**Techniques related to maxilla**

Numerous injection techniques are available to provide clinically adequate anesthesia of the teeth and soft and hard tissues in the maxilla.

* Some of the techniques related to maxilla:
* Supraperiosteal (infiltration), recommended for limited treatment protocols.
* Periodontal ligament (PDL; intraligamentary) injection, recommended as an adjunct to other techniques or for limited treatment protocols.
* Intraosseous injection, recommended for single teeth (primarily mandibular molars) when other techniques have failed.
* Posterior superior alveolar (PSA) nerve block, recommended for management of several molar teeth in one quadrant.
* Greater (anterior) palatine nerve block, recommended for palatal soft and osseous tissue treatment distal to the canine in one quadrant.
* Nasopalatine nerve block, recommended for palatal soft and osseous tissue management from canine to canine bilaterally.
* Infraorbital nerve block: for managing teeth from central incisor to second premolar hard and soft tissue except palatals tissue.
* **Supraperiosteal Injection:**

It is the most frequently used technique for obtaining pulpal anesthesia in maxillary teeth. Although it is a simple procedure with a high success rate. Areas Anesthetized is the entire region innervated by the large terminal branches of this plexus: pulp and root area of the tooth, buccal periosteum, connective tissue, and mucous membrane.

**Indications**

1. Pulpal anesthesia of the maxillary teeth when treatment is limited to one or two teeth.

2. Soft tissue anesthesia when indicated for surgical procedures in a circumscribed area.

**Contraindications**

1. Infection or acute inflammation in the area of injection.

 2. Dense bone covering the apices of teeth (Lower posterior teeth).

**Alternatives** PDL injection, intraosseous injection, regional nerve block.

**Landmarks**:

1. Mucobuccal fold.
2. Crown of the tooth.
3. Root contour of the tooth

**Posterior Superior Alveolar Nerve Block**

When used to achieve pulpal anesthesia, the PSA nerve block is effective for the maxillary third, second, and first molars (first molar in 77% to 100% of patients). However, the mesiobuccal root of the maxillary first molar is not consistently innervated by the PSA nerve.

**Indications**

1. When treatment involves two or more maxillary molars

2. When supraperiosteal injection is contraindicated (e.g., with infection or acute inflammation)

 3. When supraperiosteal injection has proved ineffective

**Contraindication**

When the risk of hemorrhage is too great (as with a hemophiliac; patients taking drugs that can increase bleeding such as coumadin or clopidogrel (Plavix)), in which case a supraperiosteal or PDL injection is recommended.

**Alternatives**

1. Supraperiosteal or PDL injections for pulpal and root anesthesia.
2. Infiltrations for the buccal periodontium and hard tissues 3. Maxillary nerve block.

**Landmarks**:

* 1. Mucobuccal fold.
	2. Maxillary tuberosity.
	3. Zygomatic process of the maxilla

**Anterior Superior Alveolar Nerve Block (Infraorbital Nerve Block):**

The ASA nerve block does not enjoy the popularity of the PSA nerve block, primarily because there is a general lack of experience with this highly successful and extremely safe technique. It provides profound pulpal and buccal soft tissue anesthesia from the maxillary central incisor through the premolars. It could be done intra or extra orally.

**Indications**

1. Dental procedures involving more than two maxillary anterior teeth (incisors through premolars) and their overlying buccal tissues.

2. Inflammation or infection (which contraindicates supraperiosteal injection): If a cellulitis is present, the maxillary nerve block may be indicated in lieu of the ASA nerve block.

3. When supraperiosteal injections have been ineffective because of dense cortical bone.

**Contraindications**

1. Discrete treatment areas (one or two teeth only; supraperiosteal injection preferred).

2. Hemostasis of localized areas, when desirable, cannot be adequately achieved with this injection; local infiltration into the treatment area is indicated.

