Welcome to the Greater New York Dental Meeting

Great New York Dental Meeting™
Executive Headquarters
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Sponsored by New York County & Second District Dental Societies

All programs and exhibits are held at the Jacob K. Javits Convention Center (unless otherwise indicated)
11th Avenue between 34th and 39th Street, New York City

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COURSE REGISTRATION
Pre-registration is required for all continuing education courses with the exception of the “Live” Dentistry and Affiliated Groups. Your seat will be held for 15 minutes after the start of the course; after that, those without tickets will be seated according to space availability. When the room is filled, no additional people will be admitted due to fire department regulations. If you have not pre-registered, please be prepared to select an alternate session to attend.

Tickets
Tickets are required for all courses excluding Live Dentistry. Tickets for all functions can be purchased at all general registration booths located in the Registration Area on the Upper Level in the Crystal Palace and online.

6 Days of Education Seminars, Hands-on Workshops & Essays
Friday - Wednesday
4 Days of Exhibits
Sunday - Wednesday

FREE “Live” Dentistry
Hi-Tech 450 Seat Arena

Celebrity Luncheon Speaker
John Quiñones
Monday, December 2nd
12:00 - 2:00 - Ticket 4010
$125.00

World Implant Expo

5th Annual Global Orthodontic Conference

3rd Annual Pediatric Dentistry Summit

12th Annual INVISALIGN® - GNYDM EXPO
4 Days of Programming: Sunday - Wednesday
Botox and Facial Fillers Seminar & Workshop
Over 1,700 Exhibit Booths
ARE YOU NUMB YET?
LOCAL ANESTHESIA TECHNIQUE

DECEMBER 3, 2019

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Reasons for Anesthetic Failures

1. Anatomical / physiological variations
2. Technical errors of administration
3. Patient anxiety
4. Inflammation and infection
5. Denatured/expired solutions


The Masticator Space
includes the Temporal & Infratemporal Fossae

The Muscles of Mastication
Four total: 2 superficial
1. Temporalis

Infratemporal Fossa

Contents
- Muscles of mastication
- Mandibular division of Trigeminal nerve, V₃
- Chorda tympani branch of Facial nerve, VII
- Maxillary artery and vein

The Muscles of Mastication
Four total: 2 superficial
1. Temporalis
2. Masseter

Liebgott, The Anatomical Basis of Dentistry, 2nd Ed, Mosby, 2001
Agur & Lee, Grant's Atlas of Anatomy, 10th Ed, Lippincott Williams & Wilkins, 1999

Age & Lee, Grant's Atlas of Anatomy, 10th Ed, Lippincott Williams & Wilkins, 1999

Age & Lee, Grant's Atlas of Anatomy, 10th Ed, Lippincott Williams & Wilkins, 1999
The Muscles of Mastication
Four total: 2 superficial; 2 deep

1. Temporalis
2. Masseter
3. Medial pterygoid

4. Lateral pterygoid

---

V₃: Sensory & Motor Innervation
Motor to the Muscles of Mastication
Sensory to all teeth and oral tissues
Enters through the Foramen Ovale

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V₃: Short stem, then splits into 2 divisions
Stem:
1. Medial pterygoid nerve
2. Tensor tympani nerve
3. Tensor palatini nerve
4. Meningeal branch

---

V₃: Anterior Division
Motor branches:
1. Deep temporal nerves (2)
2. Masseteric nerve
3. Lateral pterygoid nerve

One sensory branch:
Long Buccal nerve

---

V₃: Posterior Division
Sensory branches:
1. Auriculotemporal nerve
2. Lingual nerve
3. Inferior alveolar nerve
   - mylohyoid
   - mental
   - incisive

All sensory except Mylohyoid nerve
**V₃: Posterior Division**

Sensory branches:
1. Auriculotemporal nerve
2. Lingual nerve
3. Inferior alveolar nerve
   - mylohyoid
   - mental
   - incisive

All sensory except Mylohyoid nerve

---

**Blood Supply to the Infratemporal Fossa**

Maxillary artery: 3 parts
1. Mandibular
2. Pterygoid
3. Pterygopalatine

---

**Blood Supply to the Infratemporal Fossa**

Maxillary artery
Part 1: Mandibular
1. Deep auricular
2. Anterior tympanic
3. Middle meningeal
4. Accessory middle meningeal
5. Inferior alveolar
   - mylohyoid, mental, & incisive branches

---

**Blood Supply to the Infratemporal Fossa**

Maxillary artery
Part 2: Pterygoid
1. Deep temporal (2)
2. Medial pterygoid
3. Lateral pterygoid
4. Masseteric
5. Buccal
6. Lingual

