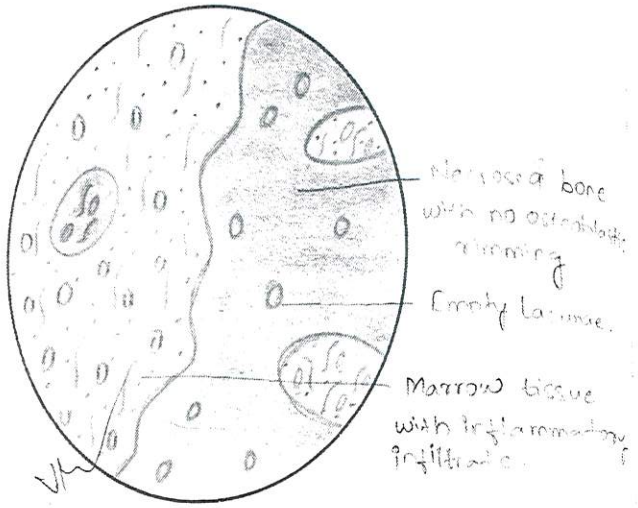
Osteomyelitis



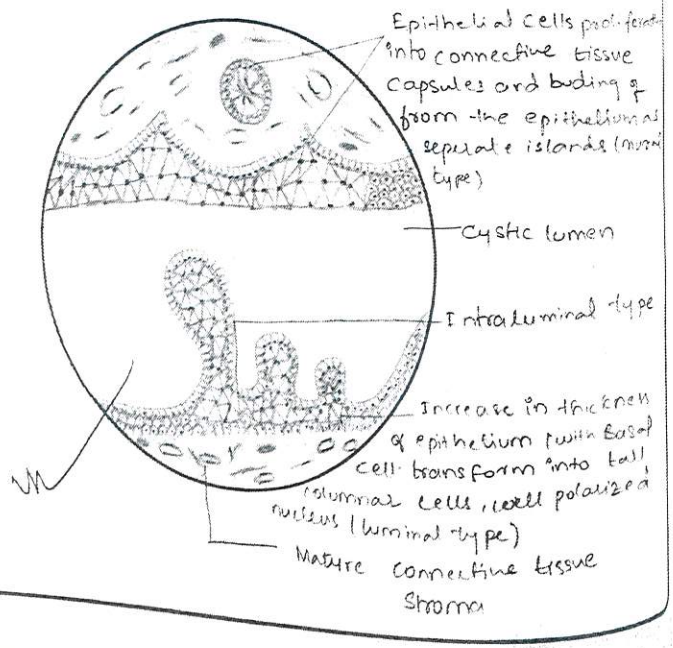
OSTEOMYELITIS

* Osteomyelitis means infection of medullary portion of bone.
* Inflammation process of the entire bone including the cortex and periosteum.

Histopathology :

* Osteoblasts bordering the bony trabeculae are destroyed.
* Trabeculae loose their viability and begin to resorp slowly.
* Little interstitial marrow is seen.
* Osteocytic lacunae are empty
* Interstitial marrow tissue filled with fibroblasts and small blood vessels.

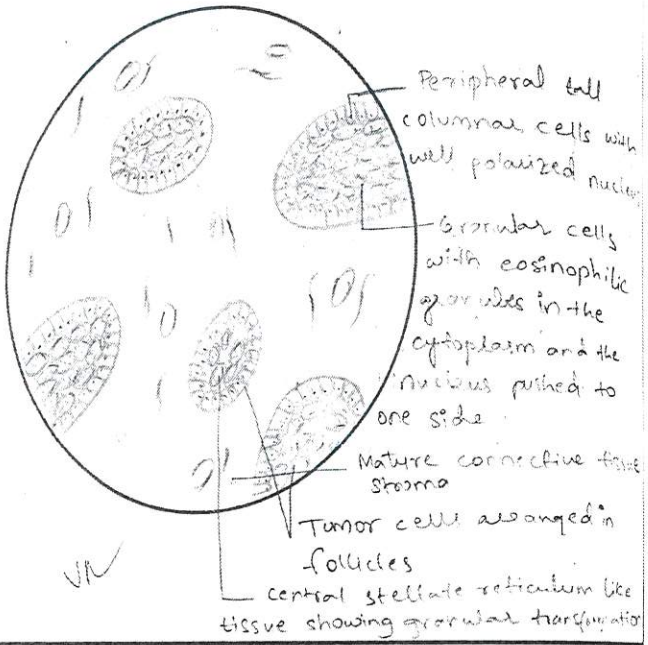
Unicystic Ameloblastoma



UNICYSTIC AMELOBLASTOMA.

- lining epithelium exhibiting alternations virtually identical with those described in vickers & Gorlin as representing early ameloblastomatous changes in dentigerous cyst.
- luminal unicystic ameloblastoma - tumor is confined to luminal surface of cyst
- mural unicystic ameloblastoma - growth of ameloblastomatous lining epithelium into connective tissue and invasive islands of ameloblastomatous epithelium.
- It consists of cystic cavity along with based layer of columnar cells displaying hyperchromic & palisaded nuclei.

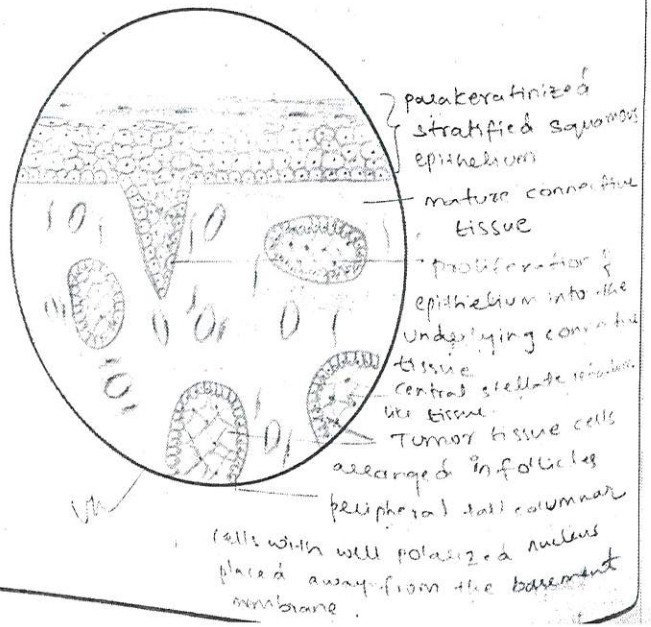
Granular cell Ameloblastoma



GRANULAR CELL AMELOBLASTOMA.

- marked transformation of the cytoplasm of the stellate reticulum like - cells, so that it taken on a very granular, eosinophilic appearance.
- These cytoplasmic granules represent lysosomal aggregates with no recognisable cellular components
- Lysosomal aggregation within the cytoplasm is called by dysfunction of either a lysosomal enzyme or lysosome associated protein involved in enzyme activation, enzyme targeting.
- Aggressive lesion with a marked proclinity for recurrence.

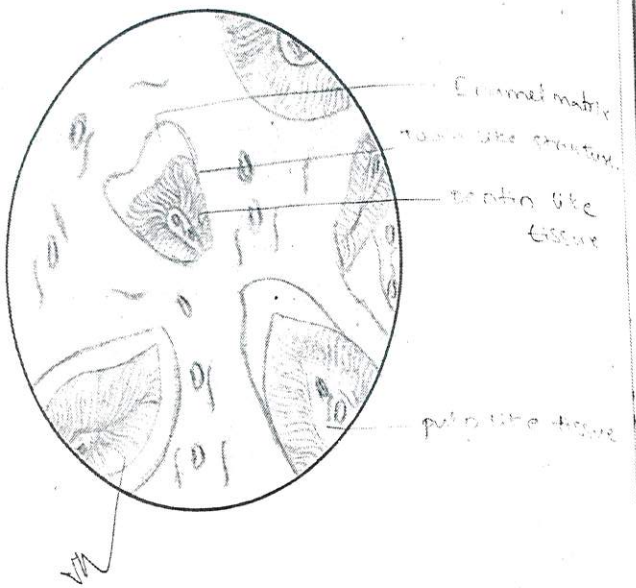
Peripheral Ameloblastoma



PERIPHERAL AMELOBLASTOMA

- May exhibit the same pattern seen in the ameloblastoma.
- Electron microscope appearance is similar to that of the intraosseous ameloblastoma and the cutaneous basal cell carcinoma.
- this tumor appears to originate from surface epithelium, remnants of dental lamina, pleuropotent basal cells of the mucosal epithelium or pleuropotent cells of minor salivary glands
- these tumor are extraosseous and therefore occupy the lamina propria underneath the surface epithelium but outside of the bone.

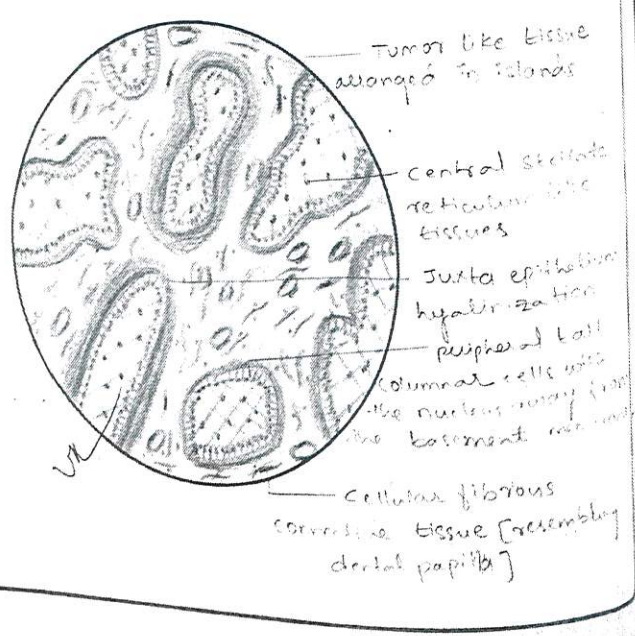
Compound Composite Odontoma



COMPOUND COMPOSITE ODONTOMA.

- odontoma refers to any tumor of odontogenic origin.
- The enamel and dentin are usually laid down in an abnormal pattern because the organization of odontogenic fells fails to reach the normal state of morphodifferentiation.
- This lesion is composed of more than one type of tissue and have called composite odontoma
- Normal appearing enamel or enamel matrix, dentin, pulptissue, and cementum which may or may not exhibit normal relation to another
- Entire tooth like structure is seen.

