**ORAL SURGERY FOR PEDIATRIC PATIENTS**

**INTRODUCTION:**

The basic principles used in the management of pediatric oral surgical procedures include*:*

* The initial step is a diagnosis, which is developed through a process involving history taking, physical examination, and imaging.
* The pediatric patient’s ability to cooperate must be considered. Depending on the patient’s age and systemic health.
* The clean technique (a sterile technique) which is depending on preventing any organism from the surgical staff, other patient, instruments, or equipment from contaminating the patient. Which requires that the dentist scrubs his or her hands with an antiseptic soap then gloved and to wear the gown covering his or her arms, mask, and eye protection which protect the dentist as they are for the protection of the patient. Sterilized instruments, or equipment should be used.
* Adequate visibility, this entails adequate access, adequate light, and a good suction to create a debris free surgical field. Adequate access requires appropriate mouth-opening. Opening the patient’s mouth can be facilitated with a bite block or a molt mouth prop.

**Indications for teeth extractions**

Indications of teeth extractions for children are much the same as those for adult patients:

Non restorable caries, apical disease, fractures of crowns or roots, supernumerary teeth, impaction, and prolonged retention of primary teeth because of improper root resorption.

-Simple exodontia in the pediatric patient requires minimal modification from that used in the adult which include the following:

(1) The proximity of the deciduous tooth to the succedaneous tooth and the relatively cervical position of the bifurcation in primary molars and it is injudicious to use forceps with deeply plunging beaks as these could damage the underlying permanent successors.

(2) The primary teeth with non resorbed roots will be long, slender, and potentially divergent that mean more expansion of the socket is required for the extraction.

-Radiographic surveys of teeth to be extracted are of prime importance. The dentist should observe the size and contour of the primary roots, the amount and type of resorption, the relation of the roots to the succedaneous teeth, and the extent of disease.

**The dentist and the patient position during surgical procedure**

* **For the extraction of a maxillary tooth:**

-The patient is positioned in the dental chair such that the maxillary occlusal plane is at an angle between 60°and 90°to the floor.

-The dentist stands in front of the patient, with a straight back.

* **For the extraction of a mandibular tooth:**

-The patient is positioned in the dental chair such that the mandibular occlusal plane is parallel to the floor.

-A right-handed dentist during extraction the lower left teeth stands in front of the patient; the patient's mouth is at a height just below the dentist's elbow. While when extracting teeth from the lower right side, the dentist stands behind the patient with the chair as low as possible to allow good vision.

**The steps in teeth extracting:**

-The first step in extracting a tooth is to separate the soft-tissue attachment from the cervical aspect of the tooth. This is most commonly achieved with a #9 Molt elevator which is a dual-ended instrument with one end sharply pointed used to separate the soft-tissue attachment from the tooth.

-The second step is to use a straight elevator to luxate the tooth, it has a concave blade that is placed toward the tooth being luxated. The blades are available in various sizes, and their edges may be serrated to better grasp the tooth, the elevator must rest on the alveolus. The elevator is initially inserted so that the blade of the elevator angled toward the alveolar crest up to 45°from the alveolar crest in the coronal plane. The elevator is then turned such that the portion of the blade resting on the alveolus acts as a fulcrum and the coronal portion of the blade rotates toward the tooth being extracted. This action expands the alveolus, disrupts the periodontal ligament, and establishes initial mobility of the root.

-The last step is to remove the tooth with forceps, which must be appropriately selected, several forceps are available in smaller sizes for the pediatric patient.

**The basic principles in selecting forceps are as follows**:

1. The beaks of the forceps should adapt to the root surface of the tooth.

2. The beaks of the forceps, when positioned and engaging the tooth, should be parallel to the long axis of the tooth.

3. The size of the beaks of the forceps should be small enough not to engage the adjacent teeth during luxation and removal of the tooth.

The beaks of the forceps should be placed under the separated and reflected soft tissue and the tooth firmly engaged. The first force applied by the dentist when using forceps is apically directed. The apically directed force positions the center of rotation as close to the root apex of the tooth, the less likely an apical third root fracture will occur, the apically directed force also disrupts the periodontal ligaments as possible.

**Extraction technique:**

Extracting a tooth is an exercise in administering a controlled force in a slow and deliberate fashion to expand the alveolus and disrupt the periodontal ligaments, such that the tooth can be a traumatically removed from the jaw.

-Rotational forces may be applied for selected roots that are conical (anterior teeth, cuspids, mandibular premolars, maxillary second premolars).

-In general, deciduous anterior teeth should be luxated to the labial aspect during the extraction procedure because of the lingual position of the permanent teeth and posterior teeth should be luxated with buccal and lingual pressures.

Finally, once the alveolus is sufficiently expanded and the periodontal ligament disrupted, a slight coronal tractional forces are applied and the tooth is removed.

