




## Evaluation of antibiotic mix in Non-instrumentation Endodontic Treatment of necrotic Primary molars

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**DR RICHA**

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## Introduction

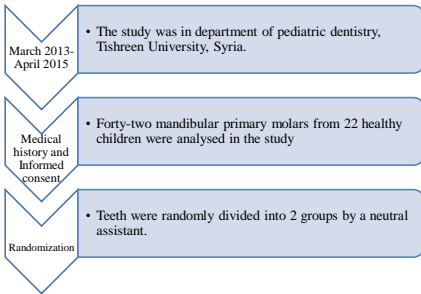
- Primary teeth are considered as natural space maintainers. It is important to preserve primary teeth in the dental arch until exfoliation to maintain the space and for proper guidance for eruption of permanent teeth.
- A primary teeth with a necrotic pulp can be treated by pulpectomy.
- However, pulpectomy has certain limitations. Pulpectomy cannot be performed on the teeth with resorbed roots, teeth with mobility, or teeth with clinical furcation involvement. Such teeth are preferable for extraction and placement of space maintainer. (Waterhouse et al, 2011).
- Thus, a new technique which is simple and less time consuming should be adopted to treat such teeth.

- A concept of **lesion sterilization and tissue repair (LSTR)** was developed by the Cariology Research unit of Niigata University, School of Dentistry in Japan.
- It is also known as Non-instrumentation Endodontic Treatment (NIET)
- This technique involves topical application of Triple Antibiotic Paste which consists of - Metronidazole, Minocycline and Ciprofloxacin mixed with carrier propylene glycol and polyethylene glycol (MP) . This mixture is called as 3Mix-MP.
- However one disadvantage with this mixture is presence of Minocyclin which leads to discolouration especially in calcifying teeth. (Kim et al, 2010)
- The Children's Hospital of Wisconsin, Milwaukee made changes in 3Mix paste, replacing the Minocycline with Clindamycin and adding Iodoform to the mixture to make it radiopaque. This mixture is called as 3Mix -MP-R. (Burrus et al, 2011)

## Aims and objectives

- The purpose of the study was to conduct a clinical and radiographic evaluation of the endodontic treatment of the mandibular primary molars with necrotic pulp by using two different mixtures of antibiotics: 3Mix-MP and 3Mix-MP-R. Also, to investigate the effect of root resorption on the success of the treatment.

## Materials and Methods



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## Inclusion Criteria

- Pain or tenderness to percussion
- Abscess
- Fistula opening
- Mobility
- External root resorption or excessive bone resorption on radiograph

## Exclusion Criteria

- Non- Restorable teeth
- Teeth with perforation in the pulpal floor

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The clinical signs and symptoms were recorded, radiographs were taken prior to the treatment by one operator. All the treatment was performed by one operator and was completed on same visit.

Each drug was pulverised into fine powder using motor and pestle after removing the capsule and enteric coating. The pulverised drugs were mixed together in a ratio of 1: 1: 1 in two mixtures for two distinct groups.

In both groups, the pulverised drugs were mixed with a vehicle (MP) which is a combination of propylene glycol [P] and polyethylene glycol (Macrogol, M) in a ratio of 1:7. Iodoform was added to both mixtures making them radiopaque and allowing radiographic control of proper paste placement

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LA was administered and tooth was isolated using rubber dam and entire carious tissue was removed.

Pulp chamber access was obtained and the remaining necrotic coronal pulp tissue was removed with a high-speed handpiece and a sterilised diamond round bur No.18.

The root canal orifices were enlarged (1 mm diameter, 2 mm depth) to form medication cavities by using sterilised diamond round bur No.12

One of the two drug pastes (3Mix-MP or 3Mix-MP-R) was randomly placed in the medication cavity and over the pulpal floor. The operator and the children were blinded to the paste used. Then, the tooth was sealed with glass ionomer cement GIC and restored with SSC

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- The patients were clinically checked after one and three months from the initial treatment to perform a clinical examination and to ensure the complete disappearance of clinical signs and symptoms. The cases were then followed-up clinically and radiographically at 6 and 12 months after the procedure.
- A blinded clinical evaluation was performed by the operator, whereas the radiographic evaluation was carried out independently by two experienced paediatric dentists (not the operator) blinded to the technique
- The inter-examiner reproducibility was calculated by Cohen's kappa statistic and was indicated excellent with a measurement agreement of 0.95.

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## Clinical success criteria

Absence of pathological clinical signs and symptoms of the oral disease (pain or tenderness to percussion; abscess, fistula, and/or abnormal mobility).

## Radiographic success criteria

The size of the periapical/bifurcation radiolucency reduced or remained the same compared to the preoperative status

- In case of normal exfoliation the case was considered success both clinically and radiographically.
- At the end of the follow-up period, the overall clinical and radiographic failure rates in the study were calculated. The cases were considered as total (overall) failures if they failed clinically at the 3, 6 or 12 months; or when they failed radiographically at the 12 months follow-up.
- Statistical tests used to analyse the findings were Chi Square test or Fisher's Exact test

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## Results

- Before the treatment, no statistically significant differences existed between the two groups in terms of the distribution of the preoperative clinical and radiographic signs and symptoms and the degree of root resorption.

	3Mix-Mp n= 21	3Mix-MP-R n= 21	p value
<b>Clinical signs and symptoms</b>	n (%)	n (%)	
Pain and tenderness to percussion	21 (100)	20 (95.24)	0.311
Abscess	11 (52.38)	12 (57.14)	0.757
Fistula	4 (19.05)	5 (23.81)	0.5
Mobility	7 (33.33)	8 (38.1)	0.7
<b>Radiographic signs</b>			
Periapical/Bifurcation radiolucency	21 (100)	21 (100)	-
Root resorption < 1/3	10 (47.62)	9 (42.84)	0.757
Root resorption > 1/3	11 (52.38)	9 (42.84)	0.757

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- After one month from treatment all the cases in both groups (100%) were completely free of clinical signs and symptoms.
- At the three-month follow-up, three teeth (14.28%) in the 3Mix-MP group exhibited clinical symptoms (one tooth [3.6%] had a fistula, and two teeth showed abscess [9.52%]), while one tooth (5%) in the 3MixMP-R group showed an abscess. These teeth were extracted.
- After 6 and 12 months from treatment all teeth (100%) in both groups were completely clinically asymptomatic.

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- No statistically significant differences were noticed between the two groups regarding the appearance of radiolucency and the radiographic success rates after 6, and 12 months of treatment

	3Mix-Mp n (%)	3Mix-MP-R n (%)	p value
<b>Follow-up period</b>	n (%)	n (%)	
<b>6 months</b>			0.61
Decrease in radiolucency	17 (94.44)	16 (80)	
Static radiolucency	1 (5.55)	2 (10)	
Increase in radiolucency	0	2 (10)	
Radiographic success rate			0.61
<b>12 months</b>			0.67
Decrease in radiolucency	11 (61.11)	11 (55)	
Static radiolucency	3 (16.67)	3 (15)	
Increase in radiolucency	1 (5.56)	4 (20)	
Normal exfoliation	3 (16.67)	2 (10)	
Radiographic success rate	17 (94.44)	16 (80)	0.205

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## Overall results

The overall failures in the 3Mix-MP group were 4 out of 21 teeth (19.04%) (3 teeth failed clinically during the follow-up period and one tooth failed radiographically at 12 months)

The overall failures in the 3Mix-MP-R group were 5 out of 21 teeth (23.80%) (one tooth failed clinically during the follow-up period and four teeth failed radiographically at 12 months)

The overall success rates for 3Mix-MP and 3Mix-MP-R were 80.96% and 76.20% respectively, with no statistically significant difference (p = 0.71).