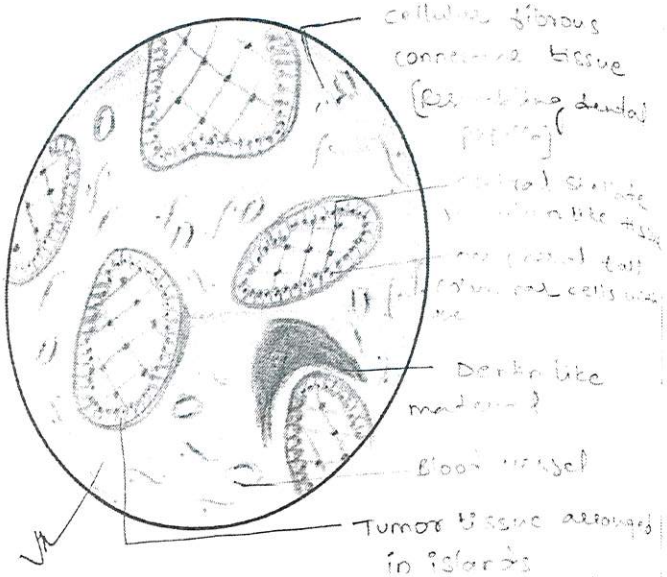
Ameloblastic fibroma



AMELOBLASTIC FIBROMA

- Ameloblastic fibroma consists of odontogenic ectomesenchyma resembling the dental papilla and epithelial strands and nests resembling dental lamina and enamel origin
- No dental hard tissues are present
- Neoplastic proliferation of epithelium (dental lamina)
- primitives mesenchymal components (dental papillae)
- Enamel, dentin and cementum not formed in this tumor.
- Islands with peripheral columnar epithelial cells surrounding loosely arranged epithelial cells resembling stellate reticulum.

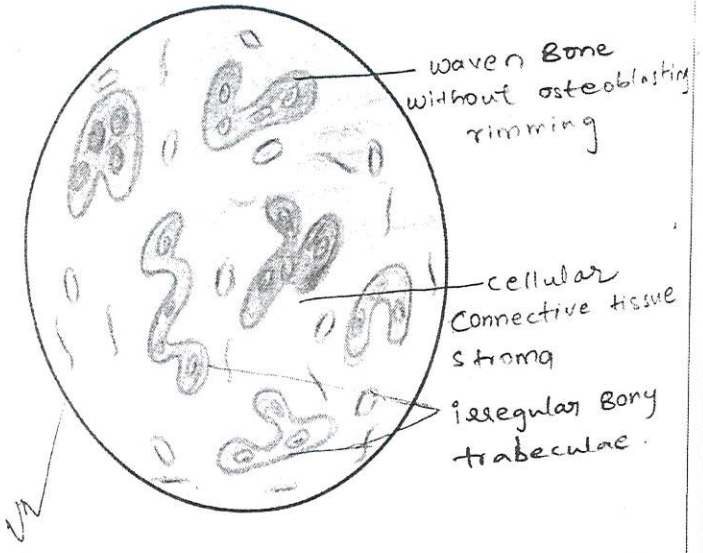
Ameloblastic fibro ...



AMELOBLASTOMA FIBRO DENTINOMA.

- Ameloblastic fibrodentinoma is a rare benign mixed odontogenic tumor.
- It is composed of odontogenic epithelium, immature connective tissue and is characterized by the formation of dysplastic dentin.
- proliferating odontogenic epithelium associated with ectomesenchymal cells arranged in strands, cords and islands.
- Areas of dentinoid and osteodentin formation preceeded by a zone of hyalinization.
- It is an intermediate stage between ameloblastic fibroma and ameloblastic odontoma.

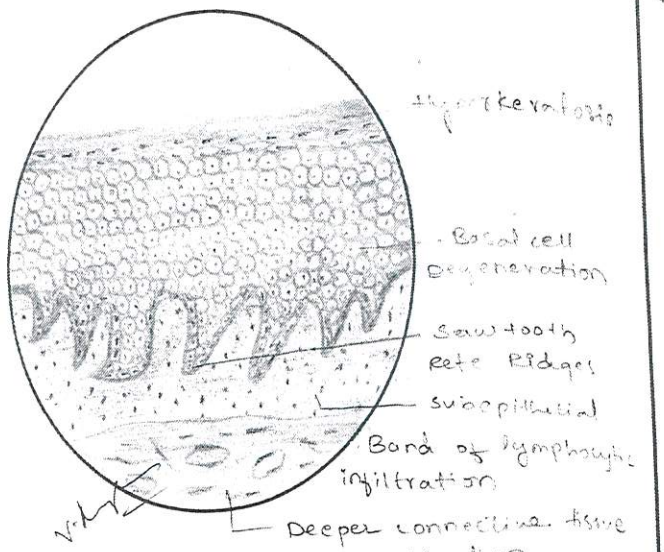
Fibrous Dysplasia



FIBROUS DYSPLASIA

* It is uncommon, non-hereditary, developmental anamoly of bone due to defect in osteoblastic differentiation and maturation.
* Numerous irregular c-shaped bony trabeculae can be seen not connected to each other
* Bony trabeculae is seen in chinese patteen
* Connective tissue consists of mononuclear cells resembling fibroblasts & progenitor osteoblasts
* Osteoblastic rimming of bony trabeculae is absent
* multiple delicate capillaries are found throughout lesion.

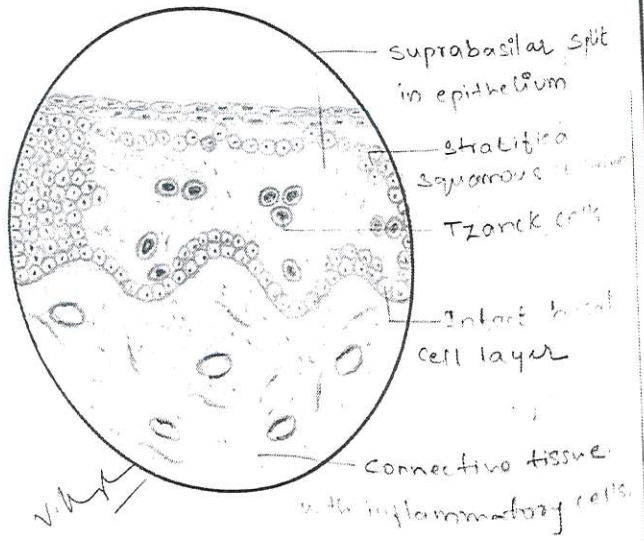
Lichen Planus



LICHEN PLANUS

* Hyperkeratosis with thickening of granular layer and acanthosis with intracellular edema of spinous cells.
* There is destruction of basal cells by liquefaction degeneration leading to development of saw tooth appearance of rete ridge.
* Band of Subepithelial mononuclear infiltrate consisting of T-cells & histiocytes are pacvent
* Histologic clefts (max Joseph spaces) may from blisters on the oral mucosa.
* civatte bodies appears as homogenous eosinophilic globules are seen

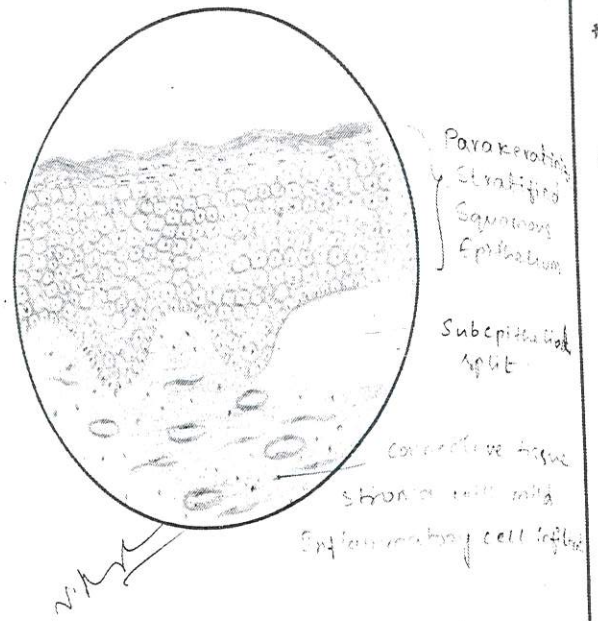
Pemphigus



PEMPHIGUS

* there is an intraepithelial blister formed by the process of acantholysis which is loss of normal cell to cell attrachment.
* This seperation of epithelial occurs above basal layer forming a space called supeabasilar split. This split produces a histologic patteen of row of tombstones.
* clumps of epithelial cells are found lying free within the vesicular space called Tzarck cells and are characterized by degenerative changes which include swelling of nuclei & hyperchromatic Staining.

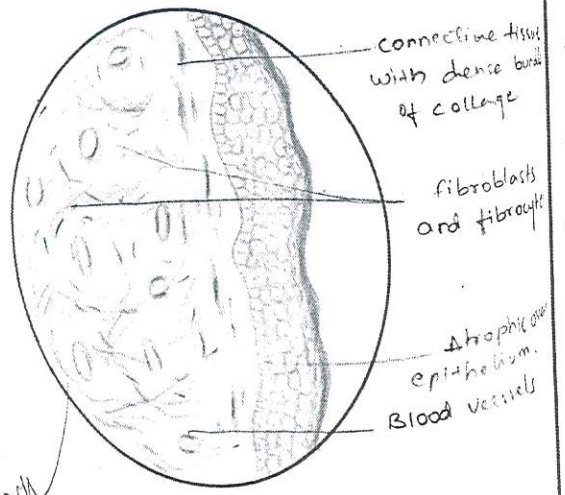
Pemphigoid



PEMPHIGOID

* Vesicles and bullae are subepideemal rather than suprabasilar.
* There is no evidence of acantholysis
* The basement membrane structure appears to detach with the epithelium from underlying connective tissue.
* Two types of pemphigoid are - cicatricial pemphigoid
  Bullous pemphigoid
* vesicles contain a fibrinous exudate admixed with occasional inflammatory cells.
* Connective tissue consists of lymphocytes, plasma cells & eosinophils.

fibroma.



FIBROMA

* It is the most common benign soft tissue neoplasm occuring in the oral cavity
* fibroma consists of bundles of interlacing collagen fibers.
* Varying numbers of fibroblasts or fibrocytes and small blood vessels
* Surface is made up of stratified squamous epithelium which appears stretched.
  - Shortening of rete pegs is seen
  - Inflammatory cell infiltration is present
  - Diffuse or focal calcification is found.

CERTIFICATE

This is to Certify that Mr. / Miss B. BHARGAVI has done the following Clinical Work in Dept. of Oral Medicine, Diagnosis & Radiology during the academic year 2023 - 2024.

1. Case Presentation 15 Short case history + 5 long case history
2. Radiographs 45 Intraoral periapical radiograph + 5 Bitewing radiograph.

His / Her work has been found satisfactory during the period.

Professor

Date : 12/08/2024.

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CASE SHEET

+ **Name** Santhosh **Date :** 14/03/23
+ **Address :** Mahabubnagar **Age :** 20 **Sex :** male
+ **Chief Complaint :** Patient complains of broken tooth in his upper front teeth region since 6 months back.
+ **History of Present Illness :** Patient was apparently asymptomatic 6 months ago then he noticed broken teeth in his upper front teeth region which was associated with trauma due to fall from bike with no aggrevating & relieving factors.
+ **History of Past Illness :**
+ **Medical & Drug History :** No relevant medical history & drug history
+ **Family History :** No relevant family history
+ **Personal and Social History :** Diet : mixed Bowel & Bladder : Regular Appetite : Normal : Sleep : Adequate

  (a) Marital Status : Unmarried.
  (b) Habits : NO.
  (c) Occupation : Student
  (d) Weight : 50 Kgs.