---

**Blood Supply to the Infratemporal Fossa**

Maxillary artery
Part 3: Pterygopalatine
1. Posterior superior alveolar
2. Infraorbital
3. Artery of pterygoid canal
4. Pharyngeal branch
5. Descending palatine
6. Sphenopalatine

---

**Pterygoid Venous Plexus**

Primary drainage to Maxillary vein
Mandibular Infiltration Anesthesia

- Works well for the maxilla, but for the mandible...
- Works fairly well for anterior and bicuspids
- More variable predictability for molars
- Greater success using articaine & faster onset
- Lidocaine 45 – 67%; articaine 75 – 92%
- Lidocaine 6.1 – 11.1 minutes; articaine 4.2 – 4.7 minutes

Pharmacology of Anesthetic Agents

- A Practical Armamentarium:
  - From a meta-analysis of 13 clinical trials:
    - Evidence strongly supported articaine's superiority over lidocaine for infiltration anesthesia
    - Evidence was weak for any significant difference between lidocaine and articaine for block anesthesia
  - Articaine was 4 times more effective, with greater duration, than lidocaine as an infiltration injection when used for teeth diagnosed with irreversible pulps

In children: Infiltration of articaine provided profound anesthesia equivalent to an inferior alveolar plus long buccal nerve block with lidocaine.

Articaine was a times more effective, with greater duration, than lidocaine as an infiltration injection when used for teeth diagnosed with irreversible pulps.
Mandibular Anesthesia

- Inferior alveolar nerve block
- Intraoral landmarks:
  1. Coronoid notch
  2. Internal oblique ridge
  3. Pterygomandibular raphe

Evers & Haegerstam, Introduction to Dental Local Anaesthesia, Mediglobe, 1990

Mandibular Anesthesia

- Inferior alveolar nerve block
- Intraoral landmarks:
  3. Pterygomandibular raphe


Mandibular Anesthesia

- Inferior alveolar nerve block
- Bisection technique:
  - Depth: 25–30 mm
  - Needle: Long (short OK in children)
  - Amount: 2/3-3/4 cartridge
  - Comfort level: Moderate

After injection, sit patient up? Not necessary: gravity is not a factor

Evers & Haegerstam, Introduction to Dental Local Anaesthesia, Mediglobe, 1990

Mandibular Anesthesia

- Inferior alveolar nerve block
- Important for success: No “Chin on the Chest” syndrome

Image courtesy of Dr. Mel Hawkins

Mandibular Anesthesia

- Inferior alveolar nerve block
- My concerns
  1. Highly variable success rate
  2. Potential for intravascular injection
  3. Potential injury: nerve, vasculature


Mandibular Anesthesia
- Inferior alveolar nerve block
  - Bisection technique:
    - Unfortunately, most of the mandibular anatomy varies widely
    - Wide flaring ramus
    - Bulky muscles or buccal fat pad
    - Class II occlusion
    - Missing molars/edentulous
    - Age/children
    - Except one feature, not so much

Meechan, Practical Dental Local Anesthesia, Quintessence, 2002

Prado FB et al, Morphological changes in the position of the mandibular foramen in dentate and edentate Brazilian subjects, Clinical Anatomy, Vol 23, 2010

Mandibular Anesthesia
- Inferior alveolar nerve block
  - Alternative technique: IA "Walk-In" technique
  1. Deliberately contact bone anterior to mandibular foramen, feel depth

Meechan, Practical Dental Local Anesthesia, Quintessence, 2002

Mandibular Anesthesia
- Inferior alveolar nerve block
  - IA "Walk-In" technique
  1. Penetrate tissue, then put posterior pressure on the syringe to produce strong needle deflection
  2. Deliberately contact bone anterior to mandibular foramen, feel depth
  3. Withdraw 2 – 3 mm, pivot from tip of the needle to the ipsilateral side
  4. Insert 2 – 3 mm posteriorly, pivot back to contralateral side, contact bone again, feel depth
  5. Repeat 1 – 2 times

When you reach the same injection depth without contacting bone, Stop Aspirate Inject

Meechan, Practical Dental Local Anesthesia, Quintessence, 2002

Mandibular Anesthesia
- Inferior alveolar nerve block
  - Indirect IA technique: bisection technique = Direct technique
  1. Contact bone anterior to mandibular foramen
  2. Redirect to medial
  3. "Hook" around lingula, insert slightly
  4. Stop Aspirate Inject

Meechan, Practical Dental Local Anesthesia, Quintessence, 2002

Mandibular Anesthesia
- Inferior alveolar nerve block
  - My concerns
  1. This is NOT a complete mandibular division nerve block!
  2. Lingual nerve block given in combination with IA
  3. No long buccal nerve blockade
  4. Requires separate injection
  5. Common accessory innervation to molars

Meechan, Practical Dental Local Anesthesia, Quintessence, 2002
Mandibular Anesthesia

- Lower lip and chin is numb
- Tongue is numb
- But the molar tooth is only partially numb!
- Give the long buccal regional nerve block

The long buccal injection should be given to complement the IA & lingual regional blocks.