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- Although resorption of more than one third of the root length had a lower failure rate radiographically there were no statistically significant differences were noticed regarding the association between root resorption degree and the clinical and radiographic success of the treatment within each group individually during all the follow-up periods.

	Radiographical success		Clinical Success		p value
	3mix-MP n (%)	3Mix-Mp-R n (%)	3mix-MP n (%)	3Mix-Mp-R n (%)	
<b>Follow up period</b>	n (%)	n (%)	n (%)	n (%)	
<b>6 months</b>					
root resorption<1/3	8 (100)	9 (100)	8 (100)	8 (88.88)	0.53
root resorption>1/3	10 (100)	11 (100)	10 (100)	10 (90.9)	0.52
<b>12 months</b>					
root resorption<1/3	8 (100)	9 (100)	7 (87.5)	6 (66.67)	0.33
root resorption>1/3	10 (100)	11 (100)	10 (100)	10 (90.9)	0.52

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## Discussion

- The main goal of the successful endodontic treatment is to eliminate all the bacteria in the root canal system.
- LSTR system employs a mixture of antibacterial drugs in a propylene glycol vehicle for disinfection of carious lesions. Since in this technique there is no mechanical instrumentation, too much enlargement of the root canals is prevented, chair side time is reduced and only one treatment visit is required.
- Antibacterial drugs that were selected was based on the studies to discover the target bacteria in endodontic treatment.
- Metronidazole has a wide bactericidal spectrum against anaerobes commonly found in infected oral tissues, so it was the first chosen antibiotic.
- However, metronidazole was unable to eradicate all the bacteria in the lesions, even at high concentrations; in fact, some bacteria were resistant to it [Hoshino et al., 1988; Hoshino et al., 1989].
- Thus, ciprofloxacin, a bactericidal agent effective against gram negative species and minocyclin, a bacteriostatic agent effective against a wide range of microorganisms were added to metronidazole
- Several in vivo and in vitro studies were conducted and showed that mixed drugs (3Mix-MP) were effective against oral bacteria including those present in carious lesions, infected dentin, and necrotic pulp in primary teeth (Sato et al., 1992; Takushige et al., 2004)

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- The cause of early clinical failure after 3 months from treatment for the 4 cases can probably be attributed to the insufficient marginal sealing of the stainless steel crowns due to the deep extent of subgingival caries which could result in the leakage of the medical substance.
- **Pinky et al. [2011] and Nanda et al. [2014]** compared the efficacy of the 3MixMP with another mixture in which metronidazole was substituted by ornidazole. In both studies, no statistically significant differences were observed between the two groups, with increased radiographic success rates for the new mixture. However the results of the study by **Pinky et al** in 3Mix-MP showed clinical and radiographic success rates 100% and 90%, respectively. This discrepancy may be a result of the differences in the sample selection criteria or in the clinical procedure followed.
- Although all the previous studies reported acceptable clinical and radiographic success rates for the LSTR treatment using the 3Mix-MP, **Trairivorakol and Detsomboonrat [2012]** suggested that LSTR treatment with the 3MixMP in primary teeth cannot substitute the conventional endodontic treatment as a long term treatment.

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- Clindamycin is effective for infections (eg, abscesses) caused by gram-positive aerobic bacteria and gram-positive or gram-negative anaerobic bacteria. These characteristics make clindamycin an appropriate alternative that is equivalent to the main mixture. Clindamycin is also used in antibiotic prophylaxis regimens for patients at high risk of infections who are in need for a dental procedure **[AAPD, 2015-2016d]**.
- **Burrus et al. (2014)** reported 3 clinical cases using mixture 3Mix-MP-R that revealed complete success.
- In both the groups antibiotic drugs were mixed with a carrier propylene glycol as the study by **Cruz et al. 2002** demonstrated the efficacy of propylene glycol in carrying 3Mix and penetrate through the dentinal tubules. Similarly, a study by **Phides and Hoshino [2008]** suggested MP as a good vehicle to carry medications through root canal obturation.
- The NIET treatment can be considered successful and effective especially in cases with poor prognosis because of its high antibacterial efficacy and is more likely to be acceptable for non-cooperating children

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## Conclusion

The study concludes that primary teeth with necrotic pulp can be treated with an antibiotic mixture composed of ciprofloxacin, metronidazole and minocycline or an antibiotic mixture composed of ciprofloxacin, metronidazole and clindamycin. Both combinations of antibacterial drugs can be used in endodontic treatment of primary teeth irrespective of the degree of root resorption.

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## Pros

- The entire procedure is explained in detail
- Study was blinded hence the chances of bias were minimised

## Cons

- No data of any photographs or radiographs
- No data regarding radiographic techniques used and method of measurement of radiolucency.
- Sample size was less
- Follow up period was less

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## References

- Parasuraman VR, Muljibhai BS. 3Mix- MP in Endodontics – An overview. IOSR Journal of Dental and Medical Sciences, 2012; 3 (1): 36-45
- Ali, M., Moral, A., & Quader, S. (2018). Evaluation of Pain and Tenderness in Endodontic Treatment of Deciduous Teeth using (LSTR) 3-Mix MP therapy. *Update Dental College Journal*, 7(2), 9-14.
- Rafatjou R, Afzal Soltani S. Successful treatment of necrosed primary molars using LSTR technique by a new combination of antibiotics: a case series. *Avicenna J Dent Res*. 2018;10(4):143-147
- Trairatvorakul C, Detsomboonrat P. Success rates of a mixture of ciprofloxacin, metronidazole, and minocycline antibiotics used in the non-instrumentation endodontic treatment of mandibular primary molars with carious pulpal involvement. *Int J Paediatr Dent* 2012; 22:217–227.

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- Pinky C, Shashibhushan KK, Subbareddy VV. Endodontic treatment of necrosed primary teeth using two different combinations of antibacterial drugs: An in vivo study. *J Indian Soc Pedod Prev Dent* 2011; 29:121-127
- Nanda R, Koul M, Srivastava S, Upadhyay V, Dwivedi R. Clinical evaluation of 3 Mix and Other Mix in non-instrumental endodontic treatment of necrosed primary teeth, *J Oral Biol Craniofac Res* 2014; 4:114-119.
- Sultana, S., Afroz, S., Karim, F., Saki, N., Sheikh, M. A., Mohammad wahiduzzaman, -, & Moral, A. (2019). LSTR 3 Mix MP Therapy and Conventional Root Canal Therapy: A comparative Clinical & Radiological Study for The treatment outcome of Irreversible Pulpitis In Permanent Tooth. *Update Dental College Journal*, 9(2), 20-26.

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**EVALUATION OF ANXIETY AND POST-OPERATIONAL DISCOMFORT IN FRENECTOMY PAEDIATRIC PATIENTS BY COMPARING CONVENTIONAL METHOD AND LASER APPLICATION - A CASE REPORT**

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**Introduction**



**TONGUE TIED**

- Ankyloglossia originates from the Greek words “agkilos” (curved) and “glossa” (tongue).
- Ankyloglossia is defined as a developmental anomaly of the tongue characterized by an abnormally short, thick lingual frenum resulting in limitation of tongue movement. It is also called tongue tie.
- Ankyloglossia can be of two types-
  - Partial Ankyloglossia
  - Complete ankyloglossia
- The prevalence is 0.1- 10.7 percent of the population. It is more common in males, with male to female ratio of 2.5 : 1.