+ **Systems Review**
+ **CLINICAL EXAMINATION :**
+ **General Examination**
+ **General Appraisal**
  (Including Vital Signs when Indicated)
+ **Head :** **Skull** Normal
  Eyes Normal
  Nose Normal
+ **Skin :** No scars & rashes seen.
+ **Neck :**
+ **Jaws :**

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Intra Oral Examination :

(i) Lips : Competent

(ii) Labil / Buccal & Muscosa : Normal

(iii) Palate : Normal

(iv) Oropharynx : Normal

(v) Floor of the Mouth : Normal

(vi) Tongue : Normal

(vii) Gingiva :

(viii) Teeth :

(ix) Oclnsion :

(x) Edentrulous Mouth :

(xi) Partal Edentrulous Mouth

Local Examination of the Lesion :

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+ **Summary:** A 20 years old male patient by name Santhosh, student by occupatn came to department with complaints of broken tooth in upper front teeth region 6 months ago which was associated with trauma due to fall from the bike with no aggrevating & relieving factors. on soft tissue examinatn, gingiva is coral pink, firm & resilient, stippling present on Hard tissue examinatn total no of teeth are 31, missing teeth $+$, grossly decayed $+\frac{6}{6}$, Ellis class II $+\frac{1}{1}$, Ellis class III in $+\frac{2}{2}$, Ellis class I $+^{3}$, class I deep dentinal caries $+_{6}$, stains moderate, calculus mild. Based on above clinical findings it is provisionally diagnosed as chronic irreversible pulpitis $+\frac{6}{6}$.

+ **Provisional Diagnosis :**
1. chronic irreversible pulpitis irt $+\frac{6}{6}$
2. class I deep dentinal caries $+_{6}$
3. Ellis class III fracture $+^{2}$
4. Ellis class II fracture $+^{1}$
5. Ellis class I fracture $+^{3}$.

+ **Differential Diagnosis :**
1. Periapical cyst $+^{2}$
2. Periapical abscess $+^{16}$
3. periapical granuloma.

+ **Investigation :** RVG irt $+_{6}$.

+ **Final Diagnosis :**
1. periapical cyst $+^{2}$
2. periapical abscess irt $+^{16}$
3. ellis class I fracture $+^{3}$.
4. class I deep dental caries $+_{6}$.

+ **Treatment Plan** Advised Extraction irt $+^{26}$ & followed by replacement with fixed prosthesis
Advised root canal treatment $+^{1}$
Advised restoration irt $+\frac{3}{6}$.

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Signature of the Staff

Gingiva

colour : coral pink

Contour: scalloped

Consistency: firm & resilient

Surface texture : Stippling seen

Hard Tissue.

Teeth present : 31

Teeth absent : NIL

Decayed teeth : Grossly decayed $+\frac{6}{6}$.

Fractures :- Ellis class I $+^{3}$

ellis class II $+^{1}$

Ellis class III $+^{2}$

mobility :- Grade I $+_{11}$

Stains :- moderate

calculus :- mild

Radiographic findings :-

RVG reveals loss of crown structure involving enamel, dentin 1/t $+^{1}$, gross loss of crown structure involving enamel, dentin, pulp. Loss of lamina dura with ill defined radiolucency at apical 1/3rd of root 1/t $+^{2}$. RVG also reveals ill defined radiolucency at apical 1/3rd of m B root of $+^{5}$ & gross loss of crown structure involving enamel, dentin, pulp & loss of lamina dura at apical 1/3rd of root of $+^{6}$.

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ORAL MEDICINE, DIAGNOSIS & RADIOLOGY

CASE SHEET

+ **Name** Nazreen Begum **Date :** 18/03/23

+ **Address :** Habeeb Nagar **Age :** 32 **Sex :** Female

+ **Chief Complaint :** Patient complains of pain in her lower right back tooth region since 1 year.

+ **History of Present Illness :** Patient was apparently asymptomatic 1 year ago then she developed pain in her lower right back tooth region which was gradual in onset, intermittent in nature, severe intensity, throbbing type, non-radiating, aggrevates during night, temporarily relieves on medicati

+ **History of Past Illness :**

+ **Medical & Drug History :** No relevant medical & drug History

+ **Family History :** No relevant family history.

+ **Personal and Social History :** Diet : mixed Bowel & Bladder, Regular. Appetite : Normal. Sleep : Inadequate

  (a) Marital Status : Married
  (b) Habits : No
  (c) Occupation : House wife
  (d) Weight : 60 Kgs.

+ **Systems Review**

+ **CLINICAL EXAMINATION :**

+ **General Examination**

+ **General Appraisal**
  (Including Vital Signs when indicated)

+ **Head :** **Skull** Normal
  Eyes Normal
  Nose Normal

+ **Skin :** No scars & rashes seen.

+ **Neck :**

+ **Jaws :**

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Intra Oral Examination :

(i) Lips : competent

(ii) Labil / Buccal & Muscosa : Normal

(iii) Palate : Normal

(iv) Oropharynx : Normal.

(v) Floor of the Mouth : Normal

(vi) Tongue : Normal

(vii) Gingiva :

(viii) Teeth :

(ix) Ocinsion :

(x) Edentrulous Mouth :

(xi) Partal Edentrulous Mouth

Local Examination of the Lesion :

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+ **Summary:** A 32 years old female patient by name nazreen Begum, housewife by occupation, resident of Habeebnagar came to department with chief complaint of pain in her lower right back tooth region since 1 year and then she developed in her gradual in onset, intermittent in nature, severe intensity, throbbing type, non-radiating, aggrevates during night. On soft tissue examination gingiva is pale pink, scalloped, soft & edematous on Hard tissue examination no of teeth present are 32, no of decayed teeth class II Dental caries +5, Grossly decayed 6+, Grade I mobility 7521|12, vertical Top+ve 6+ stains mild, calculus moderate. Based on above clinical finding diagnosed as Apical periodontitis 6+, chronic generalised with localised 7521|12

+ **Provisional Diagnosis:** 1. Apical periodontitis irt 6+ 7521|12
2. Class II Dental caries irt +5
3. Chronic Generalised Gingivitis
Localized periodontitis irt 7521|12.

+ **Differential Diagnosis:** Periapical abscess
Periapical granuloma
Periapical cyst.

+ **Investigation:** Rvg irt 6+.

+ **Final Diagnosis:** 1. Endo perio lesion irt 6+.
2. class II dental caries irt +5
3. chronic Generalised gingivitis with Localised periodontitis irt 7521|12.

+ **Treatment Plan** (1) Advised Extraction irt 6+ followed by replacement of tooth with fixed prosthesis
(2) Restoration irt +5.
(3) Advised oral prophylaxis & periodontal therap

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Signature of the Staff

Gingiva

colour : Pale pink

contour : scalloped

Consistency : soft & edematous

-Hard Tissue

Teeth present : 32

Decayed teeth : class II dental caries +5

Grossly decayed 6+.

mobility :- Grade I $\frac{}{7521|12}$

Tenderon: Vertical TOp tve 6+
percussion

Radiographic findings :-

- RVG reveals gross loss of crown structure involving enamel, dentin & pulp.
- Widening of PDL space noticed all along the length of mesial root rt 6+.
- ill defined radiolucency at apical 1/3rd of mesial root 6+
- RVG also reveals loss of lamina dura at apical 1/3rd of root 6+.

Medications :-

Rx.

1. Tab AUGMENTIN - 625 mg — (9)
(Amoxicillin + clavulanic acid)
500mg 125mg
PO|TID|3days|after meals.
2. Tab. METRONIDAZOLE 400 mg — (6)
PO|BID|3days|after meals.
3. Tab. COMBIFLAM — (6)
IBUPROFEN + PARACETAMOL
400mg 325mg
PO|BID|3 days|after meals

4. Tab. PANTOP 40mg — (3)
(PANTOPRAZOLE 40mg)
PO|OD|3 days|before breakfast.

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ORAL MEDICINE, DIAGNOSIS & RADIOLOGY

CASE SHEET

+ **Name** Raziya Begum **Date :** 18/3/23

+ **Address :** Ganesh nagar **Age :** 40 **Sex :** Female

+ **Chief Complaint :** Patient complains of pain in her lower right back teeth region since 4 days.

+ **History of Present Illness :** Patient was apparently asymptomatic 4 years back then she developed pain in her lower right back teeth region which was sudden in onset, continuous in nature, throbbing type, radiating & with severe intensity, aggrevates on eating food & relieves on medication.

+ **History of Past Illness :**

+ **Medical & Drug History :** Patient is hypertensive for past 5 years & on medication.

+ **Family History :** No relevant family history.

+ **Personal and Social History :** Diet : mixed. Sleep : Adequate. Appetite : Normal Bowels Bladder : Regular.

  (a) Marital Status : married
  (b) Habits : No.
  (c) Occupation : Housewife
  (d) Weight : 60.

+ **Systems Review**

+ **CLINICAL EXAMINATION :**

+ **General Examination**

+ **General Appraisal**
  (Including Vital Signs when indicated)

+ **Head :** **Skull** Normal
  Eyes Normal
  Nose Normal

+ **Skin :** No scars & rashes seen.

+ **Neck :**

+ **Jaws :**

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Intra Oral Examination :

(i) Lips : Competent

(ii) Labil / Buccal & Muscosa : Normal

(iii) Palate : Normal

(iv) Oropharynx : Nomal.

(v) Floor of the Mouth : Normal

(vi) Tongue : Normal

(vii) Gingiva :

(viii) Teeth :

(ix) Ocinsion :

(x) Edentrulous Mouth :

(xi) Partal Edentrulous Mouth

Local Examination of the Lesion :

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+ **Summary:** A 40 years old female patient by name Raziya Begum housewife by occupation came to department with chief complaints of pain in her lower right back tooth region since 4 days which was sudden in onset, continuous in nature, throbbing type, radiating & with severe intensity aggravates on eating food & relieves on medication. Patient was known HTN for 5 years & on medication on soft tissue examination gingiva is red, attenuated, soft & edematous, bleeding on probing present, gingival recession generalised. On hard tissue examination no. of teeth present 30 missing teeth $\frac{1^8}{8}$, Grossly decayed teeth $\frac{87}{8}|\frac{7}{7}$, class I dental caries $\frac{}{87}$, Top rvc $\frac{87}{8}|\frac{7}{7}$ Based on above findings it is provisionally diagnosed as chronic generalised periodontitis, apical periodontitis $\frac{}{87}$.

+ **Provisional Diagnosis:**
1. Apical periodontitis $\frac{37}{8}|\frac{7}{7}$
2. class I dental caries $\frac{}{7}$.
3. chronic generalised perbodontitis
4. Ellis class IV irt $\frac{1}{1}$
5. ellis class II irt $\frac{}{12}$, Ellis class I irt $\frac{7}{\text{fracture}}$

+ **Differential Diagnosis:**
1. periapical abscess
2. periapical granuloma
3. periapical cyst

+ **Investigation:** OPG

+ **Final Diagnosis:**
1. Periapical abscess irt $\frac{87}{8}|\frac{7}{}$
2. Periapical granuloma irt $\frac{1}{1}$
3. Ellis class II fracture irt $\frac{}{12}$
4. chronic generalised periodontitis.

+ **Treatment Plan**
1. Advised Extraction $\frac{1}{1}$ followed by placemen
2. Advised Root canal therapy $\frac{87}{8}|\frac{7}{}$
3. Restoration irt $\frac{}{1}$
4. Periodontal therapy – chronic Generalised Periodontitis.