Troubleshooting Mandibular Anesthesia

- The tooth is only partially numb!
- Or the tooth is numb, but duration is short and/or anesthesia is not profound
- Go higher and deeper for a second injection?
- Risk higher incidence of positive aspiration

- You’ve given the IA and lingual regional blocks, and the long buccal regional block
- But the tooth is still only partially numb!

Solutions

- For one tooth, buccal & lingual infiltrations, PDL, or intraosseous injections work well
- For a quadrant, a mylohyoid nerve block may be best
Mandibular Anesthesia

- Mylohyoid regional nerve block
- Accessory innervation to any mandibular tooth

53% of mandibles had accessory foramina near the mylohyoid line, particularly in the premolar area.*


Katakami K et al, Characteristics of accessory mental foramina on limited cone-beam computed tomography images, J Endod, 34(12), 2008

In cadaver dissections, 56% exhibited branches of the mylohyoid nerve entering foramina in the lingual surface of the mandible. These nerves ended directly in mandibular teeth or joined the incisive branch of the inferior alveolar nerve.


The point at which the mylohyoid nerve branched from the inferior alveolar nerve ranged from 5 to 23 mm above the mandibular foramen, with a mean distance of 14.7 mm.*


Mandibular Anesthesia

- Mylohyoid nerve block
- Between mandible and sublingual fold
- Just distal to last tooth to be worked on
- Approximate apices of roots
- Easiest for anterior teeth
- Access to molars may be difficult

It's a lingual infiltration injection!

Evers & Haegerstam, Introduction to Dental Local Anaesthesia, Mediglobe, 1990

Mandibular Anesthesia

- Mandible: Regional blocks
- Inferior alveolar nerve block
- Lingual nerve block
- Long buccal nerve block
- Mental (incisive) nerve block
- Mylohyoid nerve block
- Complete mandibular division nerve blocks
- Gow-Gates
- Vazirani – Akinosi

Mandibular Anesthesia

- Gow-Gates complete mandibular division block

Meechan, Practical Dental Local Anesthesia, Quintessence, 2002

Mandibular Anesthesia

- Mandible: Nerve blocks
- Inferior alveolar regional "mandibular" block

Agur & Lee, Grant's Atlas of Anatomy, 10th Ed, Williams & Wilkins, 1999

Mandibular Anesthesia

- Mylohyoid regional nerve block
- Accessory innervation to any mandibular tooth

The point at which the mylohyoid nerve branched from the inferior alveolar nerve ranged from 5 to 23 mm above the mandibular foramen, with a mean distance of 14.7 mm.*


Mandibular Anesthesia

- Mylohyoid nerve block
- Depth 2 – 4 mm
- Needle Short
- Amount 1/3 – 1/2 cartridge
- Comfort Level High

Good for any mandibular tooth
Mandibular Anesthesia

- Gow-Gates mandibular division block
  - Landmarks
    1. Alpha plane: from intertragic notch of the ear to corner of the mouth, and across to the opposite corner of the mouth
      Anterior – posterior orientation

- Target: Contact bone at the neck of the condyle

For 1 – 1.5 minutes after deposition of the anesthetic

- Angle (medial – lateral angulation) = Beta plane
  - Varies with width and flare of mandible and ramus
  - Aim for your extraoral finger behind

- Extraoral finger behind the neck of the condyle
  - About 10 – 15° upward angle from the maxillary occlusal plane

Depth 25 – 28 mm (contact bone)
Needle Long
Amount 1 – 2 cartridges (⅔ - ⅓ for child)
Comfort level Moderate to high
Keep mouth open for 1 to 1.5 minutes after deposition of the anesthetic

Malamed, Handbook of Local Anesthesia, 5th Ed., Elsevier Mosby, 2004
Agur & Lee, Grant’s Atlas of Anatomy, 10th Ed, Williams & Wilkins, 1999
Meechan, Practical Dental Local Anesthesia, Quintessence, 2002
Mandibular Anesthesia

- Complete mandibular division nerve block
- Vazirani – Akinosi mandibular division block
  - A closed mouth technique

Vazirani – Akinosi

- Complete mandibular division nerve block
- A closed mouth technique delivered at a higher level than the conventional IA block
  - 10 – 14 mm higher

Mandibular Anesthesia

- Vazirani – Akinosi mandibular division block
  - A closed mouth technique
    - Depth: 25 – 30 mm (no bone contact)
    - Needle: Long
    - Amount: 1 – 2 cartridges (2/3 – 1 1/3 for child)
    - Comfort level: Moderate

