

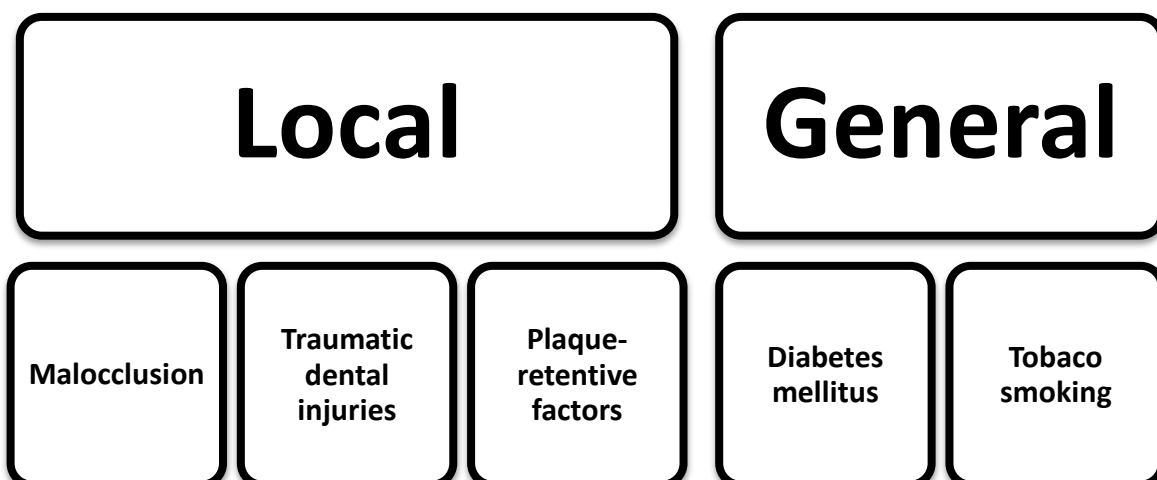
## “Periodontal disease in children”

Periodontitis, an inflammatory disease of the gingiva and deeper tissues of the periodontium, is characterized by pocket formation and destruction of the supporting alveolar bone. Bone loss in children can be detected on bitewing radiographs by comparison of the height of the alveolar bone with that of the cemento-enamel junction. Distances between 2 and 3 mm indicate questionable bone loss, and distances greater than 3 mm indicate definite bone loss. Periodontal probing for attachment loss and bitewing radiography are often used for the clinical confirmation of the diagnosis. Bone loss is usually between the primary first and second molars.

Observations made with respect to periodontal disease in children include the following:

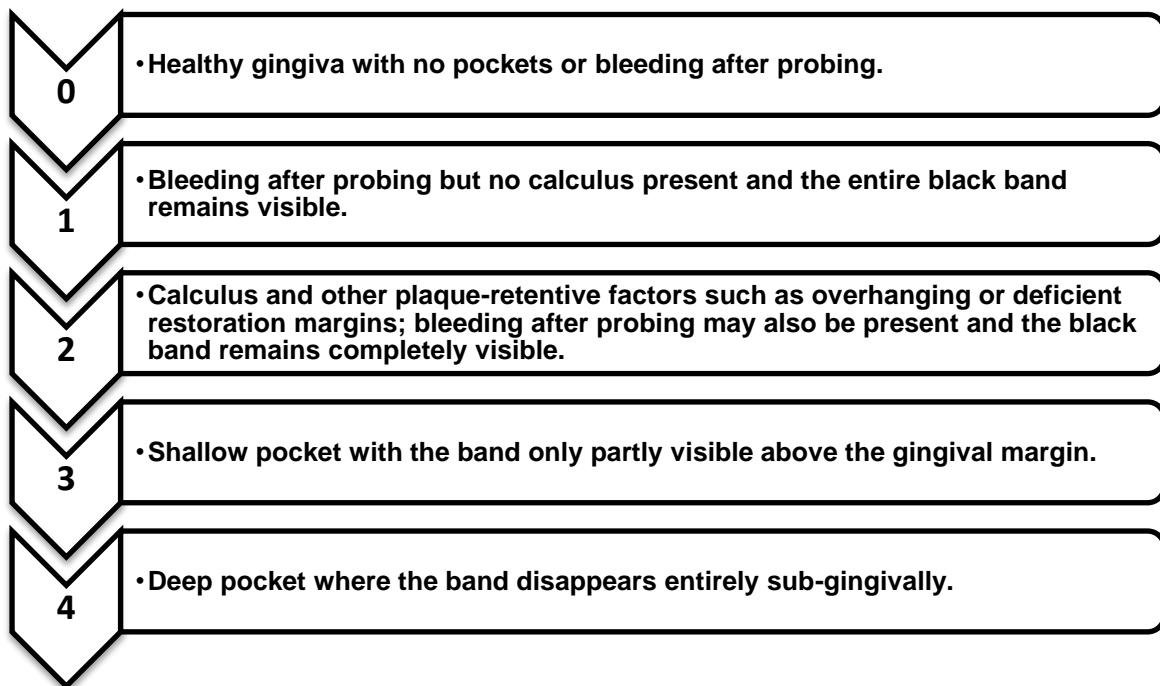
- The prevalence of periodontal destruction correlates positively with DMF teeth or surfaces.
- When loss of attachment occurs at interproximal sites, it is a consequence of pathological change and correlates closely with the presence of sub-gingival calculus.
- When the loss of attachment occurs on buccal or palatal surfaces, it is more often associated with trauma from an incorrect brushing technique than with an inflammatory response.