Medication:-

℞ 1. Tab. Amoxicillin — ④ x 3days.
500mg.
PO|TID|After meals|3days.

2. Tab. metronidazole — ④ x 3days.
400mg
PO|TID|after meals|3days.

3. Tab Zerodol. P — ⑥ x 3days.
PO|BID| after meals |3days.

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Gingiva

colour : Red.

Contour : attenuated

Consistency : soft & edematous.

Gingival recession : Generalised.

Hard Tissue

Teeth present : 38.

teeth absent : $\frac{8}{8|}$

Decayed teeth : $\frac{87|}{}$ 7 Grossly decayed.

class II dental caries $\frac{|}{87}$.

Fractures : ellis class IV fracture $\frac{1}{|}$

class II fracture $\frac{|1}{}$

class I fracture $\frac{2}{|}$.

mobility : Grade I $\frac{|}{21}$

TOP : vertical TOP +ve $\frac{87|7}{8}$.

Radiographic findings :-

OPG reveals permanent set of dentition with generalised horizontal bone loss with impacted left canine, with gross loss of crown structure, radiolucency involving enamel, dentin, pulp. widening of PDL space, ill defined radiolucency at apical 1/3rd of root rt $\frac{}{47}$. It also reveals distoocclu radiolucency involving enamel, dentin, pulp rt $\frac{8}{8}$. loss of crown structure involving enamel, dentin & pulp & well defined radiolucency seen on apical 1/3rd of root $\frac{1}{|}$. loss of enamel $\frac{1}{|}$, loss of enamel & dentin $\frac{|1}{}$.

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ORAL MEDICINE, DIAGNOSIS & RADIOLOGY

CASE SHEET

+ **Name** Annapurna. **Date:** 20/3/2023.
+ **Address:** 40-years Kosgi **Age:** 40 **Sex:** Female.
+ **Chief Complaint:** Patient complains of sensitivity in her lower right back tooth region from 3 years.
+ **History of Present Illness:** Patient was apparently asymptomatic 3 years back & then she developed sensitivity in lower right back tooth region while taking cold & sweet food items which is not associated with any pain
+ **History of Past Illness:** -
+ **Medical & Drug History:** No relevant medical & drug history
+ **Family History:** No relevant family history.
+ **Personal and Social History:** Diet: mixed Sleep: Normal. Appetite: Normal. Bowels & Bladder: Normal.
  - **(a) Marital Status:** Married
  - **(b) Habits:** No
  - **(c) Occupation** Housewife
  - **(d) Weight** 60kgs.
+ **Systems Review**
+ **CLINICAL EXAMINATION:**
+ **General Examination**
+ **General Appraisal**
  (Including Vital Signs when indicated)
+ **Head:** **Skull** Normal
  Eyes Normal
  Nose Normal.
+ **Skin:** No scars & rashes seen.
+ **Neck:**
+ **Jaws:**

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Intra Oral Examination :

(i) Lips : Competent

(ii) Labil / Buccal & Muscosa : Normal.

(iii) Palate : Normal

(iv) Oropharynx :

(v) Floor of the Mouth : Normal

(vi) Tongue : Normal

(vii) Gingiva :

(viii) Teeth :

(ix) Oclnsion :

(x) Edentrulous Mouth :

(xi) Partal Edentrulous Mouth

Local Examination of the Lesion :

Summary

A 40 years old patient named Annapurna a housewife resident of Kosgi came to department with chief complaints of sensitivity in lower back tooth region since 3 years which taking cold & sweet food items which is not associated with pain. On soft tissue Examination, colour of gingiva is red, rolled out margin $\frac{23}{3}|\frac{23}{3}$, soft & edematous, & localised bleeding on probing $\frac{}{21}|\frac{}{12}$, Grade I gingival recession $\frac{}{3}|\frac{23}{3}$. On Hard Tissue Examination. no. of teeth present 30, missing teeth $\frac{8}{}|\frac{7}{}$, class II dental caries $\frac{6}{}|\frac{8}{}$, Root stumps $+\frac{}{6}$, mobility grade I $\frac{}{21}|\frac{}{12}$ with generalised attrition, angle's class I malocclusion, vertical Top tve $\frac{6}{}|\frac{8}{}$

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+ **Summary :**
occlusal wear facets. Based on above clinical findings it is provisionally diagnosed as apical periodontitis $\frac{6|8}{}$ grossly decayed 7+, Root stumps +6, chronic generalised gingivitis with localised periodontitis $\frac{321|123}{}$.

+ **Provisional Diagnosis :**
1. Apical periodontitis $\frac{6|8}{}$
2. Grossly decayed 7+
3. Root stumps +6.
4. Chronic Generalised gingivitis with localised periodontitis $\frac{321|123}{}$

+ **Differential Diagnosis :**
1. periapical abscess.
2. Periapical granuloma.
3. periapical cyst.

+ **Investigation :** Advised OPG.

+ **Final Diagnosis :**
1. Chronic periapical abscess $\frac{6|8}{}$.
2. Grossly decayed 7+
3. chronic generalised gingivitis with localised periodontitis $\frac{321|123}{}$.

+ **Treatment Plan** ① Advised Root canal treatment $\frac{7|6}{}$ followed by crown placement.
② Advised Extraction +6 followed by replacement with fixed prosthesis.
③ Advised oral prophylaxis.

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Signature of the Staff

Gingiva

Colour : Red

Contour : Rolled out margins $\frac{-}{3}|\frac{23}{3}$

Consistency : Soft & edematous.

Bleeding on probing : localized Irt $\frac{-}{21}|\frac{-}{12}$.

Gingival recession : Grade I $\frac{-}{3}|\frac{23}{3}$.

Hard Tissue

Teeth present : 30

Teeth absent : $\frac{8}{}|\frac{}{7}$.

Decayed teeth :- Class II dental caries $\frac{6}{}|\frac{}{8}$.

Grossly decayed 7+.

mobility : Grade I $\frac{-}{21}|\frac{-}{12}$.

Root stumps :- +6.

Top : Vertical Top +ve $\frac{6}{}|\frac{}{8}$.

Radiographic findings

OPG reveals permanent set of dentition. gross loss of crown structure involving enamel, dentin & pulp 7+, mesioocclusal radiolucency involving enamel, dentin, pulp 6+, loss of pdl space noticed at apical 1/3rd of mesiobuccal root 6+, suggestive of periapical abscess $\frac{6}{}|\frac{}{8}$.

Root stumps +6.

Medications :-

① Tab. Amoxicillin 500mg. — ④ x 3 days.

Po | TID | after meals | 3 days.

② Tab. metronidazole (400mg) — ① x 3 days.

Po | TID | after meals | 3 days.

③ Tab. Zerodol-P — ⑥ x 3 days.

Po | BID | after meals | 3 days.

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CASE SHEET

+ **Name** Sulochana. **Date:** 21/3/23.
+ **Address:** Mahabubnagar **Age:** 35 **Sex:** Female.
+ **Chief Complaint:** Patient complains of pain in her lower right back tooth region since 1 week.
+ **History of Present Illness:** Patient was apparently asymptomatic 1 week back then she developed pain in her lower right back tooth region which was sudden in onset, continuous in nature, throbbing type, severe intensity, radiating, aggravates on eating & relieves on its own.
+ **History of Past Illness:** -
+ **Medical & Drug History:** No relevant medical & drug history.
+ **Family History:** No relevant family history.
+ **Personal and Social History:** Appetite: Normal Bowel & Bladder: Normal Diet: mixed. Sleep: Normal.

  (a) **Marital Status:** married
  (b) **Habits:** No.
  (c) **Occupation** House wife.
  (d) **Weight** 50 Kgs.

+ **Systems Review**
+ **CLINICAL EXAMINATION:**
+ **General Examination**
+ **General Appraisal**
  (Including Vital Signs when indicated)
+ **Head:** **Skull** Normal
  Eyes Normal
  Nose Normal
+ **Skin:** No rashes & scars seen.
+ **Neck:**
+ **Jaws:**

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Intra Oral Examination :

(i) Lips : Competent

(ii) Labil / Buccal & Muscosa : Normal

(iii) Palate : Normal

(iv) Oropharynx :

(v) Floor of the Mouth : Normal

(vi) Tongue : Normal

(vii) Gingiva :

(viii) Teeth :

(ix) Ocinsion :

(x) Edentrulous Mouth :

(xi) Partal Edentrulous Mouth

~~Local Examination of the Lesion :~~

Summary

A 35 years old female patient named sulochana resident of mahabubnagar came to department with chief complains of pain in her lower right back tooth region which was sudden in onset, continuous in nature, severe intensity, aggravates on eating & relieves on its own. On soft tissue Examination colour of gingiva is pale pink, rolled out margins $\frac{-}{2}\frac{|3}{12}$, soft & edematous, Stippling present & gingival recession $\frac{-}{2}\frac{|3}{12}$, on Hard tissue Examination no. of teeth present 82, class II dental caries $\frac{7}{54}\frac{|4}{}$, class I dental caries $\frac{18}{6}$, Root stumps $\frac{65}{7}\frac{|56}{5678}$, generalised attrition & abrasion

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+ **Summary :**

Vertical Top tve $\frac{\quad}{654}$. On clinical findings it is diagnosed as apical periodontitis $\frac{\quad}{654}$, class I dental caries $\frac{\quad}{6}$ & class II dental caries $\frac{7}{54}$, & Root Stumps $\frac{65 \mid 56}{87 \mid 5678}$.

+ **Provisional Diagnosis :**

1. Apical periodontitis $\frac{\quad}{654}$
2. class II dental caries $\frac{7}{54}$
3. class I dental caries $\frac{\quad}{6}$
4. Root stumps $\frac{65 \mid 56}{7. \mid 5678}$

+ **Differential Diagnosis :**

1. periapical abscess.
2. periapical granuloma.
3. periapical cyst.

+ **Investigation :** Advised OPG.

+ **Final Diagnosis :**

1. chronic periapical abscess $\frac{65 \mid 56}{7654 \mid 5678}$
2. class II dental caries. $\frac{7}{\quad}$.
3. class I dental caries $\frac{8}{\quad}$.

+ **Treatment Plan :**

1. Advised Root canal Treatment $\frac{\quad}{654}$ followed by crown placement
2. Advised Extraction $\frac{65 \mid 56}{7 \mid 5678}$ followed by replacement with fixed prosthesis.

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Signature of the Staff

Gingiva

Colour :- Red. $\frac{3}{2|12}$

Contour : Rolled out margins $\frac{3}{2|12}$

Consistency :- Soft & edematous

Gingival recession :- Grade I $\frac{3}{2|12}$

Hard Tissue

Teeth present : 32.

