INTRAORAL SOFT-TISSUE AND HARD TISSUE PROCEDURES

The commonly seen soft-tissue pathologic conditions in pediatric dentistry are: mucocele, ranula, fibroma, pyogenic granuloma, and high frenal attachment.

-Mucoceles and ranula: A mucocele or mucous retention cyst is a benign pathologic lesion resulting from the extravasation of saliva secondary to the rupture of a minor salivary gland duct. The collection of extravasated fluid develops a fibrous wall around itself, forming a pseudocyst.
On palpation, the lesion can be fluctuant or firm, depending on its fluid-filled state.
Clinically, the overlying mucosa may have the same coloration as the lower lip or have a bluish hue. The lesion is non-painful and soft, the lesions of longer duration may appear firmer and fibrotic and be difficult to distinguish from a fibroma. The most common location of mucocele is the lower lip, which is a site that is frequently traumatized by biting. Other common locations include the floor of the mouth which is called ranulas.

Treatment: Occasionally mucoceles have been reported to rupture spontaneously. For those that persist, treatment consists of surgical excision with removal the fibrous capsule and any associated minor salivary glands to prevent recurrence.

Ranulas are treated by marsupialization or removal of the lesion and the associated salivary gland.

-Fibroma: is one of the most common soft tissue benign tumors of the oral cavity in children. These masses represent hyperplasias which develop due to the local irritation or trauma to mucosal tissue. The most frequent locations are mucosal sites that are easily traumatized, such as the buccal mucosa, the labial mucosa, and the lateral tongue.

-Pyogenic granuloma: is a benign soft tissue lesion that is thought to result from chronic irritation, trauma, and hormonal factors. Despite its name, it is a vascular proliferation and not a true granuloma, which are most of the oral lesions in children. Clinically, the lesions appear as sessile or pedunculated nodules, ranging in size from a few millimeters to 2 cm, with a bright red color and a smooth or ulcerated surface. The most

common site is the gingiva, other common sites are the lips, tongue, buccal mucosa, and palate.

Treatment:

Conservative surgical excision is the treatment of choice for both the fibroma and the pyogenic granuloma and the specimen submitted for histological evaluation to obtain a definitive diagnosis. If the source of chronic trauma is not eliminated, the lesion may recur.
Lesions that are obviously benign and are not interfering with function or causing emotional distress can be left in the young child and removed, if necessary, at a later date.

-High frenal attachement:

1.Maxillary Labial Frenectomy

Surgical procedure is only performed when the high maxillary labial frenum is a causative factor for diastema between maxillary central incisors until permanent canines have erupted, i.e. until the age of 11 to 12 years.

2. Mandibular Labial Frenectomy

Is indicated when a lower lip tie put too much tension on the gingiva, giving cause to potential future problems or the lip tie is in an unusual eccentric position probably by a minor genetic defect.

3. Lingual Frenotomy

A lingual frenotomy (simple cutting of the frenulum): it is a simple and quick procedure, indicated in those infants where a significant tongue-tie is affecting breast-feeding. A lactation consultant or speech pathologist must assess attachment and feeding practices in order to determine the need for a frenotomy. It is normally performed on babies from birth to 4 months of age. Local anesthesia is usually not required .
The frenum is usually a very fine translucent tissue in babies, although clinicians should be aware of the risk of a small amount of bleeding and possible postoperative infection. To minimize the risk of infection, parents are advised to sterilize/disinfect any nipple shields, pacifiers and bottles adequately .

Clinical procedure of lingual frenotomy:

-The infant is wrapped (swaddled) to minimize movement .
-A Lorenz retractor is used to retract the ventral surface of the tongue and to stretch the lingual frenulum.
-Blunt-ended scissors are used to release the lingual frenulum taking care not to injure the submandibular ducts or the ventral surface of the tongue. The cut is made superior to wharton's (submandibular) duct extending posteriorly but not involving muscle .
-Once the frenum is released, the baby is immediately placed on the

breast /bottle to begin feeding. Postoperative feeding helps to comfort the baby and assists in haemostasis .
-Once haemostasis is achieved, the baby can be discharged .
Reports indicate that this simple procedure leads to successful breast-feeding in most cases.

