

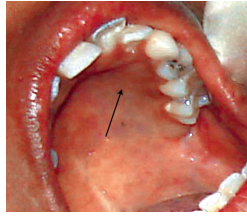
ANESTHETIZATION OF MAXILLARY PRIMARY MOLARS AND PREMOLARS

Traditionally, dentists have been taught that the middle superior alveolar nerve supplies the maxillary primary molars, the premolars, and the mesiobuccal root of the first permanent molar.

- ❖ The bone overlying the first primary molar is thin, and this tooth can be adequately anesthetized by injection of anesthetic solution opposite the apices of the roots.



- ❖ However, the thick zygomatic process overlies the buccal roots of the second primary and first permanent molars in the primary and early-mixed dentition. This thickness of bone renders the supraperiosteal injection at the apices of the roots of the second primary molar much less effective; the injection should be supplemented with a second injection superior to the maxillary tuberosity area to block the posterior superior alveolar nerve, as has been traditionally taught for permanent molars
- ❖ This supplemental injection helps compensate for the additional bone thickness and the posterior middle superior alveolar nerve plexus in the area of the second primary molar, which compromise the anesthesia obtained by injection at the apices only.
- ❖ For anesthetization of the maxillary first or second premolar, a single injection is made at the mucobuccal fold to allow the solution to be deposited slightly above the apex of the tooth.
- ❖ If the rubber dam clamp impinges on the palatal tissue, injection of a drop or two of the anesthetic solution into the free marginal tissue lingual to the clamped tooth alleviates the discomfort and is less painful than the true greater (anterior) palatine injection.
- ❖ The greater palatine injection is indicated if maxillary primary molars or premolars are to be extracted or if palatal tissue surgery is planned.



ANESTHETIZATION OF MAXILLARY PERMANENT MOLARS

- To anesthetize the maxillary first or second permanent molars, the dentist instructs the child to partially close the mouth to allow the cheek and lips to be stretched laterally.
- The tip of the dentist's left forefinger (for a righthanded dentist) will rest in a concavity in the mucobuccal fold and is rotated to allow the fingernail to be adjacent to the mucosa.
- The ball of the finger is in contact with the posterior surface of the zygomatic process. The index finger should point in the direction of the needle during the injection.



NASOPALATINE NERVE BLOCK

- Blocking the nasopalatine nerve anesthetizes the palatal tissues of the six anterior teeth.
- If the needle is carried into the canal, it is possible to anesthetize the six anterior teeth completely.



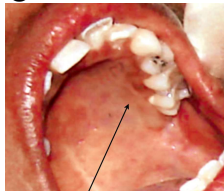
- However, this technique is painful and is not routinely used before operative procedures. If the patient experiences incomplete anesthesia after supraperiosteal injection above the apices of the anterior teeth on the labial side, it may be necessary to resort to the nasopalatine injection. The path of insertion of the needle is alongside the incisive papilla, just posterior to the central incisors. The needle is directed upward into the incisive canal. The discomfort associated with the injection can be reduced by

deposition of the anesthetic solution in advance of the needle. When anesthesia of the canine area is required, it may be necessary to inject a small amount of anesthetic solution into the gingival tissue adjacent to the lingual aspect of the canine to anesthetize overlapping branches of the greater palatine nerve.



GREATER (ANTERIOR) PALATINE INJECTION

The greater palatine injection anesthetizes the mucoperiosteum of the palate from the tuberosity to the canine region and from the median line to the gingival crest on the injected side.



- This injection is used with the middle or posterior alveolar nerve block before surgical procedures.
- The innervation of the soft tissues of the posterior two thirds of the palate is derived from the greater and lesser palatine nerves.
- Before the injection is made, it is helpful to bisect an imaginary line drawn from the gingival border of the most posterior molar that has erupted to the midline. Approaching from the opposite side of the mouth, the dentist makes the injection along this imaginary line and distal to the last tooth



In the child in whom only the primary dentition has erupted, the injection should be made approximately 10 mm posterior to the distal surface of the second primary molar. It is not necessary to enter the greater palatine foramen. A few drops of the solution should be injected slowly at the point where the nerve emerges from the foramen.

Periodontal Ligament Injection (Intraligamentary Injection)

This is used as adjunct to the other injection techniques. The needle is placed in the gingival sulcus (preferably on the mesial side) and is advanced deeper down until resistance is obtained. About 0.2 ml of the solution is deposited. Since greater pressure is required to deposit the

solution, there are syringes specifically designed for this technique. They are of two types—one of them is gun like and the other pen type.



Intrapulpal Injection

It involves anesthetizing the pulp tissues directly by depositing the solution into the pulp. It may be painful initially but the onset of action is almost immediate. It is indicated when additional pulpal anesthesia is required as during pulpectomy or root canal treatment.



Differences between a Child and Adult Patient

1. The bone in the maxilla and mandible of the adult is heavier and more compact, whereas in the child it is varyingly less dense and incompletely calcified. So diffusion of the LA agent through the layers of the bone is faster in children.
2. The anatomic structures of the child are naturally smaller than those of the adult, so the depth of penetration of the needle should be less in children.
3. Penetrating too deeply at the area of the tuberosity can produce a hematoma that the pterygoid venus plexus or posterior superior alveolar artery be injured.
4. The depth of the needle penetration must be reduced because the ramus of the mandible is shorter vertically and narrower anteroposteriorly.
5. With an adult, the emotional aspect of the local anesthetic process is seldom a factor. For the child, however, the procedure is very much an emotional issue.

Complications Following Local Anesthetic Administration

1. *Due to the solution:* Toxicity, idiosyncrasy, allergy, anaphylactic reaction, infection, local irritation.

ANESTHETIC TOXICITY

Systemic toxic reactions from the anesthetics are rarely observed in adults. However, young children are more likely to experience toxic reactions because of their lower body weight. Young children are also often sedated with pharmacologic agents before the treatment. The

potential for toxic reactions increases when local anesthetics are used in conjunction with sedation medications.

For example, the toxic dose of lidocaine would be attained if hardly more than P/2 cartridges (3 ml) of 2% lidocaine with 1:100,000 epinephrine were injected at one time in a patient weighing 14 kg (30 lb). Yet 5 1/2 cartridges of the same anesthetic agent would be required to reach the toxic level in an adolescent patient weighing 46 kg (100 lb).

2. *Due to the needle:* Trismus, syncope, edema, broken needle, infection, hematoma, sloughing, and bizarre neurological symptoms.

3. *Self-inflicted injury:* The numb feeling that is produced may cause postoperative complications such as lip, tongue or cheek biting leading to severe soreness and ulcerations. Parents of children who receive regional local anesthesia in the dental office should be warned that the soft tissue in the area will be without sensation for a period of 1 hour or more. These children should be observed carefully so that they will not purposely or inadvertently bite the tissue.

Complications after a self-inflicted injury of this type are rare. However, the child should be seen in 24 hours, and a warm saline mouth rinse is helpful in keeping the area clean.



REVERSAL OF DENTAL ANESTHESIA

(phentolamine mesylate) became the first pharmaceutical agent indicated for the reversal of soft-tissue anesthesia—that is, anesthesia of the lip and tongue, and the associated functional deficits resulting from an intraoral submucosal injection of a local anesthetic containing a vasoconstrictor. The most common adverse reaction was transient injection site pain. Although tachycardia and cardiac arrhythmia may occur with the parenteral use of alpha-adrenergic blocking agents, such events are uncommon after the submucosal administration of OraVerse. Currently, OraVerse is not recommended for use in children younger than 6 years of age or in those who weigh less than 15 kg (33 lb).