Decayed teeth :- class II dental caries $\frac{7}{54}$

class I dental caries $\frac{8}{6}$

Root stumps :- $\frac{65|56}{7|5678}$

Attrition & abrasion :- Generalised

TOP :- Vertical TOP +ve $\frac{}{654}$

Radiographic findings

- OPG reveals permanent set of dentition with moderate generalized horizontal alveolar bone loss generalized attrition, Root stumps $\frac{65|56}{7|5678}$.
- occlusal radiolucency involving enamel, dentin & pulp $\frac{1}{}$.
- mesio-proximal radiolucency involving enamel, dentin & pulp $\frac{7}{5}$.
- Disto-proximal radiolucency involving enamel, dentin approaching pulp $\frac{}{4}$.
- occlusal radiolucency involving enamel & a part of dentin $\frac{}{6}$.
- ill defined radiolucency noticed at apical 1/3rd of root $\frac{}{5}$.

medications

① Tab Amoxicillin — ⑥ x 3days
500mg.
PO | TID | after meals | 3 days.

② Tab. metronidazole — ⑥ x3 days
400mg.
PO | TID | after meals | 3 days

③ Tab. Zerodol-P — ⑥ x3 days
PO | BID | after meals | 3 days

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RADIOGRAPHS

Sl. No.	Date	Name	Age / Sex	Type of Radiographs	Interpretation	Sign. of Staff
1	20/3/23	Venkatamma	40/F	IOPA	Apical periodontitis irt $\frac{5}{6}$ + class I moderate dental caries irt $\frac{7}{7}$ +	
2	20/3/23	B.alaraj	45/M	1O PA	chronic Periapical abscess $\frac{}{6}$ +	
3	20/3/23	Bujji	33/F	1OPA	chronic periapical granuloma $\frac{5}{5}$ +	
4	20/3/23	Manyamma	35/F	1OPA	Radicular cyst $\frac{12}{}$ +	
5	20/3/23	Kurmaiah	35/M	1OPA	Endoperio lesion irt $\frac{}{6}$ +	
06	20/3/23	Asma Begum	27/F	1OPA	Chronic periapical abscess irt $\frac{1}{11}$ +	Syamm
7	21/3/23	Shivamma	30/F	1OPA	chronic periapical abscess $\frac{}{6}$ +	
8	21/3/23	Rama Krishna	15/M	1OPA	Apical Periodontitis irt $\frac{6}{}$ + vertical impaction irt $\frac{8}{}$ +	
9	21/3/23	Rama Krishna	15/M	1OPA	chronic periapical abscess irt $\frac{}{6}$ +	
10	22/3/23	Asma Begum	33/F	1OPA	Endo perio lesion $\frac{}{6}$ + Mesioangular Impaction irt $\frac{}{8}$ +	

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RADIOGRAPHS

Sl No	Date	Name	Age / Sex	Type of Radiographs	Interpretation	Sign. of Staff
11.	23/3/23	Shiva	25/M	IOPA	Apical periodontitis irt $\frac{+}{6}$ Moderate dental caries irt $\frac{+}{7}$	Jyam
12.	23/3/23	Shiva	29/M	IOPA	Chronic Periapical abscess irt $\frac{+}{6}$.	
13.	23/3/23	Vishwa	28/M	IOPA	Periapical granuloma irt $\frac{+}{5}$	
14.	23/3/23	Naresh	32/M	IOPA	Endoperiolesion irt $\frac{+}{1}$	
15	23/3/23	Sudha	29/F	IOPA	Periapical granuloma irt $\frac{+}{6}$	
16.	25/3/23	Raghu	26/M	IOPA	chronic Periapical abscess irt $\frac{+}{7}$ Horizontal impaction irt $\frac{+}{8}$	
17.	25/3/23	Savitha	18/F	IOPA	Apical periodontitis irt $\frac{+}{7}$ Horizontal impaction irt $\frac{+}{8}$.	
18.	25/3/23	Ananthamma.	47/F	IOPA	Radicular cyst $\frac{+}{5}$ Partially edentulous area $\frac{+}{2346}$.	

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RADIOGRAPHS

Sl. No.	Date	Name	Age / Sex	Type of Radiographs	Interpretation	Sig S
19.	25/3/23	Sai vamshi	24/M	IOPA	Radicular cyst 24	
20.	25/3/23	Rohit	27/M	IOPA	Chronic Periapical abscess irt 48.	
21.	27/3/23	Meghana	29/F	IOPA	Endoperio lesion irt 16.	
22.	27/3/23	Rajamani	51/F	IOPA	Chronic Periapical abscess irt 16.	
23.	27/3/23	Karthik	31/M	IOPA	Perio Endo Lesion 46.	
24.	27/3/23	Ramesh	23/M	IOPA	Chronic Periapical abscess irt 47. Mesioangular impaction irt 48	
25.	27/3/23	Shiva	25/M	IOPA	class II moderate dental caries 47	
26.	28/3/23	Afreen	30/F	IOPA	Endo perio Lesion irt 17.	
27.	28/3/23	Sana	20/F	IOPA	Class II moderate dental carries irt 16.	

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RADIOGRAPHS

Sl No	Date	Name	Age / Sex	Type of Radiographs	Interpretation	Sign of Staff
28	28/3/23	Manoj	23/M	10PA	Periapical abscess irt $\frac{1}{1}$	
29	28/3/23	Narsimlu	35/M	10PA	Chronic Periapical abscess irt $\frac{2}{}$	
30	28/3/23	upendra.	42/M	10PA	Severe dental caries irt $\frac{21}{}$ chronic periapical abscess irt $\frac{1}{1}$.	
31.	29/3/23	Tasawar	27/F	10PA	Periapical abscess irt $\frac{1}{6}$.	
32.	29/3/23	Balaiah.	24/M	10PA	Apical periodontitis $\frac{1}{1}$.	
33.	29/3/23	Sheema.	27/F	10PA	Chronic periapical abscess irt $\frac{1}{67}$.	
34.	29/3/23	Shruthi.	25/F	10PA	Chronic Periapical abscess irt $\frac{1}{6}$.	
35.	29/3/23	Ravi.	30/M	10PA	Chronic Periapical abscess irt $\frac{1}{6}$.	

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ORAL MEDICINE, DIAGNOSIS & RADIOLOGY

RADIOGRAPHS

Sl. No.	Date	Name	Age / Sex	Type of Radiographs	Interpretation	Sign. of Staff
36	31/3/23	Umadevi	38/F	IOPA	chronic periapical abscess 6┘ Moderate class II dental caries 57┘	
37.	31/3/23	Ghousiya Begum	28/F	IOPA	Moderate class II dental caries 6┘	
38	31/3/23	Shiva Kumar	35/M	IOPA	Periapical abscess irt 7┘	
39.	31/3/23	Narsimlu	30/M	IOPA	chronic Periapical abscess irt └7	
40.	31/3/23	Srinu	26/M	IOPA	Periapical abscess irt 5┘	
41.	03/3/23	Naresh.	31/M	IOPA	chronic periapical abscess irt 6┘	
42.	03/3/23	Hajera Begum.	34/F	IOPA	Endo perio Lesion irt └6.	

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RADIOGRAPHS

Sl No	Date	Name	Age / Sex	Type of Radiographs	Interpretation	Sign of Staff
43	3/3/23	Radha	35/F	IOPA	Chronic Periapical abscess irt $\frac{+}{6}$.	
44	3/3/23	Sujatha.	30/F	IOPA	Periapical granuloma $\frac{+}{5}$	
45	03/3/23	Shiva	35/M	IOPA	Endoperio Lesion irt $\frac{+}{7}$.	
46	24/06/24	Ramesh	28/M	Bitewing radiography	mild class II distoproximal dental caries $\frac{+}{4}$ Mild class I dental caries $\frac{+}{7}$	
47	24/06/24	usha	24/F	Bitewing radiography	mild distoproximal class II Dental caries $\frac{+}{5}$ mild mesioproximal class II dental caries $\frac{+}{6}$.	
48	25/06/24	Pandu	30/M	Bitewing radiography	Mild distoproximal class II dental caries $\frac{+}{5}$	
49	25/06/24	Satwik	29/M	Bitewing radiography.	Mild distoproximal class II dental caries $\frac{+}{5}$ mild mesioproximal dental caries $\frac{+}{6}$	

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ORAL MEDICINE, DIAGNOSIS & RADIOLOGY

RADIOGRAPHS

Sl No	Date	Name	Age / Sex	Type of Radiographs	Interpretation	Sign. of Staff
50.	26/06/20	Bharath	24	Bitewing Radiographs.	Mild distoproximal class II caries in relation to 45. mild mesioproximal class II dental caries in relation to 46.	

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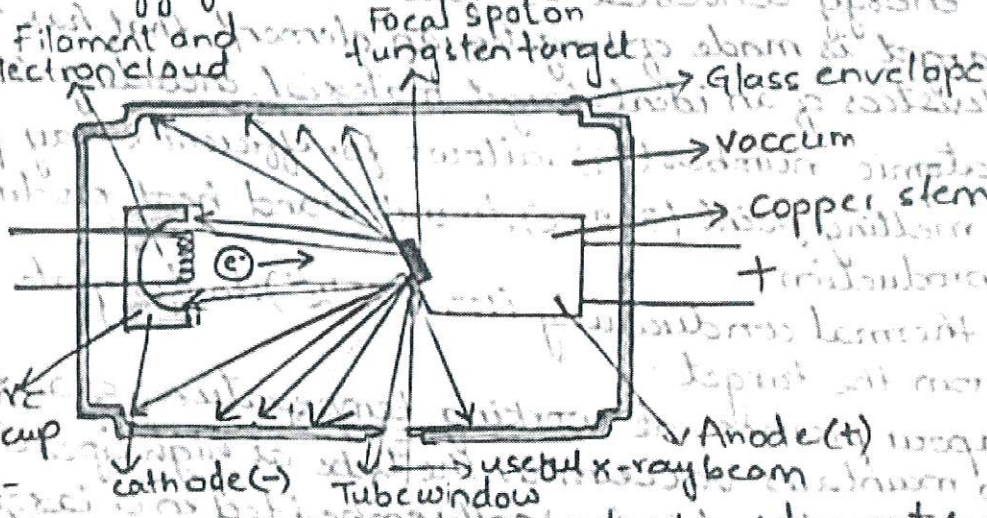
X-RAY MACHINE

X-ray machines produce x-ray that pass through a patient's tissue & strike a digital receptor or film to make a radiographic image. The primary components of an x-ray machine are the x-ray tube & its power supply positioned with in the tube head.

- For intra oral x-ray units, the tube head is typically supported by an arm that is mounted on a wall.
- A control panel allows the operator to adjust duration of exposure & often energy & exposure rate of x-ray beam.
- The tube is recessed within tube head to increase the source to object distance & minimize distortion.

X-Ray tube :-

It is composed of a cathode & an anode situated within an elevated glass envelope or tube. To produce x-rays, electrons stream from the filament in the cathode to the target in the anode where the energy from some of the electrons is converted into x-rays.



Cathode :-

- The cathode is an x-ray tube consists of a filament & a focusing cup
- The filament is the source of electrons within x-ray tube. It is a coil of tungsten wire approx. 2mm in diameter & 1 cm or less in length. Filament typically contain appro. 1% thorium which generally increases the release of electrons from the heated wire.
- The filament is heated to incandescence with a low-voltage source & emits electrons at a rate proportional to the temperature of the filament.

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The filament lies in a focusing cusp, a negatively charged concave molybdenum bowl. The parabolic shape of the focusing cusp electrostatically focuses electrons emitted by filament into a narrow beam directed at a small rectangular area on the anode called the focal spot

- The electrons move to the focal spot because they both repelled by negatively charged cathode & attracted to positively charged anode.
- The x-ray tube is evacuated to prevent collision of fast moving electrons with gas molecules which reduces their speed. The vaccum also prevent oxidation or burnout of the filament.