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**Clinical Features:**

- Higher prevalence of nipple pain in mother feeding infants with ankyloglossia
- Infant feeding problems may lead to lower weight gain in such children
- Speech difficulties
- Reduced tongue mobility, difficulty in keeping the teeth clean
- Ankyloglossia has been associated with gingival recession due to intense pulling
- The lower tongue position can predispose maxillary hypodevelopment and mandibular prognathism leading to class III malocclusion

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**Clinical Guidelines for Management of Ankyloglossia**

- There is a wide difference of opinion regarding its clinical significance and optimal management.
- In many children, ankyloglossia is asymptomatic, and the condition may resolve spontaneously, or affected children may learn to compensate adequately for their decreased lingual mobility.
- Some children, however, benefit from surgical intervention of their tongue tie.

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- ❑ Surgical therapy for management of tongue-ties include frenotomy or frenectomy
- ❑ Frenotomy is the relocation of the frenal attachment, while frenectomy is the complete removal of the frenum and frenal attachment to the underlying bone
- ❑ Frenectomy can be accomplished either by –
  - Routine scalpel technique
  - Electrosurgery
  - Lasers

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### Conventional Technique

- ❑ Conventional frenectomy requires the use of scalpel and sutures, both of which are the source of fear and anxiety in pediatric patients..

#### Advantages:

- Ease of use,
- Low cost,
- Precise incision with well defined margins, no unwanted lateral tissue damage

#### Disadvantages:

- Need of anesthesia
- Excessive bleeding,
- Inadequate visibility caused by blood in the operative field,
- Need of suturing
- Need of post operative medication

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### Electro-cautery

- ❑ This procedure involves the use of electro-cautery unit with loop electrodes and haemostat and mainly recommended in cases of bleeding disorders.



#### Advantages

- The electrode cuts on its sides as well as on its tip
- Angulated electrode meets the clinical need
- Hemostasis is immediate and consistent

#### Disadvantages

- Flesh odor,
- Low tactile sense
- Bone can be damaged
- Dangerous in explosive environment
- Contraindicated in pacemakers.

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### Lasers



- ❑ The laser is a relatively modern technology which was developed in 1960 by Maiman.
- ❑ Though, it was first successfully used in the oral cavity in 1977 with consequent improvements and innovations over time

#### Advantages

- Low or no heat production
- Less discomfort, minimal or no bleeding
- Improved healing

#### Disadvantages

- Eye damage
- Cutting is slower than that with electro-cautery
- Expensive

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### Aims and Objectives

The purpose of this report was to compare management of ankyloglossia and assess the patient and dentists experience of performing the surgery using diode laser vs conventional approach.



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### Case Report

Two patients with **class III** ankyloglossia (Kotlow 1999) and with **definitely positive behaviour** pattern based on Frankl behaviour rating scale were selected from the routine OPD of Department of Paediatric and Preventive Dentistry, Maharaja Ganga Singh Dental College.

#### Kotlow classification

Clinically Normal	>16 mm
Class I: Mild Ankyloglossia	12-16 mm
Class II: Moderate Ankyloglossia	8-11 mm
Class III: Severe Ankyloglossia	3-7 mm
Class IV: Complete Ankyloglossia	<3 mm

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- ❑ The surgery was planned with two different treatment modalities i.e. conventional approach and diode laser. Post operative findings were recorded after one week of surgery
- ❑ Patients were assessed for level of fear and anxiety by **modifying dental anxiety scale (MDAS)**. Both surgeries were performed by the same operator, and the level of fear, pain, and discomfort were assessed during and after treatment.

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## Case 1

{ 14 }

- ❑ A 5 year old male child reported with chief complaint of difficulty in speech and restricted tongue movement.
- ❑ Clinically, the patient presented a thick and short lingual frenulum with anterior insertion



Pre-operative photograph

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Patient was scheduled for surgery with conventional approach

Bilateral lingual nerve block with local infiltration in the anterior area was administered with 2% lidocaine and 1:100,000 epinephrine.

A 3-0 silk suture on the tip of the tongue was used for traction.

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The first incision was made with a 15c blade cutting through the upper aspect of the frenum



The second incision was made at the lower aspect of the frenum, fairly close to the floor



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- ❑ The frenum was then excised, leaving a diamond-shaped wound. The wound margins were undermined with the tips of blunt-ended dissecting scissors.

- ❑ Tension free closure was done by non absorbable suture.



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- ❑ Patient was slightly anxious when he was on the dental chair and showed mild anxiousness during administration of local anaesthesia.
- ❑ During surgery patient was severely anxious and showed uncooperative nature.
- ❑ Patient was in discomfort after procedure and he did not allowed to remove the suture after 7 days as he was under psychological trauma.

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## Case 2

{ 20 }

- ❑ A 5 year old male patient reported with the chief complaint of restricted movement of tongue



Pre-operative photograph

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Patient was scheduled for treatment of ankyloglossia with diode laser.

Prior to surgery, following aseptic protocol local anaesthesia was infiltrated

Frenum was excised using diode laser (Biolase) and patient was recalled after 7 days

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During laser treatment



Post operative after a week.

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- ❑ Patient was slightly anxious during treatment.
- ❑ Post treatment pain and level of discomfort were less as compare to surgical excision of ankyloglossia.

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## Discussion

- ❑ Patients who undergo conventional frenectomy procedures using a scalpel often experience postsurgical pain and discomfort
- ❑ One feasible alternative that can be considered is a laser, as it offers various advantages, that is, relatively bloodless surgery, sterilization of wound, less surgical time, periodontal dressing not required, less postsurgical pain and discomfort and increased patient acceptance

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Butchibabu K. et al evaluated the effects of diode laser and scalpel technique on degree of post-operative pain and discomfort experienced by patients on the 1st, 3rd and the 7th post-operative days after frenectomy and supported the use of diode lasers in soft tissue procedures like frenectomy as they provide better patient perception in terms of reduced operative time, pain, and discomfort than that obtained by the scalpel technique.

Kaur P et al compared the degree of postoperative pain, discomfort and functional complications (eating and speech), experienced by patients after two frenectomy operation techniques and results indicated that patients treated with the diode laser had less postoperative pain and fewer functional complications as well as required fewer analgesics compared to patients treated with the conventional scalpel technique.

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Thus, laser technology can be considered as an alternative to the conventional techniques presenting several advantages such as :-

- Shorter operative time
- Less local anesthetic requirement
- Less postoperative complications
- Enhances access and visualization
- The need for suture is eliminated
- Uniform depth in the surgical site is maintained

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## Conclusion

The application of laser resulted in less stress and fear in patients during procedure, also leading to more conservative non-invasive method with minimal discomfort and bleeding, therefore making it a boon for the paediatric dentistry



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## Pros

- Photographs of each step is given
- Detailed description of conventional technique

## Cons

- No detailed description of the laser technique
- Only patient evaluation is done according to patient assessment
- No data of readings of anxiety scale given

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## References

- Chiniforush N, Ghadimi S, Yarahmadi N, Kamali A. Treatment of Ankyloglossia with CO<sub>2</sub> Laser in a Pediatric Patient. J Lasers Med Sci 2013; 4(1):53-5
- Gujrathi A, Ambulgekar V, Handal A. Surgical techniques for the treatment of tongue tie in children: a comparative study. Int J Otorhinolaryngol Head Neck Surg 2016; 2:128-34.
- Chiniforush N, Ghadimi S, Yarahmadi N, Kamali A. Treatment of Ankyloglossia with CO<sub>2</sub> Laser in a Pediatric Patient. J Lasers Med Sci 2013; 4(1):53-5
- Komori S, Matsumoto K, Matsuo K, Suzuki H, Komori T. Clinical Study of Laser Treatment for Frenectomy of Pediatric Patients. Int J Clin Pediatr Dent 2017; 10(3):272-277.

