

TECHNIQUES OF LOCAL ANESTHESIA

There are no techniques of local anesthetic administration that are unique to children; however, modifications to standard methods are sometimes required. As far as positioning the child is concerned, the upper body should be around 30° to the vertical. Sitting upright can increase the chances of fainting, whilst at the other extreme (fully supine) the child may feel ill at ease. When there is a choice of sites at which to administer the first local anesthetic injection, the primary maxillary molar area should be chosen. This is the region that is most easily anesthetized with the least discomfort.

MAXILLARY INJECTION TECHNIQUES

Posterior Superior Alveolar Nerve Block

- Nerves anesthetized: Posterior superior alveolar nerve.
- Areas anesthetized: Maxillary permanent molars with the exception of mesiobuccal root of 1st molar, buccal alveolar processes of the maxillary molars, periosteum, connective tissue and mucous membrane.
- Indications: Operative procedures of molar teeth and supporting structures. This injection must be combined with other injections for extractions and instrumentation.

Middle Superior Alveolar Nerve Block

- Nerves anesthetized: middle superior alveolar nerves
- Areas anesthetized: bicuspid and mesiobuccal root of the 1st molar on the side injected, including bone and soft tissue.

Anterior Superior Alveolar Nerve Block

- Nerves anesthetized: anterior superior alveolar nerve.
- Areas anesthetized: Incisors, cuspids, on the side injected, including bone and soft tissue, upper lip and a portion of nose on the same side.
- Infiltration in the apical region of the anterior teeth provide satisfactory anesthesia in most cases

Infraorbital Nerve Block

- Nerves anesthetized: Infraorbital, inferior palpebral, lateral nasal and superior labial nerves.
- Areas anesthetized: incisors, cuspid and bicuspid teeth, upper lip, a portion of nose and the lower eyelid, on the same side.
- The infraorbital foramen in a 3 year old is about 5 mm above the vestibular depth.

Indications: Wound closure, Pain relief, Anesthesia for debridement

Nasopalatine Nerve Block

- Nerves anesthetized: Nasopalatine nerve as it emerges from the anterior palatine foramen
- Areas anesthetized: Anterior portion of the hard palate and overlying structures back to the bicuspid
- Indications
 - For palatal anesthesia
 - To supplement the block of anterior superior alveolar nerve.
 - To complete anesthesia of nasal septum.

About 0.2-0.3 ml of local anesthetic solution is administered at the entrance of the incisive foramen on the incisive papilla.

Greater Palatine Nerve Block

- Nerves anesthetized: Anterior palatine as it leaves the greater palatine foramen.
- Areas anesthetized: Maxillary posterior teeth in the palatal aspect, posterior portion of the hard palate and overlying structures up to the first bicuspid area on the side injection.
- Indications
 - For palatal anesthesia to be used in conjunction with posterior superior alveolar nerve block or middle superior alveolar nerve block.
 - For surgery of posterior portion of hard palate.

It is anesthetized at the region midway between the midline of the hard palate and the palatal surface the posterior teeth.

Maxillary Nerve Block

- Nerves anesthetized: Entire maxillary nerve and all its subdivisions peripheral to the site of injection
- Areas anesthetized
 - Maxillary teeth on the affected side
 - Alveolar bone and overlying structures
 - Hard palate and portions of soft palate
 - Upper lip, cheek, side of nose and lower eyelid.
- Indications
 - When anesthesia of entire distribution of maxillary nerve is required for extensive surgery.
 - Local injection makes blocks of terminal branches unfeasible.
 - For diagnostic or therapeutic purposes such as tics or neuralgias of the maxillary division of the fifth nerve.

Infiltration Anesthesia

It is the method of choice in the maxilla. The infiltration of 0.5-1.0 ml of local anesthetic is sufficient for pulpal anesthesia of most teeth in children. The objective is to deposit local anesthetic solution as close as possible to the apex of the tooth of interest; however, the presence of bone prevents direct apposition. As the apices of most teeth are closer to the buccal side, a buccal approach is employed and the needle is directed towards the apex after insertion through reflected mucosa. Direct deposition under the periosteum can be painful; therefore a compromise is made and the solution is delivered supra-periosteally. The one area where pulpal anesthesia can prove troublesome in the child's maxilla is the upper first permanent molar region where the proximity of the zygomatic buttress can inhibit the spread of solution to the apical area.

MANDIBULAR INJECTION TECHNIQUES

Inferior alveolar and lingual nerve blocks

- Nerves anesthetized: Inferior alveolar nerve, mental nerve, incisive nerve, lingual nerve.
- Areas anesthetized: Mandibular teeth to midline, body of mandible, inferior portion of ramus, mucous membrane, buccal periosteum anterior to 1st molar (mental nerve), anterior 2/3 of tongue, floor of mouth, lingual soft tissues and periosteum

Indications

- Operative dentistry in all mandibular teeth
- Surgical procedures on mandibular teeth and supporting structures anterior to 1st primary molar when supplemented by lingual nerve anesthesia
- When supplemented by long buccal and lingual nerve surgical procedures on mandibular teeth posterior to 1st bicuspid
- Diagnostic and therapeutic purposes

Technique

- The anterior border of the ramus is palpated with finger or thumb resting in its greater curvature.
- It should be observed that as the internal pterygoid ligament passes inferiorly and laterally to attach at the base of the mandible, a triangle is formed by the anterior border of the ramus, the internal pterygoid muscle and the vault of the palate. The apex of the triangle is placed inferiorly. An imaginary longitudinal line dividing the tip of finger or thumb as it rests in the coronoid notch passes medially over a depressed area just above the apex.

- The anesthetic syringe is introduced into the oral cavity parallel with the occlusal plane of the mandibular posterior teeth.
- The needle depth is 8-10 mm from the mucosal surface. The amount deposited is 0.9-1.0 ml.
- Lingual nerve is anterior and medial to inferior alveolar nerve, so the needle has to be withdrawn and solution deposited half the distance from inferior alveolar foramen—deposited 0.5 ml.
- Buccal nerve can be anesthetized by infiltration in the buccal sulcus distal to the permanent teeth — 0.2 ml.

In children mandibular foramen is situated at a level lower than the occlusal plane of primary teeth. So injection is made at a lower level and posteriorly.

Mental nerve block

- Nerves anesthetized: Mental nerve
- Area anesthetized: Soft tissues of lower lip, chin, buccal soft tissues and to a lesser extent teeth anterior to mental foramen.

Mental nerve block is readily administered in children as the orientation of the mental foramen is such that it faces forward rather than posteriorly as in adults. Thus it is easier for solution to diffuse through the foramen when approached from an anterior direction. The needle is advanced in the buccal sulcus and directed towards the region between the first and second primary molar apices. Blockade of transmission in the mental nerve provides excellent soft tissue anesthesia. The efficacy is not as good in the anterior teeth compared with the premolars following mental and incisive nerve block.

The pulps of the lower incisor teeth may not be satisfactorily anesthetized by inferior alveolar nerve or mental nerve block injections because of cross-over supply from the contralateral inferior alveolar nerve. A buccal infiltration adjacent to the tooth of interest is sufficient to deal with this supply.

Long buccal

The long buccal injection usually equates to a buccal infiltration in children.

Infiltration Anesthesia

The use of buccal infiltration anesthesia in the mandible may produce pulpal anesthesia of the primary teeth. However, it may be unreliable especially when operating on the permanent dentition, with the exception of the lower incisor teeth. An alternative form of anesthesia in the posterior mandible is inferior alveolar nerve block anesthesia.