Anode :-

- The anode is an x-ray tube consists of tungsten target embedded in copper stem. The purpose of the target is an x-ray tube is to convert kinetic energy of colliding electrons into x-ray photons. It is an efficient process with more than 99% of electron kinetic energy converted to heat.
- The target is made of tungsten, an element that has several characteristics of an ideal target material, including the following:

* High atomic number (74), allows for efficient x-ray production.
+ High melting point (3422°C), to withstand heat produced during x-ray production.
* High thermal conductivity (173 $W m^{-1} k^{-1}$), to dissipate heat produced away from the target.
+ Low vapour pressure at working temperatures of an x-ray tube, to help maintain vaccum in the tube at high operating temp.

- The tungsten target is typically embedded in a large block of copper which functions as a thermal conductor to remove heat from tungsten, reducing the risk of target melting.
- The focal spot is area on target to which the focusing cup directs the electrons & from which x-rays are produced. The size of focal spot is an imp. technical parameters of image quality - a smaller focal spot yeilds a sharper image. A limitation to reducing focal spot is the heat generated
- To overcome this limitation x-ray tubes use one of two anode configurations

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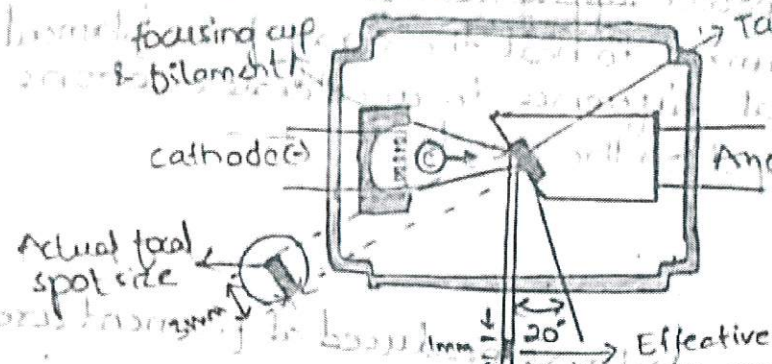
Stationary anode:

In this target is placed at an angle to electron beam. Typically, target is inclined approximately 20° to the central ray of the x-ray beam.



When viewed through aiming ring, the area from which Photons of useful x-ray beam originate appears smaller, making the effective focal spot smaller than actual focal spot size.

- In the example shown, the effective focal spot is approximately 1mm x 1mm as opposed to the actual focal spot, which is app. 1 mm x 3mm. This smaller effective focal spot results in small apparent source of x-rays & an increase in sharpness of image, with larger actual focal spot size to improve heat dissipation.

Rotating anode:-

- In this, the tungsten target is in the form of beveled disk that rotates during period of x-ray production. As a result, the electron strikes successive areas of target disk, distributing the heat over this extended areas of disk.
- x-ray tubes with rotating anode can be used with longer exposures & with higher tube currents of 100 to 500 mA, which is 10 to 50 times that possible with stationary targets.
- The targets & rotor (armature) of motor lie within x-ray tube & stator coils (which drive the rotor at approx. 3000 revolutions per minute) lie outside the tube.
- Such rotating anode are not used in intra oral dental x-ray machines but are occasionally used in cephalometric units; are usually used in cone beam machines & are used in multidetector CT x-ray machines, which requires high radiation output for longer, sustained exposure.

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Power supply:-

The x-ray tube & two transformers lie within an electrically grounded metal housing called the head of x-ray machine.

- The primary functions of power supply transformers are to;
  - Provide a low voltage current to heat the x-ray tube filament.
  - Generate a high potential difference to accelerate electrons from cathode to focal spot on the anode.

X-Ray Tube controls:-

Tube Current (Milliamperes), MA):

- During x-ray production, electrons produced at filament are attracted to anode.
- This flow of electrons from cathode to anode generates current across x-ray tube & is called the tube current.
- The magnitude of this current is regulated by the milliampere control which adjusts the resistance & current flow through filament, thereby regulating the no. of electrons produced.
- For many intra oral dental x-ray units, the mA setting is fixed, typically at 7 to 10 mA. Some units offer the flexibility of a selection of mA settings, ranging from 2 to 10 mA.

Tube voltage (kilovoltage, KV):

- A high voltage is required between anode & cathode to give electrons sufficient energy to generate x-rays.
- The kilovolt peak (KVp) selector adjusts the high-voltage transformer to boost peak voltage of incoming line current (110 or 220 V). Typically intra oral, panaromic, cephalometric machies operates between 50 & 90 KVp (50,000 to 90,000 V), where as computed tomographic machines operate at 90-120 KVp & highes.

Alternating current x-ray Generations:-

- For an incoming line with alternating current (AC), the polarity of line current alternates & polarity of x-ray tube alternates at same frequency.
- When polarity of voltage applied, the target anode to be positive & filament to be negative, the electrons around filament accelerate toward positive target & x-rays are produced.

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- when the voltage across cathode & anode is highest, the efficiency of x-ray production is highest & thus, intensity of x-ray pulses peaks at the centres of each cycle.
- During the following half of each cycle, the filament becomes positive & target becomes negative. At these times, the electrons do not flow across the gap between two elements of the tube & no x-rays are generated.
- when an x-ray tube is powered with 60 cycle AC, 60 pulses of x-rays are generated each second, each having duration of 1/120 sec. Such x-ray units are referred to as self rectified or half wave rectified.

Constant potential (Direct current) X-ray Generators :-
- Some dental manufacturers produce machines that replace conventional 60 cycles AC, half wave rectified power supply with high frequency power supply that provides almost DC.
- This results in constant potential between anode & cathode & x-rays are produced through entire cycle.
- Practical implications with use of constant potential intraoral x-ray are produced through entire cycle.
- Because x-ray production occurs during the entire voltage cycle, constant potential units requires shorter exposure times to produce same number of x-ray photons, minimizes patient motion
- The intensity of x-ray photons produced is more consistent & reliable especially with short exposure times. This is of practical importance when using digital receptors that requires less radiation.
- when operated at same KVP, the x-ray beam produced by constant potential units has higher mean energy, which decreases radiographic image constrast. To offset this effect Constant potential x-ray units are typically operated at slightly lower KVP, typically 60 to 65 KVP.
- The narrower spectrum of energies with fewer lower-energy photons, lowers the patient radiation dose by 35% to 40%. Compared with conventional AC x-ray generators.

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Timer:-

- A timer is built into high-voltage circuit to control duration of x-ray exposure
- The electronic timer controls length of time that high voltage is applied to tube & thus time during which x-rays are produced.
- Subjecting filament to continuous heating at normal operating current shortens its life. To minimize filament damage, the timing circuit first sends a current through filament for approximately half a second to bring it to proper operating temperatures & then applies power to high voltage circuit.
- In some circuit designs, a continuous low level current passing through filament maintains it at safe low temperatures, further shortening the delay to preheat the filament.
- Some x-ray machines timers display exposure time in fraction of a second. In some, exposure timers are preset for different anatomic areas of the jaws.
- In some units, the exposure time is expressed as no. of pulses in an exposure. The no. of pulses divided by 60 gives exposures time in seconds
- A setting of 30 pulses means 30 pulses of radiation equivalent to 0.5 - sec exposure

Tube rating & Duty cycle :-

- The heat buildup at anode is measured in heat units (HU), where HU = KVp x mA x seconds. The heat storage capacity for anodes of dental diagnostic tubes is approximately 20 KHU.
- Each x-ray machine comes with tube rating chart that describes longest exposure time the tube can be energized for a range of voltages (KVp) & tube current (mA) values without risk of damage to target from overheating.
- These tube ratings generally do not restrict tube use for intraoral radiographs.
- Duty cycle relates to frequency with which successive exposure can be made without overheating the anode.
- The interval b/w successive exposure must be long enough for heat dissipation.
- The characteristic is function of size of anode, the exposure KVp & mA & the method used to cool the tube. A d... [illegible]

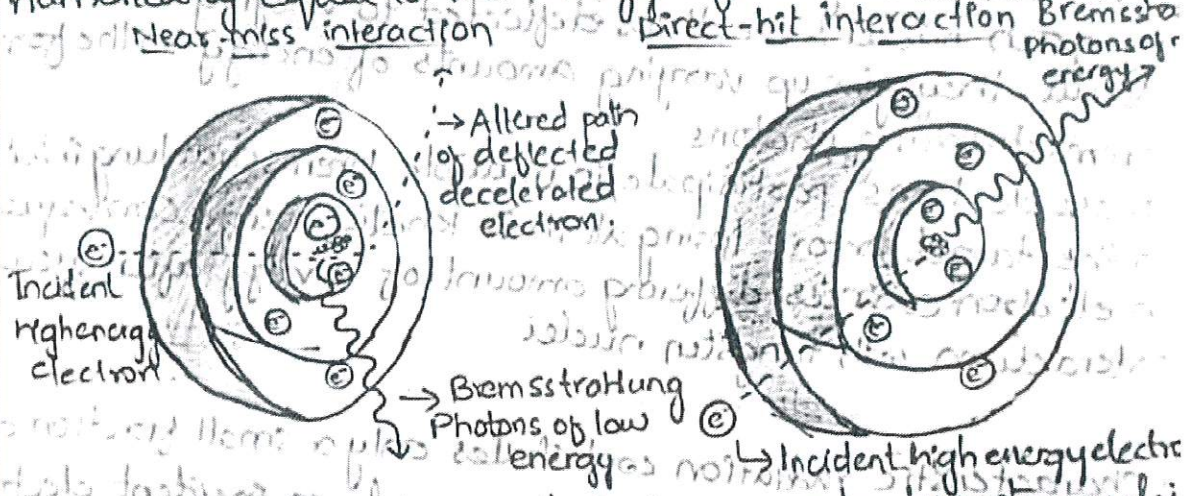
indicates that one could make 1-second exposure every 60 seconds.

PRODUCTION OF X-RAYS

- most high speed electrons travelling from filament to target interact with target electrons & release their energy as heat, occasionally, the electrons kinetic energy is converted into x-ray photons by formation of bremsstrahlung radiation & characteristic radiation.

Bremsstrahlung Radiation :-

- The sudden stopping or slowing of high speed electrons by tungsten nuclei in the target produces bremsstrahlung photons of radiation from an x-ray tube. occasionally, electrons from filament directly hit the nucleus of target atom. when this happens, all the kinetic energy of electron transformed into single x-ray photon. The energy of resultant photon is numerically equal to the energy of the electron.



- More frequently, high speed electrons pass by tungsten nuclei with near or wide misses. In these interactions, the electron is attracted towards positively charged nuclei, its path is altered towards the nucleus & loses some of its velocity. This deceleration causes the electron to lose kinetic energy that is given off in the form of many new photons.
- The closer the high speed electron approaches the nuclei, the greater electrostatic attraction b/w the nucleus & the electrons, the braking effect & energy of resulting bremsstrahlung photons.