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## Periodontium in children: Gingival and Periodontal diseases.

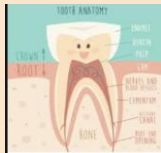
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- Classification of gingiva and periodontal diseases
- Gingival diseases in children
- Anatomical periodontal problems
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## INTRODUCTION

- The gingiva of the deciduous dentition is pale pink and firm.
- The interdental gingiva is broad faciolingually and tends to be relative narrow mesiodistally.
- The mean gingival sulcus depth for the primary dentition is  $2.1\text{mm} \pm 0.2\text{mm}$ .
- The width of the attached gingiva is greater in the incisor area, decreases over the cuspids, and increases again over premolars(primary molars) and permanent molars.



- The periodontal ligament of the deciduous teeth is wider than that of the permanent dentition.
- The periodontium serves as the supporting apparatus for the teeth and in occlusal relationships.
- Consists of the alveolar mucosa, gingiva, cementum, periodontal ligament and alveolar bone.

## NORMAL PERIODONTIUM IN CHILDREN

Healthy periodontium plays an important role in maintaining oral health of a child.

The normal periodontium of a child includes:

- Gingiva
- Periodontal ligament
- Cementum
- Alveolar bone



## COMPONENTS OF PERIODONTIUM

### GINGIVA

Gingiva is a part of oral mucosa, which covers the alveolar process and cervical portion of teeth.

- The gingiva consists of

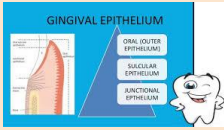


- Marginal gingiva: it is the margin surrounding the tooth in a collar like fashion.
- Gingival sulcus: space surrounding the tooth and it is bounded by tooth on one side and epithelium lining the free end of marginal gingiva on other side.
- Gingival texture: smooth in youth, stippled in adulthood.

$2.1\text{mm} \pm 0.2\text{mm}$  in Primary teeth



## Microscopic anatomy of gingival epithelium



- Oral epithelium
  - Sulcular epithelium
  - Junctional epithelium
- DENTOGINGIVAL JUNCTION**
- The dentogingival junction (gingiva facing the tooth) is an adaptation of the oral mucosa that comprises epithelial and connective tissue components.
  - Epithelium- is divided into three functional compartments
  - Gingival, sulcular and junctional epithelium
  - Connective tissue- into superficial and deep components.



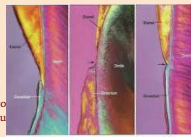
## CEMENTUM

- Is the calcified, avascular mesenchymal tissue, coating the outer covering of the anatomic root.
- In children, it is often thinner and less dense than that of adults.
- There are basically two varieties of cementum, on the basis of
  - The presence or absence of cells within it
  - The origin of the collagen fibres of the matrix.

- The development of cementum has been subdivided into

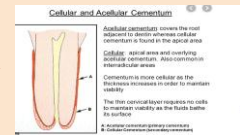
**PREFUNCTIONAL STAGE**, which occurs through out root formation.  
**FUNCTIONAL STAGE**, which when the tooth is in occlusion and continuous through out life.

- **CEMENTOENAMEL JUNCTION**- the anatomic limit between crown and root surface. In permanent teeth the CEJ is placed at the bottom of the gingival sulcus. In deciduous teeth the CEJ is more apical.
- Cementum of erupted as well as unerupted teeth is subject to resorptive changes.
- Cementum resists resorption in younger tissue, thus orthodontic tooth movement results in alveolar bone resorption rather than tooth root loss.



CEMENTUM is classified according to the presence or absence of cells within its matrix.

- CELLULAR MATRIX**, which has an adaptive role in response to tooth wear and movement and is associated with repair of periodontal disease.
- ACELLULAR CEMENTUM**, which provides attachment for the tooth.



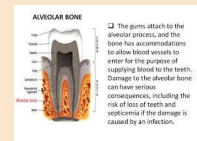
## Alveolar bone

Bundle bone consists of: Successive layers of intrinsic fiber bundles running parallel to the socket. Embedded within this bundle bone, almost perpendicular to its surface, are the extremities (Sharpey's fibres) of the periodontal ligament.

- Is that bone of the jaws containing the sockets (alveoli) for the teeth.
- Consists of outer cortical plates (buccal, lingual and palatal) of compact bone, a central spongiosa, and bone lining the alveolus (alveolar bone).
- The bone lining the socket is referred to as Bundle bone.

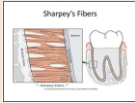
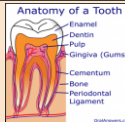
In children:

- Immature, more elastic and more pliable.
- Fewer trabecular and large marrow spaces.
- Smaller amount of calcification.
- Greater blood and lymph supply.
- The lamina dura is thinner.
- The alveolar crest appears flatter.



## PERIODONTAL LIGAMENT

- Soft, specialized connective tissue.
  - Situated between the cementum of the tooth and the bone forming the socket wall.
  - Ranges in width from 0.15 to 0.38mm, thinnest portion around the middle third of the root.
  - It has the capacity to act as a sensory receptor necessary for the proper positioning of the jaws during mastication.
- It is a cell reservoir of tissue homeostasis and repair or regeneration.



## The principal fibres of the periodontal ligament are arranged in six groups that develop sequentially in the developing root.

**Transseptal group**  
fibres extend interproximally over the alveolar bone crest. Embedded in the cementum of the adjacent teeth, and do not have osseous attachment.

**Horizontal group**  
Extend at right angles to the long axis of the tooth from the cementum to the alveolar bone.

**Apical group**  
Radiate in a rather irregular fashion from the cementum to the bone at the apical region of the socket. They donot occur on incompletely formed roots.

**Alveolar crest fibres**  
Extend obliquely from the cementum just beneath the junctional epithelium to the alveolar crest, and prevent the extrusion of the tooth and resists lateral tooth movements.

**Oblique group**  
Largest group, extend from the cementum in a coronal direction obliquely to the bone. They beat the brunt of vertical masticatory stresses and transform them into tension.

**Inter-radicular fibres**  
Fan out from the cementum to the tooth in the furcation areas of multirooted tooth.

**Principal Fiber Groups**

- Inter-radicular Group
- Oblique Group
- Horizontal Group
- Alveolar Crest Group

- **Before eruption** : alveolar bone crest is above cemento-enamel junction thus fibres are laid down obliquely in a coronal direction giving rise to oblique fibres.
- **As eruption begin**: alveolar crest coincides with the cemento-enamel junction and fibres are aligned horizontally.
- **When the tooth eruption is completed** and it is in full function, alveolar crest below cemento-enamel junction near apex thus fibres are again aligned obliquely but in an opposite direction to first laid fibre bundles, thus forming alveolar crest fibres.