### ❖ Risk factors for periodontal diseases:



## ❖ Screening for periodontal diseases in children:

The Basic Periodontal Examination (BPE) involves recording the single most severe code for each sextant of the dentition after probing the gingival and periodontal pockets with a 0.5mm ball-ended WHO 621 probe which has a black band between 3.5 and 5.5mm from the tip of the ball end. The codes are in the range (0 – 4) are defined as follows:



An asterisk (\*) was also introduced into the system to denote a sextant that has a tooth with furcation involvement or where the pocket depth and the degree of gingival recession is  $\geq 7\text{mm}$ . The codes help to inform the clinician of the treatment need in each quadrant, with plaque control measures being indicated for lower scores (1 & 2) and sextants with higher scores (3 & 4) requiring scaling, root surface instrumentation, and possibly referral to a specialist periodontist.

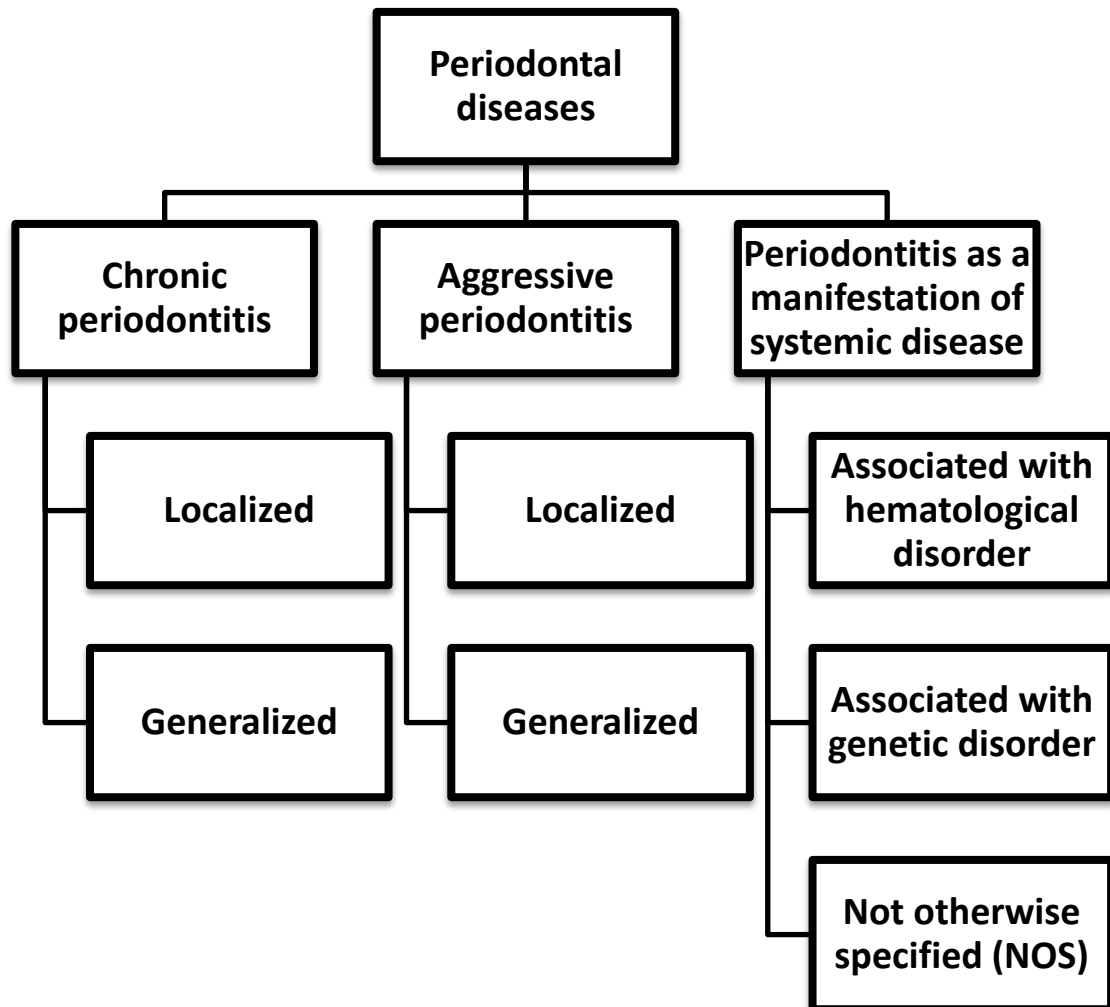
The BPE was modified to be used for those who are under 18 years of age by taking into consideration the presence of false pockets that are associated with the developing dentition and periodontium. This simplified BPE involves the following:

- Using six index teeth—16, 11, 26, 36, 31, and 46.
- Using codes 0, 1, and 2 for children between 7 and 11 years of age as false

pockets are particularly prevalent and likely to overestimate the treatment need.

- Using the full range of codes for children and adolescents between 12 and 18 years. If codes 3 or 4 are found, an intra-oral radiograph may be indicated to check for bone loss.

### ❖ **Types of periodontal diseases in children:**



### ❖ **Chronic periodontitis:**

Chronic periodontitis is bacterially-induced inflammation of the periodontium. It may range in severity from slight to moderate to severe.

Chronic periodontitis can be either localized involving less than 30% of sites or it could be generalized encompassing more than 30% of the sites.

#### **Clinical features:**

- |                              |                        |
|------------------------------|------------------------|
| 1- Pocket formation.         | 4- Tooth mobility.     |
| 2- Bleeding.                 | 5- Gingival recession. |
| 3- Alveolar bone resorption. | 6- Furcation lesion.   |

## ❖ Aggressive periodontitis:

Aggressive periodontitis is used as a generic term to describe a heterogeneous group of periodontal diseases occurring in younger individuals who may or may not be otherwise healthy.

It can be viewed as two categories of periodontitis that may have overlapping aetiologies and clinical presentations:

- 1- A generalized form (generalized aggressive periodontitis [GAP]).
- 2- A localized form (localized aggressive periodontitis [LAP]).

Prompt diagnosis is essential if treatment is to be successful, and the periodontal status must be monitored regularly to ensure that the treated disease remains quiescent.

Aggressive periodontal diseases were previously known as early onset diseases, namely prepubertal and juvenile periodontitis. A classification system for periodontal diseases and conditions published in 1999 effectively combined these two diseases into one—aggressive periodontitis. This classification removed the arbitrary age limitations that were previously implied by terms such as prepubertal, juvenile, and even adult periodontitis. It is now recognized that aggressive periodontitis can affect the primary and permanent dentitions in both localized and generalized forms.

### ➤ Generalized aggressive periodontitis (GAP):

The onset of GAP is during or soon after the eruption of the primary teeth. It results in severe gingival inflammation and generalized attachment loss, tooth mobility, and rapid alveolar bone loss with premature exfoliation of the teeth. The gingival tissue may initially demonstrate only minor inflammation with plaque accumulation at a minimum. It often affects the entire dentition. Alveolar bone destruction proceeds rapidly, and the primary teeth may be lost by 3 years of age. Boys were more likely to have GAP than were girls (ratio, 4.3:1)

Testing may reveal a high prevalence of leukocyte adherence abnormalities and an impaired host response to bacterial infections.

### ➤ **Localized aggressive periodontitis (LAP):**

LAP is localized attachment loss and alveolar bone loss in an otherwise healthy children and adolescents without clinical evidence of systemic disease. The exact time of onset is unknown, but it appears to arise around or before 4 years of age, when the bone loss is usually seen on radiographs around the primary molars and/or incisors. Abnormal probing depths with minor gingival inflammation, rapid bone loss, and minimal to various amounts of plaque have been demonstrated at the affected sites of the child's dentition. Abnormalities in host defences (e.g., leukocyte chemotaxis), extensive proximal caries facilitating plaque retention and bone loss, and a family history of periodontitis have been associated with LAP in children. As the disease progresses, the child's periodontium shows signs of gingival inflammation, with gingival clefts and localized ulceration of the gingival margin.