The dentist’s opposite hand may be placed such that the index finger or thumb is positioned on either the buccal and/or lingual/palatal aspect of the alveolus which provides:

* feeling the expansion of the alveolus
* retraction of soft tissues to allow visibility and access
* protection the tissues if the instrument slips.
* resistance to the extraction force on the mandible to prevent dislocation.

**Difficulties in extraction**

**1-Root fracture***:* A root tip from a primary tooth may fracture during the procedure; if the tooth root is clearly visible and can be removed easily with an elevator, the root should be removed. However, if removing the root tip poses a significant risk to the adjacent or succedaneous tooth, then the residual root tip should be left in the bone. Usually these root tips do not cause adverse sequelae. They may eventually resorb or migrate toward the gingiva and become exposed with the eruption of the permanent tooth. A post treatment radiograph should be obtained, and the child’s parent should be informed.

2-Although they are rare, the dentist must know when the roots of the deciduous molars are configured such that they could engage the succedaneous tooth and possibly cause the succedaneous tooth to be extracted with the deciduous tooth. If this is recognized radiographically or during the extraction, then sectioning the deciduous tooth with a surgical handpiece may be indicated*.*

**3-Submerged or ankylosed primary tooth:**

A primary tooth may be submerged or ankylosed. Ankylosed teeth may be slightly out of occlusion or they may be completely within the alveolar process. A submerged tooth may have non resorbed divergent roots or may have all or nearly all the root resorbed. Despite having the root significantly resorbed, the tooth may show no signs of mobility when pressure or leverage is applied and exhibit a solid sound on percussion. These teeth may be welded to the surrounding bone. The basic principles pertaining to extraction are followed. A tooth with non-resorbed divergent roots in which the potential for a root fracture is high, may be best extracted if the tooth is sectioned*.*

If luxation is not accomplished with reasonable forceps pressure when the ankylosed tooth is extracted, a surgical approach is required. An intraoperative or postoperative radiograph may be indicated to assess the situation.

**Impacted teeth**

An impacted tooth is one that fails to erupt. Rare is the impaction of a deciduous tooth. The latter is commonly associated with pathology, such as an odontoma or supernumerary tooth*.* An impacted tooth also may be secondary to insufficient space in the dental arch or may be associated with genetic abnormalities.

The most commonly impacted tooth is the third molar, other commonly impacted teeth include the maxillary canine, second premolar, mandibular second molar, and maxillary incisors. The frequency of impaction of the maxillary incisors is most likely secondary to injury, infection, or loss of the deciduous incisors. If the deciduous incisors are lost prematurely, a dense, hyperplastic, fibrous tissue may form over the alveolus, which impedes eruption and contributes to the impaction of the permanent maxillary incisors.

Once an altered eruption pattern is recognized, the dentist must perform a clinical and radiographic examination. Palpation of the buccal, lingual, or palatal aspect may reveal a bulge, suggesting the location of the impacted tooth. When the tooth is not palpable, radiographic imaging is indicated to determine the location of the impacted tooth.

**Management of** **unerupted maxillary central incisors**

A minimal approach can be employed in which a small window is created if the permanent incisor is close to the surface, the attached gingiva is wide and there is extensive preservation possible at the gingival margin. Otherwise, palatal or buccal mucosal flaps should be raised to reveal the tooth.

**Management of an impacted tooth may include:**

(1) Observation,

(2) Extraction of the impacted tooth,

(3) Surgical exposure and assisted eruption: The ideal time for surgical exposure is when the root of the impacted tooth is almost completely formed and the apex is not yet closed.

Exposure of a labially impacted canine, two surgical techniques exist:

A- Apical positioned flap:The flap is reflected and the tooth is exposed, with bone removed to the cervical margin as necessary. The bracket is attached and the flap is repositioned apical to the bracket, ideally at the level of the cervical margin of the tooth.

B- Closed technique: it is indicated for high impactions or midalveolar impactions when the apical positioned flap is contraindicated.

(4) Surgical uprighting: it is a technique that has most commonly been used for bringing an impacted mandibular second molar into occlusion. The optimal time for performing the procedure is when the root is two-thirds formed and the apex is open. The tooth must have a mesial inclination not exceeding 90° and should be neither labially nor lingually inclined, for optimal results.

Excessive mesial inclination has an increased risk for devascularizing the tooth. In this situation the surgical procedure would be more consistent with an autotransplantation than a surgical uprighting.

(5) autotransplantation.

Several factors need to be taken into consideration in deciding the management of the impacted tooth. These include the age and health of the patient, potential pathology associated with the impacted tooth, location and angulation of the impacted tooth, benefit of surgery, frequency and severity of the risks of surgery, risks and consequences of no surgical intervention, and economic consequences of surgical versus non surgical intervention and the quality of life associated with each of these decisions.