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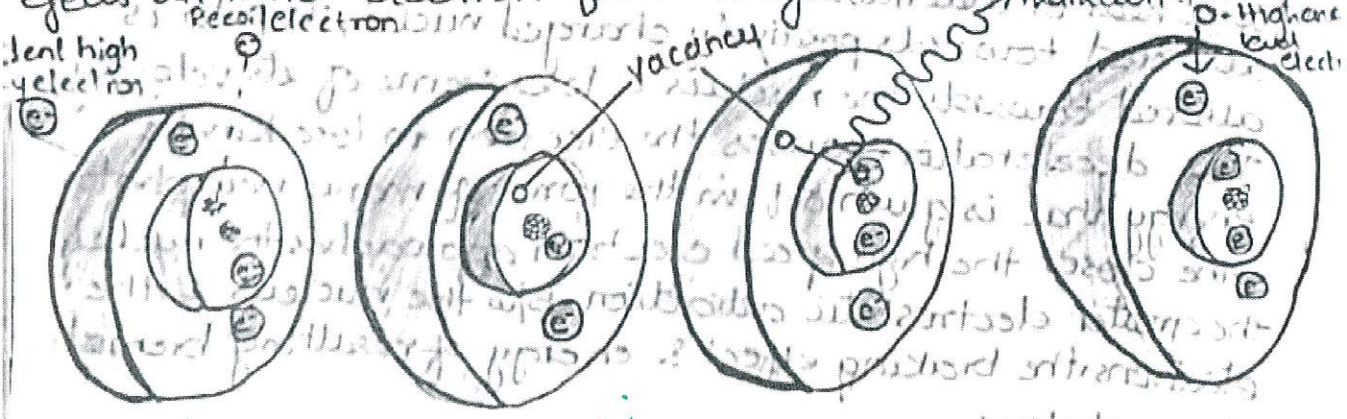
- The efficiency of this process is proportional to the square of at number of target. high Z metals are more effective in deflectin the path of incident electrons.
- Bremsstrahlung interactions generate x-ray photons with a continuous spectrum of energy. The energy of an x-ray beam is usually described by identifying the peak operating voltage(

Ex: A dental x-ray machine operating at peak voltage of 70 KVp applies a fluctuating voltage of upto 70 KVp across tube. This tube produces a continuous spectrum of x-ray photo with energies ranging to maximum of 70 KeV.

- Reasons for continuous spectrum are:
- The continuously varying voltage difference between target filament causes electrons striking the target to have varying levels of kinetic energy.
- The bombarding electrons pass at varying distances around tungsten nuclei & are thus deflected to varying extents. As a result, they give up varying amounts of energy in the form of bremsstrahlung photons.
- most electrons participate in multiple bremsstrahlung interacti in the target before losing all their kinetic energy. consequently an electron carries differing amount of energy after successiv interaction with tungsten nuclei

Characteristic Radiation :-

- characteristic radiation contributes only a small fraction of the photons in an x-ray beam. It is made an incident electron ejects an inner electron from tungsten atom.



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,en this happens an electron from an outer orbital is quickly
racted to the void in the deficient inner orbital
hen an outer orbital electron replaces the displaced electron, a
oton is emitted with energy equivalent to the difference in the binding
ergies of the two orbitals. The energies of characteristics photons are
:crete because they represent the difference of the energy levels of
ecific electron orbitals and are characteristics of target atoms.
e production of characteristic radiation has no practical impli
tion for dentomaxillofacial radiography.

ctors controlling the X-RAY Beam:

x-ray beam may be modified by altering the beam exposure
ration (timer), exposure rate (mA), energy (kVp and filtration),
ape (collimation) or intensity (target-patient distance).

xposure time (s) :-

hanging the exposure time- typically measured in fractions of c
cond- modifies the duration of the exposure & thus the number
photons generated. when the exposure time is doubled, the
o. of photons generated at all energies in the x-ray emission
ectrum is doubled.
he range of photon energies is unchanged. Practically, it is
esirable to keep the exposure time as short as possible to
inimize blurring from the patient motion.

illiamperage setting (mA; Tube current) :-

Like the effects of exposure time, the quantity of radiatio
produced by an x-ray tube (i.e, the number of photons that
reach the patient). is directly proportional to the milliampe
tting (mA setting).
As the mA setting is increased, more power is applied to t
filament which heats up & releases more electrons that
collide with target to produce radiation. Thus, as with
exposure time, doubling the mA setting & will double the r
of photons produced. The product of mA setting & exposure t
(mAxs, or mAs) is often used as a single parameter to den

the total no of photons produced. for instances a machine operating at 10mA for 1 second (10x1=10mAs) produces the same no of photons when operated at 20mA for 0.5 sec (20x0.5=10m The term beam quantity refers to number of photons in an x-r beam Linearity and reproducibility of mA and s settings are often included in quality assurance programme for x-ray units, including those used in dental and maxillofacial imaging

Tube voltage peak (kVp) :-

- Increasing the kvp increases the potential differences betwee cathode and anode increasing the kinetic energy of the electro as they move toward the target.
- The greater the energy of an electron, the greater the probability will be converted into x-ray photons of the target.
- Increasing the kvp of an x-ray machine increases:
  - The number of photons generated.
  - The mean energy of the photons
  - The maximal energy of the photons.
- The term beam quality refers to the mean energy of an x-ray b

Filtration :-

- Although an x-ray beam consists of a continuous spectrum x-ray photons energies, only photons with sufficient energy t Penetrate through anatomic structures & reach the image receptor (digital or film) are useful for diagnostic radiolog
- Low energy photons that cannot reach the receptor Contribute to patient risk but do not offer any benefit.
- consequently, it is desirable to remove these low energy. Photons from the beam.
- This removal can be accomplished in part by placing a metallic disk (filter) in the beam path.
- A filter preferentially removes low energy photons from th beam but allow high energy photons that contribute to making an image to pass through.

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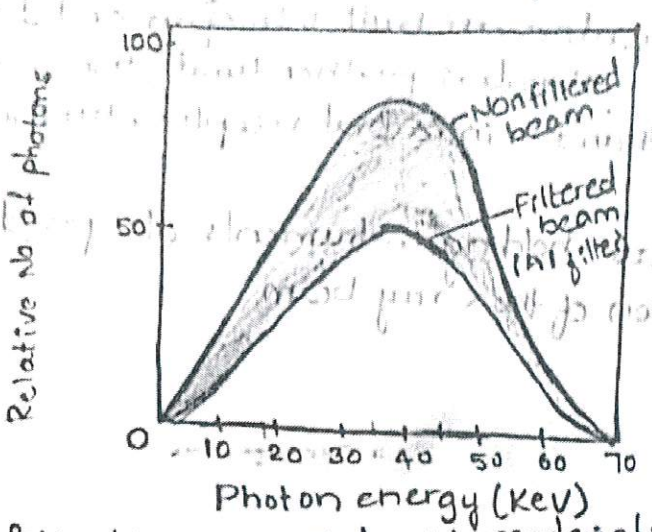
FILTRATION



herent filtration. consists of materials that x-ray photons counter as they travel from the focal spot on the target to m the usuable beam outside the tube enclosure. These materials lude the glass wall of x-ray tube. The insulating oil that surr unds many dental tubes and the barrier material that prevent oil from escaping through x-ray port. The inherent filtration most x-ray machines ranges from equivalent of 0.5 to 2mm of minium.

ded filtration may be supplied in the form of aluminium ks placed over the port in the head of x-ray machine.

al filtration is the sum of inherent and added filtration. eral regulations in the united states requires the total ration in the path of dental x-ray beam to be equal to equivalent 1.5 mm of aluminium for a machine operating up to 70 kvp and 2.5 mm of aluminium for machines operating higher voltages.

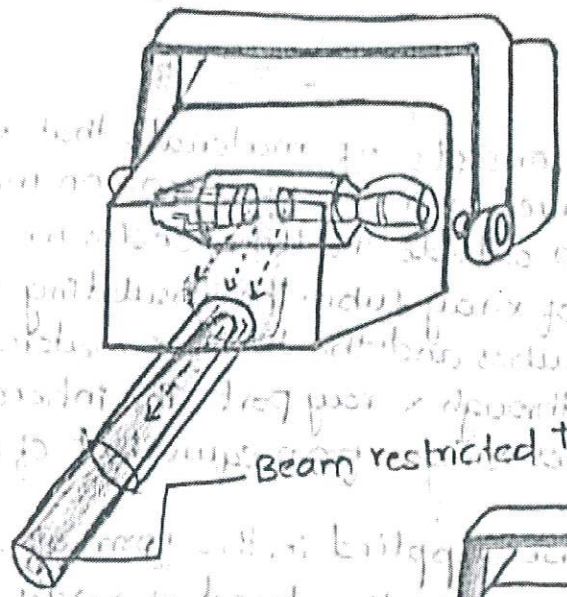
limation:-

collinator is a metallic barrier with an operator in the middl ed to shape & restrict the size of the x-ray beam and ume of tissue irradiated

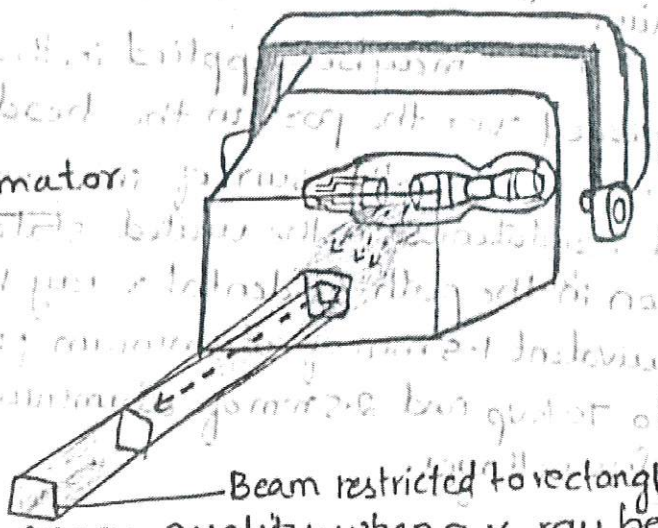
und and rectangular collimators are frequently used in intra l radiography. Dental x-ray beams are usually collimated a circle 2.75 inches (7cm) in diameter at the patients face.

→ A round collimator is a thick plate of metal with a circular opening centered over the pool in the x-ray beam energies.
→ Typically round collimators are built into open-ended aiming cylinders. Rectangular collimators further limit the size of the beam to just larger than the intra oral receptor, further reducing Patient exposure.
→ Some types of receptor-holding instruments also provide rectangular collimation of the x-ray beam.