## Differentiating features of children and adult periodontium

CHARACTERISTICS	CHILDREN	ADULT
Color	Red	Pale pink
Surface	Smooth	Stippled
Marginal gingiva	Thick and round	Knife edged
Interdental papilla	Keratinized saddle area, interdental clefts present	Non-keratinized interdental col, interdental cleft absent.
Attached gingiva	Retrocuspid papilla	Absent
Sulcus depth	2.1-2.3mm	0-3mm
Fibres	Gingival fibres are immature	Mature and organised
Trabeculae	Thin trabeculae	More trabeculae
	Large marrow spaces	Small marrow spaces
Alveolar bone	Lamina dura- thinner, fewer trabeculae, large marrow space	Lamina dura- thick, more trabeculae, decreased marrow space
	Decreased calcification	Increased calcification

## AAPD CLASSIFICATION OF GINGIVA AND PERIODONTAL DISEASES

### Gingival diseases

- Simple gingivitis
- Chronic inflammatory gingival enlargement
- Gingival abscess
- ANUG

### Adult onset periodontitis

### Early onset periodontitis

- Localized prepubertal periodontitis (LPP)
- Generalized prepubertal periodontitis (GPP)
- localised juvenile periodontitis
- Generalized juvenile periodontitis

### Systemic disease with associated periodontal disease

- Hypophosphatasia
- Leukocyte adhesion defect (LAD)
- Papillon- leferve syndrome
- Downs syndrome
- Chediak-higashi syndrome
- Neutropenia
- Langerhans cell histiocytosis
- Acute leukemia
- Insulin dependent DM (type 1)

Drug induced gingival over growth.

1. Mucogingival defects
2. Localized gingival recession
3. High labial frenum attachments

## PHYSIOLOGIC CHANGES IN GINGIVA ASSOCIATED WITH TOOTH ERUPTION

### Pre-erption bulge

Before crown appears, gingiva presents firm bulge, slightly blanched and conforms to contour of underlying crown.



### Normal prominence of gingival margin

In course of eruption, gingival margin is edematous, rounded, and slightly reddened.

## Oral microflora in children

- The comparison of the flora in the oral cavity changes as the host grows and matures.
- This may reflect the changing host characteristics, such as diet, maturity of the immune system, puberty, eruption of the deciduous and permanent dentition.



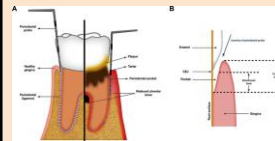
- Plaque-defined as the soft deposits that form the biofilm adhering to the tooth surface or other hard surfaces in the oral cavity, including removable and fixed restorations.
- Material alba-soft accumulation of bacteria and tissue cells that lack the organized structure of dental plaque and are easily displaced with a water spray.
- Calculus-hard deposit that form by mineralization of dental plaque and is generally covered by a layer of unmineralized plaque.



## Periodontal examination of children



- The periodontium is examined with a calibrated periodontal probe, a cowhorn or pigtail explorer or a probe, mouth mirror, and an adequate light.
- The examination includes observation of:
  - gingival color,
  - contour and consistency,
  - presence of crevicular hemorrhage or purulent exudate,
  - gingival margins relationship to the cemento-enamel junction,
  - width of the attached gingiva, crevice depth, and furcation areas.



- To measure the width of the attached gingiva, first measure the distances from the gingival margin to the mucogingival junction.
- Then probe the crevice or pocket depth. The distance from the margin to the mucogingival junction minus the crevice/pocket depth equals the width of attached gingiva.
- Gingival crevice depth is examined by inserting the periodontal probe parallel to and in contact with the gingival third of the tooth surface.
- The probe is inserted until gentle resistance is met.

•Deciduous teeth have more convex surfaces, and the portion of the tooth within the gingival crevice is at greater angle to the long axis of the tooth than with permanent teeth.

•The probe is stepped or moved in small increments around the entire circumference of each tooth.

•Save for the angulations necessary to accommodate the curvature of the tooth surface, the probe is kept parallel to the long axis of the tooth.

•Six representative measurements are recorded for each tooth, three facial and three lingual.

## Gingivitis

- Simple gingivitis is characterized by inflammation of the gingival tissues with no loss of attachment or bone.
- It occurs in response to the bacteria that live in biofilms at the gingival margin and in the sulcus.
- The clinical signs of gingivitis are include erythema, bleeding on probing, and edema.
- Certain local factors may be important contributors to gingivitis in children- crowded teeth and orthodontic appliances may make oral hygiene more difficult and predispose to gingivitis.

- Mouth breathing may cause chronically dehydrated gingiva in maxillary labial area and lead to a characteristic localized gingivitis.
- Inflammation, especially erythema, often occurs around erupting primary and permanent teeth.
- Gingivitis is reversible and can be managed with improved oral hygiene. Appropriately sized toothbrushes, toothpaste, and floss flavoured to appeal to children may enhance compliance.

**LOCAL RISK FACTORS**

Plaque, calculus, subgingival overhanging restoration, anatomical factors, root grooves, malocclusion, orthodontic appliances, abnormal oral habits, incompetent lips, eruption of teeth, xerostomia.

**Systemic risk factors**

Hormones, hematological disturbances (hemophilia, leukemia), malnutrition, metabolic disorders- DM, hereditary and genetic factors- orofacial clefts, neuromuscular disorders- cerebral palsy, viral, bacteria, fungal infection.

Pathologic changes in gingivitis are associated with the presence of oral microorganism in the gingival sulcus.

These organisms are capable of synthesising products ( collagenase, hyaluronidase, protease, chondritis sulfate or endotoxin).

## STAGES OF GINGIVITIS

Stages	Days	Vascular changes	Predominant immune cells	Clinical findings
stage I	2-4	inc permeability of vascular bed.	PMNs	inc gingival flow
Stage II	4-7	Vascular proliferation	Lymphocytes	Erythema, bleeding on probing.
Stage III	14-21	Stage II + blood stasis	Plasma cells and B lymphocyte	Change in color, size, texture
Stage IV	>month	Degeneration	Plasma cell	Loss of connective tissue attachment and alveolar bone.

## Types of gingivitis in children

- Plaque- induced gingivitis
- Gingivitis due to habit
- Eruption gingivitis
- Infective gingivitis
- Herpetic gingivostomatitis
- HIV- assoc gingivitis
- Acute necrotizing ulcerative gingivitis.
- Malnutrition-introduced gingivitis
- Pubertal gingivitis
- Drug-induced gingivitis
- Plasma cell gingivitis



## PLAQUE INDUCED GINGIVITIS

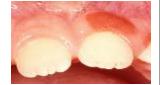
- The primary cause of gingivitis is plaque
- Local contributing factors
  - Poor oral hygiene
  - Calculus
  - Crowding
  - Orthodontic appliances
  - Eruption of teeth



## Plasma induced gingivitis



- Plasma cell gingivitis is characterized by diffuse and massive infiltration of plasma cells into the subepithelial gingival tissue (Macleod and Ellis, 1989).
- Plasma cell gingivitis which is also called atypical gingivitis or plasma cell gingivostomatitis.
- It presents clinically as a diffuse, erythematous, and papillary lesion of the gingiva, which frequently bleeds, with minimal trauma.
- It usually affects the maxillary gingiva, although reports have shown it affects mandibular gingiva also.



## GINGIVITIS DUE TO HABIT

Gingivitis very common finding in maxillary anterior region in individuals with mouth breathing habit.

This habit is common among young children and it predisposes to dryness of the gingiva when the lubricating effect of saliva is absent.

## ERUPTION GINGIVITIS



- This is gingival inflammation occurring around an erupting permanent tooth.
- During the eruptive phase, the epithelium displays degenerative changes at the site of fusion between dental and oral epithelium.
- These areas are vulnerable to plaque accumulation and sets up a bacterial reaction and since the child may be experiencing discomfort which will therefore make tooth brushing difficult.
- This will lead to plaque accumulation and inflammation.