4- Lingual Frenectomy

A frenectomy is normally carried out under local anesthesia in older children and under general anaesthesia in younger children.

The head and neck infections:

The etiology of head and neck infections may be secondary to sinus, salivary gland, skin, or middle ear infections or it may be duo to odontogenic infection.
The infection worsens if the cause is not removed or when the causative factor treated inappropriately with repeated antibiotics or when the appropriate antibiotic is not selected based on the etiology or with particularly virulent organisms then an abscess may develop. Infections can progress rapidly in both the pediatric patient and the adult patient; however, the pediatric patient is especially susceptible to becoming rapidly dehydrated and systemically ill from what may appear to be a relatively minor infection.

Cellulitis

Cellulitis is a diffuse infection of the soft tissues that is seen more frequently in younger children. It is similarly caused by primary or permanent pulpal necrosis and is characterized by considerable swelling of the face or neck due to collateral edema and a spreading fascial infection, the tissue appears dark and brawny. Cellulitis may be very serious and life threatening.
-If a maxillary tooth is involved, the swelling and redness may involve the eye and, if untreated, may spread posteriorly to involve the brain with an abscess or cavernous sinus thrombosis.
-If a mandibular tooth is involved, the infection will spread to the floor of the mouth along the fascial planes. An infection involving submandibular, sublingual, and submental spaces is termed Ludwig's angina. In this condition the tongue and floor of the mouth become elevated to the extent that the patient's airway is obstructed and swallowing is impossible (Dysphagia).

Diagnosis of head and neck infection:

-The first step is to obtain a history, including details about both the patient's present illness and the patient's past medical and surgical history.

-The second step is the clinical examination includes visual inspection, identifying the swelling and the severity, palpation of the tissues to discern their tenderness and consistency (cellulitic or fluctuant), assessment of maximal mouth-opening, examination of the dentition.
-The third step is the radiographic examination, it may consist of a periapical or panoramic radiograph, however, this may be difficult to obtain if the child's head and neck are swollen with trismus and limited mouth opening. Severe fascial space infections may require a CT scan.

Clinical Presentation

Cellulitis	Abscess
• A hard, brawny swelling, tender and warm to touch.	• A soft usually fluctuant, painful swelling and warm.
• Diffuse	• Usually circumscribed, may be very well localized in the mouth or more diffuse if extraoral.

Treatment:

-Antibiotics are usually indicated in these children. A broad-spectrum antibiotic should be prescribed early to reduce the possibility of the infection, localizing and draining on the outer surface of the face and penicillin remains the drug of first choice in non-allergic patients or clindamycin.
-If the patient is not going to have a general anesthetic, the site must be anesthetized with local anesthesia. Regional block anesthesia without infiltrating the infective site is recommended.
- Incision of soft tissue to establish drainage is not indicated in the early stages of cellulitis because of the diffuse, poorly localized nature of the infection.
-Surgery includes incision and drainage by opening the pulp chamber of the affected tooth and removal of the source of infection (which may involve root canal treatment or extraction). Then a small hemostat (mosquito) is inserted with the beaks closed. Blunt dissection is performed with the beaks closed. The beaks are opened and withdrawn. The hemostat beaks are never closed blindly when the instrument is in the wound, to prevent injury to vital structures. A drain may be placed into the incision and drainage site and secured with a non resorbable suture for a few days. The drain keeps the wound open and patent, facilitating irrigation (if necessary) and spontaneous drainage of the wound and preventing a recurrent collection from developing.
-Hospitalization is indicated in children with severe cellulitis who are systemically unwell with fever, dysphagia, poor oral intake, dehydration, and involved several fascial spaces for providing supportive care, such as

hydration, nutritional support, and fever management and also Hospitalization is indicated in any case involving a spreading infection to the mouth floor because maintenance of a patent airway may require.

HARD-TISSUE SURGERY

-Odontoma:

Odontomas are the most frequently occurring odontogenic tumors seen in pediatric patients. They are frequently discovered when the patient presents for evaluation of an unerupted tooth or incidentally during routine radiographic examination.