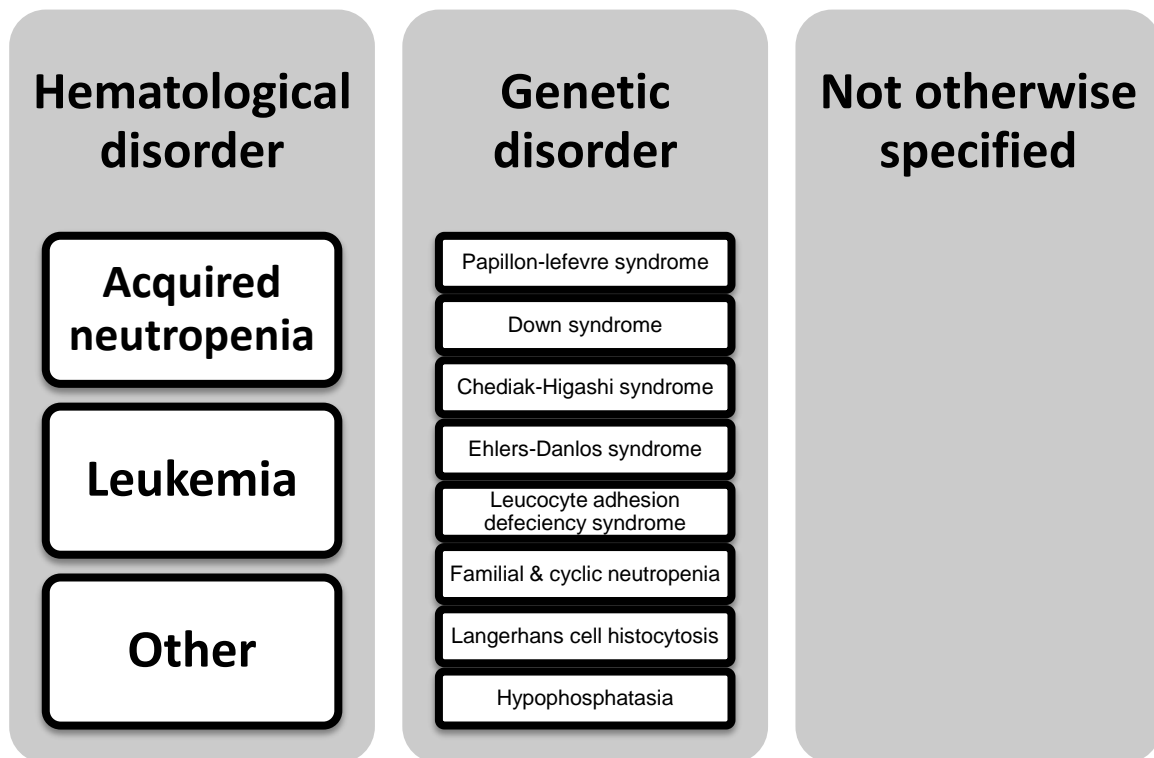
Clinically, LAP patients have less tissue inflammation and very little supragingival dental plaque or calculus. However, they do present with evidence of subgingival plaque accumulation, both tissue-associated and tooth-associated. Progression of bone loss is three to four times faster than in chronic periodontitis. LAP is not thought to be a single disease entity.

### **Treatment of aggressive periodontitis:**

Successful treatment of aggressive periodontitis depends on early diagnosis, the use of antibiotics against the infecting microorganisms, and the provision of an infection free environment for healing. Treatment of aggressive periodontitis, both LAP and GAP, includes:

- Oral hygiene instructions
- Consultation with the patient's physician if necessary.
- Mechanical removal of supragingival and subgingival microbial agents via nonsurgical and/or surgical treatment modalities with adjunctive antimicrobial therapy.
- A combination regimen of amoxicillin and metronidazole over 1 to 2 weeks.
- The use of tetracyclines to treat aggressive periodontitis in children should be avoided because this could cause discoloration of teeth. Likewise, tetracyclines should not be prescribed to pregnant mothers.

## ❖ Periodontitis as a manifestation of a systemic disease:



### ➤ Papillon-Lefèvre syndrome:

This syndrome is characterized by palmar–plantar hyperkeratosis, premature loss of primary and permanent dentitions, and ectopic calcifications of the falx cerebri. Some patients show an increased susceptibility to infection.