## HERPETIC GINGIVOSTOMATITIS



- It affects both the gingiva and other parts of the oral mucosa membranes.
- Commonly seen in children less than 6 yrs of age.
- Caused by herpes simplex virus type 1.
- Diffuse erythematous, shiny involvement of the gingiva and the adjacent oral mucosa, with varying degrees of edema and gingival bleeding.
- In its initial stage, it is characterized by the presence of discrete, spherical gray vesicles, which may occur on the gingiva, labial and buccal mucosa, the soft palate, the pharynx, the sublingual mucosa and the tongue.
- Infection usually follows bouts of children fevers, such as malaria, measles and chickenpox.

## HIV-associated gingivitis

- Oral manifestation of human immunodeficiency virus disease are important part of natural history of HIV disease.
- Studies have reported that hairy leukoplakia, pseudomembranous candidiasis, Kaposi sarcoma, non-Hodgkin lymphoma, linear gingival erythema, necrotizing ulcerative gingivitis and periodontitis were common lesions seen in patient with HIV infection and AIDS.

## ACUTE NECROTIZING ULCERATIVE GINGIVITIS



- ANUG used to be known as "french mouth" because it was seen frequently in soldiers occupying trenches during the world war 1 and was also called "vincent's angina" after French physician henri Vincent.(1862-1950)
- It is an acute multiple bacteria infections of gingiva.
- Bacteria implicated were fusobacteria fusiform and borrelia vincentii.
- Punched out appearance due to ulcerated necrotic papilla and gingival margins.
- Ulcers are covered by a yellowish-white or grayish slough
- Lesion start at interdental papilla, spreading along the gingival margins and if untreated, starts to destroy the underlying connective tissue and bone.
- There is characteristic necrotic odour asso with this condition and the mouth becomes progressively painful with sloughing off the necrotic ulcers on gingivae.

- The ulcers become erythematous and bleed following minimal trauma, esp. tooth brushing.
- Regional lymph nodes are enlarged and tender.
- If untreated, destruction of soft tissues of the mouth and cheek and facial bones result, a condition referred to as Cancrum oris/Noma.
- It occurs with low frequency (<1%) in children in developed countries.
- Predisposing factors include poor oral hygiene, malnutrition and long term hospitalization.

## Horning and cohen extended the staging of these oral necrotising diseases as follows:

- Stage 1: necrosis of the tip of the interdental papilla
- Stage 2: necrosis of the entire papilla
- Stage 3: necrosis extending to the gingival margin
- Stage 4: necrosis extending also to the attached gingiva
- Stage 5: necrosis extending into buccal or labial mucosa.
- Stage 6: necrosis exposing alveolar bone
- Stage 7: necrosis perforating skin or cheek.

## ZONES

- Bacterial zone: the superficial area consisting of various bacteria and some spirochetes.
- Neutrophil rich zone- follows the bacterial zone and contains leukocytes and bacteria including spirochetes.
- Necrotic zone: consisting of disintegrated cells and connective tissue elements with many large and intermediate spirochetes.
- Spirochetal infiltration zone- the deepest zone that is infiltrated with no other bacteria but with intermediate and large spirochetes.

## MALNUTRITION –INDUCED GINGIVITIS

- Adolescence is a time of rapid growth and independent food choice. It is also a period of heightened caries activity as a result of increased intake of cariogenic substances.
- There is evidence that different food, such as dietary proteins and carbohydrates can affect the buffering capacity of saliva and protein deficiency.

## PUBERTAL GINGIVITIS



- A higher amount of plaque has also been found in primary dentition compared with the mixed and permanent dentition, but the prevalence and severity of inflammation of oral tissues (gingivitis and periodontitis) is low in healthy young children and gradually increases with age.
- Pubertal gingivitis has been seen with increasing frequency in young teenagers which affects the reaction of tissues to corticosteroids.
- The condition ranges from localized inflammation of one or two papillary gingivae, also called 'gingival epulis' to generalized marginal gingivitis.

## DRUG –INDUCED ENLARGEMENT



- Drug induced gingival enlargement and gingivitis are side effects and unwanted outcomes of antiepileptic therapy with phenytoin or immunosuppressive therapy with systemic cyclosporine
- Gingival enlargement is the most significant oral finding and can occur in upto 50% of patient.
- Anticonvulsant drugs-phenytoin
- Immunosuppressors- cyclosporine
- Ca channel blockers-nifedipine,verapamil

## Clinical features

- Peaks – 18-24 months.
- Painless enlargement of interdental papilla become nodular before enlarging more diffusely to encroach upon the labial tissues.
- More frequently found in the anterior segment of the labial surfaces than lingual and posterior segments.
- The lobulations coalesce at the midline, forming pseudopockets and covering more of the crown tooth.

## Gingivitis associated with blood dyscrasias leukemia

- Acute lymphoblastic leukemia mainly occurs in children under 10 years.
- Factors that have been implicated to be etiologic significance are radiation injury, chemical injury, immune deficiency and viral infections.

### CLINICAL FEATURES

Gingiva appears as a swollen, glazed which is red-deep purple in appearance with gingival bleeding.

DIFFUSE ENLARGEMENT: the gingiva mucosa/dicreate tumor like interproximal mass.

## PERIODONTAL DISEASE

- Defined as the disease of supporting tissues of teeth caused by specific microorganism, resulting in progressive destruction of periodontal ligament and alveolar bone with pocket formation, recessive or both.



## CLASSIFICATION OF PERIODONTITIS(American academy of periodontitis)

- I. Adult periodontitis
- II. Early onset periodontitis
- III. Pre-pubertal periodontitis
  - Generalized
  - Localized
- iv. Juvenile periodontitis
  - Generalized
  - Localized

- v. Rapidly progressive periodontitis
- vi. Periodontitis assoc. with systemic disease.
- vii. Necrotising ulcerative periodontitis
- viii. Refractory periodontitis.

## Classification of periodontal diseases(international workshop 1990)

1. Gingivitis
  - Puberty gingivitis
  - Gingival overgrowth
  - Necrotising ulcerative gingivitis
2. Periodontitis
  - Chronic periodontitis
    - Localized
    - Generalized

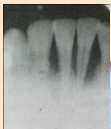
- Aggressive periodontitis
  - Localized
  - Generalized
- Necrotizing ulcerative periodontitis
- Systemic diseases with periodontal manifestation.
  - Malnutrition
  - Neutropenia
  - Diabetes mellitus
  - Hypophosphatasia
  - Down's syndrome
  - Ehlers-down syndrome

## CHRONIC PERIODONTITIS(ADULT ONSET PERIODONTITIS)

- Slow progression of periodontal disease from slight gingival inflammation to advanced bone loss and furcation involvement.
- Can be found in children and adolescents.
- 20% of 14-17 year olds attachment loss-atleast 2mm in one or more sites-slow progression)
- Etiology-bacterial plaque, plaque, porphyromas gingivalis.
- host inflammatory response.