There are two types of odontomas:

- ✓ Compound odontoma: a compound odontoma represents multiple tooth like structures.
- ✓ Complex odontoma: has irregularly shaped masses of enamel with no anatomic resemblance to a tooth.

-Treatment for an odontoma involves simple enucleation and curettage, the specimen is sent for biopsy.

-Implantology:

The use of implants in young patients creates special problems because the following reasons:

1-Their jaws are in a period of active, dynamic growth.

2-The implants when inserted into pediatric patients do not follow the regular growth process of the craniofacial skeleton and are known to behave similar to ankylosed teeth, that ankylosis arrests both dental eruption and alveolar bone formation in the affected area, resulting in both functional and esthetic problems.

3-The implants could interfere with the position and the eruption of adjacent tooth germs, thus resulting in potential severe trauma to the patient.

There are exceptions for instance, children who suffer from severe psychological stress due to extended hypodontia or even anodontia and congenital syndromes such as ectodermal dysplasia (characterized by an aplasia or dysplasia of tissues of ectodermal origin—hair, nails, skin, teeth). In affected patients, the extensive lack of both deciduous and permanent teeth results in atrophy and a reduced growth rate of the affected alveolar processes. These pediatric patients can benefit remarkably from an implant-supported oral rehabilitation.

-Odontogenic cysts:

Odontogenic cysts are a group of jaw cysts that are formed from tissues involved in odontogenesis (tooth development). Odontogenic cysts are closed sacs, and have a distinct membrane derived from rests of odontogenic epithelium.

1-Dentoalveolar Cyst (Radicular cyst)

It is the most common odontogenic cyst. It is an epithelium-lined sac containing fluid; usually found at the apex of a pulp-involved tooth or laterally, the cyst has lining that is derived from the epithelial cell rests of malassez.

Treatment

Surgical options have done for previously treated teeth that would not benefit from root canal therapy, include cystectomy or cystostomy which is recommended for larger cysts that in close proximity to important adjacent anatomy such as inferior alveolar nerve.

2-Dentigerous cyst

It is the second most common cysts of odontogenic origin affecting the jaws in children, it is associated with the crown of an unerupted or partially erupted tooth. The cyst cavity is lined by epithelial cells derived from the reduced enamel epithelium of the tooth forming organ.

Marsupialization is the treatment of choice.

3-Eruption cysts

Eruption cyst is a developmental soft-tissue cyst of odontogenic origin that forms over an erupting tooth. It is a cyst like lesion that present as swellings of the alveolar mucosa, the cyst may precede the eruption of both primary and permanent teeth. When filled with blood they are often called eruption haematomas. It is caused by eruption trauma, usually seen in erupting molar areas, it usually resolves spontaneously when the involved tooth penetrates the gingival tissue.

Facial injury

The pediatric dentist may encounter pediatric patients who suffer a traumatic event and injured of the soft and/or hard tissue of the face.

Signs and Symptoms of Maxillary or Midface Fractures

(Patients may present with any or all of the following):

- Altered occlusion
- Numbness in the infraorbital nerve distribution
- Double vision
- Periorbital ecchymosis (bruising)

- Facial asymmetry or edema
- Limited mandibular opening
- Subcutaneous emphysema (skin cracking upon palpation)
- Nasal hemorrhage
- Ecchymosis of the palatal or buccal mucosa
- Mobility or crepitus upon manipulation of the maxilla

Signs and Symptoms of Mandibular Fractures

(Patients may present with any or all of the following):

- Mandibular hemorrhage
- Numbness in the mental or inferior alveolar nerve distribution
- Altered occlusion
- Ecchymosis or abrasion of the chin
- Ecchymosis of the floor of the mouth or buccal mucosa
- Periauricular pain
- Mandibular deviation on opening
- Mobility or crepitus upon manipulation of the mandible.

Initial management of facial fractures should be directed toward:

- Immobilization of fractured segments
- Early antibiotic therapy for open fractures
- Pain control.
- Definitive treatment should then be performed by a qualified specialist