**Alternatives**

1. Supraperiosteal, PDL, or intraosseous injection for each tooth

2. Infiltration for the periodontium and hard tissues 3. Maxillary nerve block

**Landmarks** related to intra oral approach:

1. Mucobuccal fold.
2. Infraorbital notch.
3. Intraorbital foramen.

**Landmark for extraoral approach**: the approximate location of infraorbital foramen.

**Palatal Anesthesia**

Anesthesia of the hard palate is necessary for dental procedures involving manipulation of palatal soft or hard tissue. Indeed, many dentists advise their patients that they expect them to feel pain (dental professionals usually use the term discomfort rather than pain when describing painful procedures).

In order to achieve atraumatic palatal anesthesia follow instructions:

1. Provide adequate topical anesthesia at the site of needle penetration.

2. Use pressure anesthesia at the site both before and during needle insertion and the deposition of solution.

3. Maintain control over the needle.

4. Deposit the anesthetic solution slowly. 5. Trust in yourself…that you can complete the procedure atraumatically.

 Three most common palatal anesthesia the anterior (or greater) palatine nerve block, providing anesthesia of the posterior portions of the hard palate; the nasopalatine nerve block, producing anesthesia of the anterior hard palate; and local infiltration of the hard palate—are used primarily to achieve soft tissue anesthesia and hemostasis before surgical procedure.

**Greater Palatine Nerve Block**

The greater palatine nerve block is useful for dental procedures involving the palatal soft tissues distal to the canine. the greater palatine nerve block is less so than the nasopalatine nerve block because tissues surrounding the greater palatine foramen are not as firmly adherent to bone and therefore are better able to accommodate the recommended volume of anesthetic solution.

**Indications**

1. When palatal soft tissue anesthesia is necessary for restorative therapy on more than two teeth (e.g., with subgingival restorations, with insertion of matrix bands subgingivally)

2. For pain control during periodontal or oral surgical procedures involving the palatal soft and hard tissues

**Contraindications**

1. Inflammation or infection at the injection site

2. Smaller areas of therapy (one or two teeth)

**Alternatives**

1. Local infiltration into specific regions

2. Maxillary nerve block

**Landmarks**: greater palatine foramen and junction of the maxillary alveolar process and palatine bone.

Nasopalatine Nerve Block

Nasopalatine nerve block is an invaluable technique for palatal pain control in that, with administration of a minimum volume of anesthetic solution (maximally one-quarter of a cartridge), a wide area of palatal soft tissue anesthesia is achieved, thereby minimizing the need for multiple palatal injections.

Unfortunately, the nasopalatine nerve block has the distinction of being a potentially highly traumatic (e.g., painful) injection.

It could be achieved with single penetration which has the advantage of single injection but traumatic one. The second is the three-injection technique In it, the labial soft tissues between maxillary central incisors are anesthetized (injection 1), and then the needle is directed from the labial aspect through the interproximal papilla between the central incisors toward the incisive papilla on the palate to anesthetize the superficial tissues in this area (injection 2). A third injection, directly into the now partially anesthetized palatal soft tissues overlying the nasopalatine nerve.

**Indications**

1. When palatal soft tissue anesthesia is necessary for restorative treatment on more than two teeth (e.g., subgingival restorations, insertion of matrix bands subgingivally)

2. For pain control during periodontal or oral surgical procedures involving palatal soft and hard tissues

**Contraindications**

1. Inflammation or infection at the injection site.

2. Smaller area of therapy (one or two teeth).

**Alternatives**

1. Local infiltration into specific regions

2. Maxillary nerve block (unilateral only)

3. AMSA nerve block (unilateral only)

4. Intranasal local anesthetic mist

**Landmarks**: central incisors and incisive papilla.

Local Infiltration of the Palate

**Indications**

1. Primarily to achieve hemostasis during surgical procedures

2. Palatogingival pain control when limited areas of anesthesia are necessary for application of a rubber dam clamp, packing of retraction cord in the gingival sulcus, or operative procedures on not more than two teeth.

**Contraindications**

1. Inflammation or infection at the injection site

2. Pain control in soft tissue areas involving more than two teeth

**Alternatives**

1. For hemostasis: none

 2. For pain control: nasopalatine or greater palatine nerve block, AMSA nerve block, maxillary nerve block.

Landmark: gingival tissue in the estimated center of the treatment area.