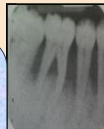
## AGGRESSIVE PERIODONTITIS

- Also called juvenile periodontitis and early onset periodontitis.
- Baer et al in 1972 defined aggressive periodontitis as a disease of the periodontium occurring in an otherwise healthy adolescent, which is characterized by a rapid loss of alveolar bone around more than one tooth of the permanent dentition.
- Localized
- Generalized
- Age of onset
- The rapid rate of disease progression
- The nature and composition of associated subgingival microflora
- Alteration in host immune system



### Localized aggressive periodontitis

Circumpubertal onset.  
Localized first molar/incisor presentation with interproximal attachment loss  
Robust serum antibody response to infecting agents



### Generalized aggressive periodontitis

Affects persons under 30 yrs of age, generalized interproximal attachment loss.  
Pronounced episodic nature of the destruction of attachment and alveolar bone.  
Poor serum antibody to response to infecting agents

## Criteria to define the disease.

- Early onset of the disease during the circumpubertal (between 11 and 13 yrs of age).
- A distinctive radiographic pattern depicting vertical alveolar bone loss at the first permanent molar and at one or more incisor teeth.
- The disease affects only the permanent dentition. The primary teeth are not affected and are not prematurely exfoliated because of destructive periodontal disease.
- The amount of local etiologic factors is not commensurate with the severity of periodontal destruction.
- The disease has a familial pattern.

### CLINICAL FEATURES

- Age of onset 7-13 years mixed dentition.
- Sex ratio: female to male ratio 3:1
- Systemic disease: healthy subjects.
- Presence of local etiologic factors: patient shows smaller amount of local factors, such as dental plaque and supragingival calculus.
- Familial pattern: aggressive periodontitis tends to cluster within families.
- Pattern of attachment and alveolar bone loss: bilateral attachment loss at multiple teeth. Starts at the proximal surfaces of the permanent first molars and /or incisors.

### LOCALIZED PREPUBERTAL AGGRESSIVE PERIODONTITIS

Progress more slowly than generalized form etiology includes leukocyte chemotactic defect involving neutrophils and monocytes.

A. Actinomycetam comitans

CLINICAL FEATURES:

Affects only few deciduous teeth

Primary teeth-bone loss-incisor-molar

### GENERALIZED PREPUBERTAL AGGRESSIVE PERIODONTITIS

- Diseases are rapidly progressive with primary tooth loss occurring 3-4 yrs of age.
- Otitis media and upper respiratory tract infections.
- CLINICAL FEATURES:
- Gingiva-firy red swollen, hemorrhagic.
- Tissues become hyperplatic with granular or nodular proliferations and rapid destruction of alveolar bone.
- Plaque deposition:

### Localized aggressive periodontitis

- Destruction seen around first permanent molar and incisors, and not involving more than two other teeth.
- Etiology: Actinomycetam comitans  
porphyromas gingivalis, bacterioids, spirochetes  
neutrophil function abnormalities

Radiographically, angular defects in the affected permanent molars.

Attachment loss is 3 times the rate of chronic periodontitis 1-4mm/year.

### GENERALIZED AGGRESSIVE PERIODONTITIS

It is characterized by generalized interproximal attachment loss of 3mm or more affecting at least three permanent teeth other than first molars and incisors.

Seen at around puberty

Pronounced episodic destruction of periodontal attachment and alveolar bone.

ETIOLOGY: P.gingivalis, p.intermedia, f.nucleatum. AA

### Treatment consideration

- Oral hygiene instructions.
- Reinforcement and evaluation of the patients plaque control.
- Supra and sub gingival scaling and root planning to remove microbial plaque.
- Control of other local factors.
- Occlusal therapy as necessary.
- Periodontal surgery as necessary.
- Periodontal maintainece.

## PERIODONTITIS ASS. WITH SYSTEMIC DISEASES

### DOWN SYNDROME

- Is an autosomal chromosomal anomaly resulting from trisomy of the chromosome 21.
- Prevalence of periodontal diseases is almost 100 % in children with downs syndrome.
- Periodontal disease severe, in the region of lower anterior teeth.
- Progression is rapid primarily in younger age geroup.
- Periodontitis affects both the primary and permanent dentition.



## Clinical features

- Profound inflammatory lesions of gingiva and dense infiltration.
- Loss and destruction of periodontium and eventually tooth loss.

### TREATMENT

Early preventive periodontal therapy, including vestibular extensions, frenectomies and grafts should be considered.

Oral hygiene measures:encouraging independence in daily oral hygiene, follow up with specific recommendations on brushing methods or toothpaste adaptations.

Periodic preventive care including scaling and root planning.

Some patients benefit from the daily use of an antimicrobial agent such as chlorhexidine.

- Recommend an appropriate delivery method based on patients abilities.rinsing, for example, may not work for person who has swallowing difficulties or one who cannot expectorate. Chlorhexidine applied using a spray bottle or toothbrush is equally efficacious.
- Topical antimicrobial agents(e.g peridex,listerine) may be indicated on a long term basis for these individuals. Other delivery methods such as gels or sprays may be helpful.
- Systemic antimicrobials agents, particularly tetracycline maybe helpful.

## Ehlers-danlos syndrome



- Group of hereditary disorders of connective tissue.

Ten types, type VIII is autosomal dominant and periodontal implications.

The distinguishing finding in ehlers danlos syndrome is early-onset periodontitis,leading to premature loss of permanent teeth.

### ORAL MANIFESTATION

Fragile and easily traumatised oral mucosa and gingival tissues.

Prolonged bleeding,gingival recession, alveolar bone loss.

Loss of some or all permanent teeth often at young age.

Hypermobility of TMJ.

## PAPILLON-LEFEVRE SYNDROME

- Autosomal recessive inheritance

### CLINICAL FEATURES

Extensive loss of periodontal attachment.

Severe and rapid destruction of the alveolar bone around the primary and permanent teeth, premature loss of primary teeth and permanent teeth.

Microdontia, root resorption, incomplete root formation.



### RADIOGRAPHIC FEATURES

- Interproximal angular defects and furcation radiolucency in primary and mixed dentition.
- Severe loss of alveolar bone around the teeth, which appear to be floating in air.

### TREATMENT

There's still no real treatment to help those who suffer from this disease than to keep all their natural teeth, though their exfoliation and loss to be delayed.

## LEUKEMIAS



- Comprise a group of malignant neoplasms characterized by an uncontrolled proliferation of leukocytic stem cells.
- The gingiva may appear cyanotic, with blunting of the gingival margin and hyperplasia beginning in the interproximal papilla.
- Gingival bleeding is common finding.
- Generalized loss of trabeculum in the bone, loss of lamina dura.
- Widening of the PDL space, displacement of developing tooth buds and possible exfoliation of tooth may occur.

## Treatment

- Removal of pseudomembrane under topical anesthesia.
- Rinsing of mouth with 3% hydrogen peroxide in with warm water once in every 2hr.
- 400mg of metronidazole for 7 days, and a mild analgesic-antipyretic is administered for 5 days.
- Plaque control measures should be given and patient recalled after 5 days.

## CYCLIC NEUTROPENIA

- It is an unusual form of agranulocytosis characterized by periodic/cyclic diminution in circulatory polymorphonuclear neutrophilic leukocytes.
- Oral manifestation include oral mucosal ulcers, severe gingivitis and periodontitis. Periodontal destruction can affect both primary and permanent dentition and can lead to premature exfoliation of teeth.
- Periodontal destruction is usually more severe if the cyclic neutropenia starts in infancy and childhood.
- Gingival recession and splaying of lower incisor caused by advanced periodontal disease seen commonly.

## Treatment

- Detailed instruction in mechanical plaque control, scaling avoided during periods of recurrent neutropenia to prevent bactereraemia, rinsing the mouth twice daily with 0.2% chlorhexidine digluconate.
- Periodontal surgery-pockets surgically eliminated.
- Prosthetic rehabilitation: partial destruction to replace the missing dentition.
- Maintenance phase: recalled once every 3 weeks for re-valuation of the periodontal status.