Circular collimator



Rectangular collimator:



Collimators also improve image quality. when a x-ray beam is directed at a patient, the hard & soft tissues absorb approximat 90% of the photons & approximately 10% pass through the patie to reach the image receptor (film or digital receptor)
- many of the absorbed photons generate scattered radiati within the exposed tissues by a process called compton scatte

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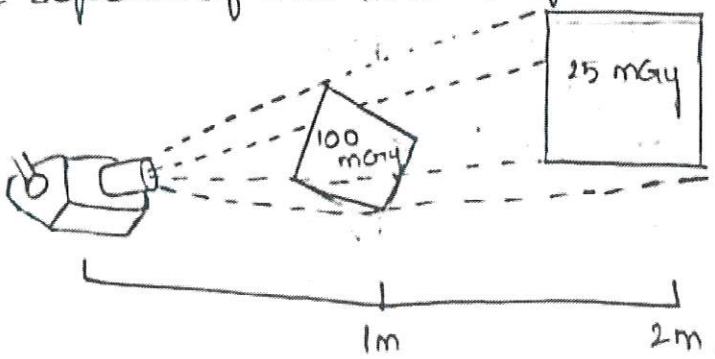
These scattered photons travel in all directions, and some reach the receptor & degrade image quality.
- collimating the x-ray beam thus reduces the exposed volume & thereby the no of scattered photons reaching the image receptor, resulting in reduced patient exposure & improved images.

Inverse square law:-

The intensity of an x-ray beam (the no. of photons per cross sectional area per unit of exposure time) varies with distance from the focal spot.
- For a given beam, the intensity is inversely proportional to the square of the distance from the source



The reason for this decrease in intensity is that an x-ray beam spreads out as it moves from its source. The relationship is as follows:-

$$\frac{I_1}{I_2} = \frac{(D_2)^2}{(D_1)^2}$$

→ where I is Intensity and D is distance. If a dose of 4 Gy is measured at 1 m, a dose of 1 Gy would be found at 2m and dose of 0.25 Gy would be found at 4m.

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Practical applications :-

- changing the distance between the x-ray tube & the Patient such as by switching from a machine with a short aiming tube to one with long aiming tube, has a marked effect on beam intensity. such a change requires a corresponding modification of kVp or mA to maintain the same intensity at the image receptor.
- Increasing operator distance from the x-ray source is an effective method to minimize operator dose.

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INTERACTIONS OF X-RAYS WITH MATTER

- In dental and maxillofacial imaging, x-ray beam enters face of patient interacts with hard & soft tissues & strikes digital sensor.
- The incident beam contains photons of many energies. The intensity of beam is essentially uniform from center of beam outward.
- As beam goes through patient, it is reduced in intensity (attenuated). This attenuation results from absorption of individual photons in the beam by atoms in tissues or by photons being scattered out of beam.
- In absorption interactions, photons interact with tissue atoms & cease to exist.
- In scattering interactions, photons interact with tissue atoms but then move off in another direction the frequency of these interaction depends on type of tissue exposed. Bone absorbs x-ray photons, soft tissues let them pass through.
- This differential exposure of film or digital sensor forms radiographic image.
- There are three means of beam attenuation in diagnostic x-ray beam:
  - Photoelectric absorption.
  - Compton scattering.
  - Coherent scattering.

Interactions of photons from a diagnostic x-ray beam

Interaction	Ionization	Scatter	Practical implication.
Photoelectric absorption	Yes	No	Basis of radiographic image formation.
compton scatter	Yes	Yes	Scatter radiation can degrade image expose personnel & pt
coherent scatter	No	No	minimal contribution to scatter.

PHOTOELECTRIC ABSORPTION :-

- It is critical in diagnostic imaging because it is basis of image radiographic formation. This process occurs when incident photon interacts with electron in inner orbital of an atom in patient.
- The incident photon loses its energy to electron & ceases to exist.

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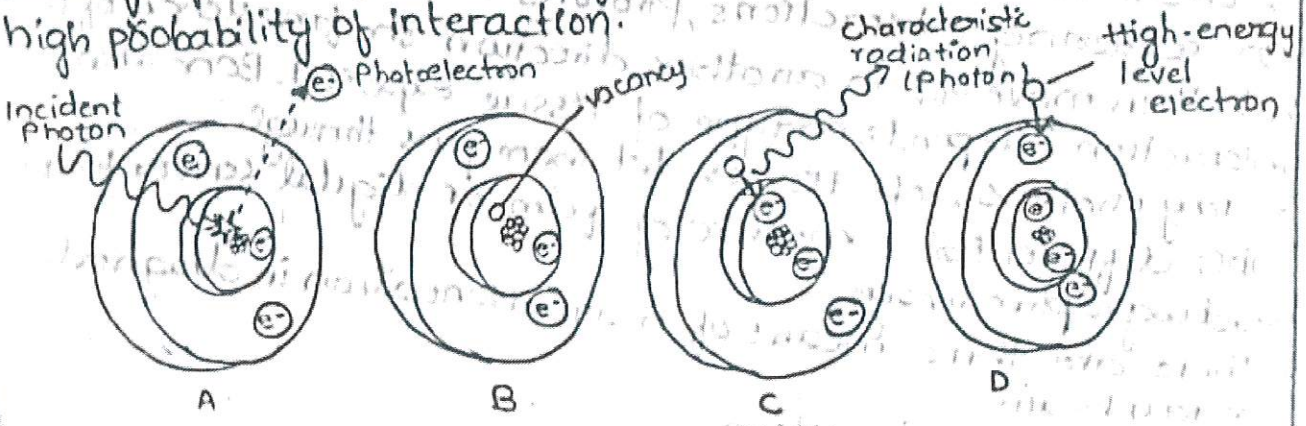
- The energy absorbed by electron is expended to overcome binding energy and remainder energy remains as kinetic energy of electron.
- The kinetic energy imparted to electron (termed coil electron or photoelectron) is equal to energy of incident photon minus binding energy of electrons.
- Photoelectrons ejected during photoelectric absorption travel only short distances in the absorber before they give up their energy through 2° ionisation.
- most photoelectric interactions occur in is orbital because density of electron cloud is greatest in this region & there is high probability of interaction.



PHOTOELECTRIC ABSORPTION.

- The photoelectric interaction causes ionization of atom because of loss of electron. this electron deficiency is instantly filled usually by 2s or 2p electron, with release of characteristic radiation
- The probability of photoelectric interaction is directly proportional to third power of atomic number (Z) of absorber & inversely proportional to third power of energy of incident Photon (E).

Probability of photoelectric interaction $\propto \frac{Z^3}{E^3}$.

COMPTON SCATTER:-

→ It occurs when photon interacts with an outer orbital electron

→ Approximately 51% of interactions in the dental x-ray beam exposure involve compton scatter.

→ In this, the incident photon collides with outer orbital electron, which receives kinetic energy & recoils from point of impact

→ The path of incident photon is deflected by interaction & scattered in new direction. The energy of this photon equals the energy of incident photon minus sum of kinetic energy gained by recoil electron & its binding energy.

→ when these scattered photons reach image receptor, they cause degradation of image

→ As with photoelectric absorption, compton scatter results in loss of electron & ionization of absorbing atom

- The probability of compton interaction is inversely proportional to photon energy & is independent of at no.
- The probability of compton scatter is dependent on electron density of absorber which is relatively constant in tissue

Practical implications of photoelectric effect :-

Differential absorption in various tissues & objects provides radiographic constrast. Because the effective atomic number of compton bone ($Z = 13.8$) is the greater than that of soft tissue ($Z = 7.4$), the probability of photoelectric interaction of x-ray photons in bone is approximately 6.5 times greater than in an equal thickness of soft tissue ($13.8^3 / 7.4^3 = 6.5$). This marked difference in the absorption of x-ray photons by soft & hard tissue makes production of radiographic image possible. This differential photo electric absorption of x-ray photons in enamel, dentin, pulp, bone & soft tissue is what we observe as different degree of radioopacity on radiographic image

- causes ionization & potential for biological damage.

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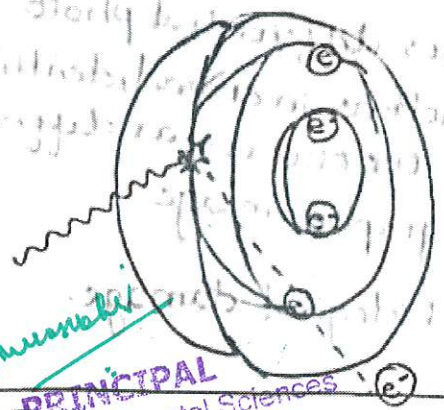
COHERENT SCATTER :-

- It is also known as Rayleigh, classical or elastic scatter
- It may occur when a low energy incident photon (<10 kev) interacts with a whole atom. The incident photon causes it to become momentarily excited. The incident photon then ceases to exist.
- The excited atom quickly returns to ground state & generates another x-ray photon with same energy as the incident photon.
- usually the secondary photon is emitted in different direction than the path of incident photon.
- The net effect is that the direction of the incident x-ray photon is altered (scattered)
- It accounts for only 7% of total no. of interactions in dental exposure. Because no energy is transferred to biologic atom & no ionization are caused, the biologic effects of coherent scatter are insignificant.
- Because coherent scatter occurs primarily in lower energy range, the scattered photon has insufficient energy to reach image receptor & thus coherent scatter has minimal impact on image degradation

Practical implications of compton scatter :-

- scattered photons travel in all directions & may exit the Patient & strike the image receptor. These photon carry no useful information & degrade image by reducing contrast.
- scattered photons that exit patient can expose the operator
- scattered photons travel varying distances within patient tissue & cause ionization. This internal scatter increases pt radiation dose often exposes organs & tissues outside of & distant from path of primary beam.



Compton scattering occurs when one incident photon interacts with outer electron, producing a scattered photons of lower energy that incident photon & recoil electron ejected from target atom the new scattered Photons travel in a different direction from the incident Photon

Uses of x-Ray Radiation :-

1. Radiology :- Diagnosis in dental & medical field.
2. Radiotherapy :- Treatment of neoplasm.
3. Industrial and art radiography :- Examination of gross structures (casting, welds, old paintings etc) x-rays are also used in detecting faults, cracks, flows & gas pockets in finished metal pockets.
4. Spectroscopy :- Identification of element & their atomic numbers, & structures.
5. Radiobiology :- Alteration of cells & tissues for experimental purpose.
6. Crystallography :- Analysis of molecular structure is done with help of x-rays.
7. Sterilization :- preservation of food.
8. Digital radiography :- x-rays can activate charge-coupled devices.
9. Xeroradiography :- Neutralize electric charges in selenium coated plates.
10. Detective department :- Used by detective agencies for detection of explosives, opium & other contraband goals.

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PROPERTIES OF X-RAYS:-

1. x-rays are a form of electromagnetic radiation
2. They have short wavelength & hence exhibit great penetrating power
3. They travel at a speed of light (3×10^8 m/s or 186000miles/sec)
4. They affect photographic plates & x-ray films
5. They travel in straight line in form of waves.
6. x-rays are made up of small packets of light called photons or quanta
7. They can ionize gases.
8. They cannot be focussed using lens.
9. They cannot be reflected, refracted, or deflected by magnetic field
10. They can penetrate opaque objects
11. They follow the inverse square law.
12. They are invisible to eye & cannot be heard or smell.
13. They exhibit properties of interference, diffraction & reflection similar to visible
14. They can produce electric field at right angle to path of propagation
15. They can produce magnetic field at right angle to electric field & path propagation
16. They do not require any medium for propagation.
17. x-rays can penetrate liquids, solids & gases. The degree of penetration depends on quality, intensity & wavelength of x-ray beam
18. They are absorbed by matter
19. They interact with materials they penetrate & cause ionization
20. They exhibit healing effect.
21. When x-rays falls upon certain materials, visible lights will be emitted called as flourescence

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