The syndrome is an autosomal recessive trait with a prevalence of about 1-4 per million of the population. Consanguinity of parents is evident in about one-third of cases. Rapid and progressive periodontal destruction affects the primary dentition with an onset at about 2 years. Exfoliation of all primary teeth is usual before the permanent successors erupt, and patients may be edentulous by the mid to late teens. Cases of a late onset variant of PLS have also been described in which the palmar– plantar and periodontal lesions are relatively mild and only become evident in the permanent dentition. An extensive family dental history supported by clinical, laboratory, and radiographic examinations confirms the diagnosis.

A case reported in the literature involved observation of Papillon-Lefèvre syndrome in a 2 ½ years old child. Hyperkeratosis of the palms and soles was present; the first evidence was erythema and scaliness noted initially at 8

months of age. The primary teeth erupted at the normal time. However, as early as 2 years of age, the child rubbed the gingival tissues and acted as if they were painful. There was a tendency toward gingival bleeding when the teeth were brushed. At 2½ years of age, all the primary teeth showed looseness, and full-mouth radiographs revealed severe horizontal bone resorption. Because of gingival inflammation, patient discomfort, and the presence of infected periodontal pockets, all the primary teeth were removed by 3 years of age. Subsequently, complete dentures were constructed 3 months after the removal of the primary teeth. The child tolerated the denture well, both functionally and psychologically. The first permanent molars and mandibular central incisors erupted at the expected time, and the denture base was adjusted to allow the emergence of the erupting teeth.

Although previous reports have indicated that the permanent dentition will also be affected, this child has been followed into young adulthood, and the dentition, including the supporting tissues, appears normal. The reason was owing to the repeated tetracycline antibiotic the patient was taking to treat ear infection between the age of 3 and 6 years. This regimen may have been responsible for eliminating pathogens and preventing the destructive process from being carried into the permanent dentition.

### **Management:**

No treatment is particularly successful. However, Intensive periodontal therapy with specific antibiotic therapy against the causative organisms may be successful in delaying the inevitable exfoliation of teeth.

Extraction of any remaining primary teeth before eruption of the permanent teeth has been advocated to provide an edentulous period before permanent teeth eruption.

All patients require planned full clearances and dentures to avoid pain and disfigurement. It is important to consider proceeding with extractions soon after the eruption of the permanent dentition to minimize excessive bone loss.

### **➤ Gingival recession:**

Gingival recession is often observed in children. Several factors predispose patients to gingival recession. These factors include the presence of a narrow band of attached or keratinized gingiva, alveolar bony dehiscence, toothbrush trauma, tooth prominence, impinging frenum attachment, soft tissue

impingement by opposing occlusion, orthodontic tooth movement, use of impression techniques including subgingival tissue retraction, oral habits, periodontitis, pseudorecession (extrusion of teeth), and intraoral piercings, such as tongue piercings.

Recession is dealt with conservatively by elimination of the etiology if possible, while excellent oral hygiene is maintained in the affected areas. If the recession of the affected area remains unchanged (non-progressive) or improves, continued periodic monitoring is recommended. If the recession has progressed after a 4- to 8-week period of observation, other periodontal procedures may be required based on the identified predisposing factor.

### ➤ **Self-mutilation:**

Self-mutilation is a term used to describe the purposeful harm of children to their oral structures. Self-mutilation probably occurs more frequently than is realized because relatively few children will admit to the act unless they are observed practicing it. Therefore the self-inflicted lesions may be incorrectly diagnosed. Dentists should be aware of the possibility of this condition and should approach the problem in the same manner as they do thumb sucking. An attempt should be made to determine the cause. If it is found to be the result of local dental factors, it can be corrected. However, in the majority of children an emotional problem is involved, and the family must be directed to competent counselling services. Children as young as 4 years of age have been observed who have traumatized the free and attached gingival tissues with a fingernail, occasionally to the extent that the supporting alveolar bone has been destroyed.

Self-mutilation by biting has been associated with severe emotional disturbances such as congenital insensitivity to pain and autism. Management requires a choice between the initial uses of protective appliances vs. surgical procedures. Mouthguards are helpful for children with congenital indifference to pain until they are mature enough to appreciate and avoid self-mutilating behaviours.

### ❖ **References:**

- Dean, JA. et al. 2015. *McDonals and Avery's Dentistry for the child and adolescent*. 10<sup>th</sup> edition. Missouri: Elsevier.
- Welbury, R. et al. 2012. *Paediatric Dentistry*. 4<sup>th</sup> edition. Oxford: Oxford University Press.