## Human immuno deficiency virus infection and AIDS

- Pathologic entity caused by infection with a retrovirus-human immunodeficiency virus(HIV)
- 3 major forms of periodontal diseases strongly co related with HIV infection.
  1. Linear gingival erythema.
  2. Necrotic ulcerative gingivitis
  3. Necrotic ulcerative periodontitis

## NECROTIZING ULCERATIVE PERIODONTITIS (NUP)

- NUP is an extension of necrotizing ulcerative gingivitis (NUG) into the periodontal structures, leading to attachment and bone loss.

### Signs and symptoms:

Necrosis and ulceration of interdental papilla and or gingival margin.

Painful, bright-red marginal gingiva that bleeds on even slight manipulation.

Mouth malodour (halitosis)

SYSTEMIC MANIFESTATIONS:

Fever, malaise, lymphadenopathy.

Contributing factors to NUP: Inc. levels of stress, poor nutrition.

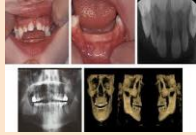
## HYPOPHOSPHATASIA (RATHBUN-SYNDROME)

It is hereditary disease first recognized by Rathbun in 1948, transmitted as a recessive autosomal characteristic.

2 basic disorder is a deficiency of the enzyme alkaline phosphatase in serum or tissues and excretion of phospho-ethanolamine in urine.

Infantile features it is divided in 3 forms

1. Infantile severe rickets
  - Hypercalcemia
2. childhood premature loss of deciduous teeth
  - increased infection
3. adult spontaneous fractures
  - Osseous radiolucencies



### CLINICAL FEATURES:

Premature loss of primary teeth to severe bone abnormalities leading to neonatal death.

In mild forms early loss of primary teeth usually lower incisors is 1<sup>st</sup> clinical sign.

Pulp chamber may be abnormally large and abnormal cementum.

Deficient or defective serum alkaline phosphatase may be etiological factor.

Diagnosed confirmed by low serum alkaline phosphate, inc. phosphoethanolamine in urine and radiological examination of bone

- Treatment
- Extraction of affected mobile primary teeth to prevent discomfort.

## CHEDIAK-HIGASHI SYNDROME

- It is an uncommon genetic disease, arises from a mutation of lysosomal trafficking regular protein which leads to decrease in phagocytosis.

### • Etiology:

It is transmitted as an autosomal recessive trait.

### Clinical features:

Oculocutaneous albinism

Photophobia

Recurrent infection

Hepatosplenomegaly.

O/M-ulceration of oral mucosa, tongue and hard palate.

Severe gingivitis, loss of interdental papilla and periodontitis



## CYCLIC NEUTROPENIA

- It is an unusual form of agranulocytosis characterized by periodic or cyclic diminution in circulating polymorphonuclear neutrophilic leukocytes.

### Oral manifestation:

1. Severe gingivitis, gingival ulcerations, and periodontitis
2. Recurrent infections such as otitis media and upper respiratory infections



Figure 2. Severe oral clinical manifestation of cyclic neutropenia.

## INSULIN DEPENDENT DIABETES MELLITUS (TYPE 1)

- A syndrome of disturbed glucose homeostasis caused by a deficiency of insulin or of its action resulting in abnormal metabolism of carbohydrate, protein and fats.
- In individuals with type 1 diabetes mellitus, the fasting blood sugar level more than 120mg/dl.
- There is increase incidence of gingivitis, inc risk and earlier onset of periodontitis (10-15% teenagers) and alveolar bone resorption.
- Dec function of neutropenia is seen.
- Xerostomia is recurrent gingival abscess may be present.
- Reduced salivary flow leads to inc. caries risk.
- Altered oral microflora with inc. candida albicans, hemolytic streptococci and staphylococci is seen.

## Treatment

- Advising the patient to take normal diet before dental appointment to prevent hypoglycaemia.
- If dental procedure is anticipated to be successful, consultation with the physician for adjustment in insulin dosage.
- Prophylactic antibiotic is recommended before the procedure
- If hypoglycaemia is encountered during dental treatment glucose should be administered.



## MUCOGINGIVAL PROBLEMS

### 1) Gingival recession

Gingival recession is often observed in children several factors predispose patients to gingival recession.

- These factors include:
  - Presence of a narrow band of attached or keratinized gingiva.
  - Alveolar bony dehiscence.
  - Toothbrush trauma.
  - Tooth prominence.
  - Impinging frenum attachment.
  - Soft tissues impingement of opposing occlusion.
  - Orthodontic tooth movement.
  - Use of impression techniques including subgingival tissue reaction.
  - Oral habits
  - pseudorecession

(ii) Localized areas of gingival recession ('stripping')

Usually due to labial malposition of tooth

Most common in lower incisors.

The areas may be difficult to clean.

(iii) Periodontal pockets

Pocket depth exceeding the width of attached gingiva. Lower incisors are most commonly involved in children the defect may result from labial positioning of tooth erupting through a band of attached gingiva.

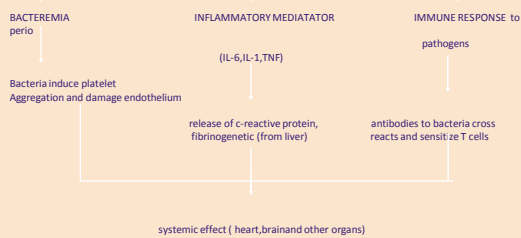
(iv) Abnormal frenum attachment

A frenum is a membranous fold that joins two parts and restricts the individual movement of each.

Abnormal frenum attaches apically to the free gingival margin so as not to pull on the zone of attached gingiva, usually terminating at the mucogingival junction.

### Systemic effects of gingival and periodontal diseases

#### Gingival and periodontal diseases



## TREATMENT OF PERIODONTAL DISEASES

1. Initial cause-related therapy to eliminate or control plaque infection.
2. Corrective therapy to provide therapeutic measures and restore function and aesthetics.
3. Supportive (maintenance therapy) to prevent diseases, recurrence and progression with follow up recalls arranged at a time interval appropriate to diagnosis.

## Initial therapy

- Baseline indices of periodontal status.
- Plaque control instruction.
- Interdental cleaning, toothbrush usage advice.
- Advise on dentifrices and mouthrinse.
- Scaling and elimination of plaque retention factors.
- Monitoring the response to initial therapy
- Repeating indices again.

## CORRECTIVE THERAPY

- Periodontal surgery.
- Adjunctive antibiotics indicated.
- Orthodontic therapy.
- Mucogingival therapy

## SUPPORTIVE THERAPY

- Recall at intervals appropriate to diagnose.
- Monitor periodontal status.
- Remotivate and educate child and parent.
- Repeat plaque control instructions.

## CONCLUSIONS

- Although there is much lower prevalence of destruction of periodontal diseases in children than in adults, children can develop severe forms of periodontitis.
- Paediatric dentist have an important role in play in early recognition and diagnosis of gingivitis and periodontal diseases to optimize treatment outcomes.

## REFERENCES

- Clinical periodontology- caranza 10<sup>th</sup> edition.
- Dean, medonald, avery. Dentistry for child and adolescent. India
- Textbook of pediatric dentistry SG Damle 3<sup>rd</sup> edition.
- Textbook of pediatric dental medicine DONALD J. FORRESTOR