Vazirani – Akinosi Quadrant Block

Have the patient slide their lower jaw towards the injection side

Injection site visibility difficult with mouth closed
Mandibular Anesthesia

- Vazirani – Akinosi mandibular division block
  - Modifications
    1. Mouth slightly open
    2. Use bent needle
  - Area of anesthesia

- Success rate of techniques
  - Conventional*: 65 – 86%
  - Gow-Gates*: 90 – 100%
  - Vazirani – Akinosi*: 76 – 93%
  - * Using 1 – 2 cartridges (½ - 1⅔ for child) to flood masticator space

- Area of anesthesia

- Onset of Anesthesia
  - At 5 min.
    - Conventional: 72 – 85%
    - Gow-Gates: 45%
    - Vazirani – Akinosi: 90%
  - At 10 min.
    - Conventional: 79 – 90%
    - Gow-Gates: 90%
    - Vazirani – Akinosi: 90%

- Incidence of Positive Aspiration
  - Conventional: 3.6 – 22%
  - Gow-Gates: 0 – 2%
  - Vazirani – Akinosi: 2%

- Incidence of Other Undesirable Side Effects
  1. Hitting a nerve
  2. Piercing a muscle
  3. Injecting the parotid gland
    - Most common with IA block

- Incidence of Other Undesirable Side Effects
  2. Piercing a muscle = Trismus
  - Possible causes include insertion of the needle into a muscle, bleeding into a muscle, or injection of anesthetic into a muscle
  - All of these may produce muscle spasms
  - Result is limited ability to open and possible pain on opening
Mandibular Anesthesia

- Incidence of Other Undesirable Side Effects
  1. Hitting a nerve
  2. Piercing a muscle
  3. Injecting the parotid gland
     - Most common with IA block
  4. Anesthesia in the opposite arch
  5. Other unusual events
     - Most common with Vazirani – Akinosi block

- Comparison of mandibular division nerve block techniques
  - Conventional (Halstead) regional technique
    - Advantages:
      - Most familiar and most widely used
      - Good success rate (65 – 86%+)
    - Disadvantages:
      - Higher success rates associated with increased incidence of positive aspiration
      - Moderate incidence of trismus and/or paresthesia
      - Multiple injections required for anesthesia of inferior alveolar, lingual, long buccal, and mylohyoid nerves
  - Gow-Gates technique
    - Advantages:
      - Very high success rate (90 – 100%)
      - Extremely low incidence of positive aspirations
      - Single injection for anesthesia of inferior alveolar, lingual, long buccal, and mylohyoid nerves
    - Disadvantages:
      - Technically a more difficult technique to master
      - Slower onset of anesthesia
      - Possible increased patient discomfort
  - Vazirani – Akinosi technique
    - Advantages:
      - Moderate to high success rate (76 – 93%)
      - Extremely low incidence of positive aspirations
      - Significantly reduced incidence of trismus and/or paresthesia
      - Potential single injection for anesthesia of inferior alveolar, lingual, long buccal, and mylohyoid nerves
      - Less threatening to apprehensive patients (closed mouth)
      - Ability to anesthetize both sensory and motor nerve branches uniquely useful for patients with severe trismus
Mandibular Anesthesia

- Comparison of mandibular division nerve block techniques
  - Vazirani – Akinosi technique

Disadvantages:
- Increased potential for operator error due to no bone contact
- Higher incidence of unexpected and unusual side effects
- Least reliable technique to achieve anesthesia of long buccal nerve

Mandibular Anesthesia

- The risk of nerve injury with administration of prilocaine (Citanest) or articaine (Septocaine) may be reduced by using “high” mandibular division block techniques
- Gow-Gates technique
- Vazirani – Akinosi technique

Troubleshooting Mandibular Anesthesia

- The “Hot” Tooth / “Hot” Gum
  - Includes:
    1. Infected teeth with irreversible pulpitis
    2. Severe periodontal infections
    3. Hypoplastic teeth with severe sensitivity
    4. Teeth with hypersensitivity due to recession, occlusal trauma/bruxing, etc.

  All of these may be highly problematic to anesthetize

Patients who took 800mg of ibuprofen 1 hour before IANB for endodontic treatment of mandibular posterior teeth with irreversible pulpitis were 2x more likely to have “little or no pain during endodontic treatment.”

Prevention of mandibular anesthesia complications with ibuprofen: randomized, placebo-controlled clinical trial.

Lapidus D et al, J Amer Dent Assoc 147(6), June 2016

Troubleshooting Mandibular Anesthesia

- The “Hot” Tooth / “Hot” Gum
  - First, give a block injection
    - Well away from the site of any local inflammation or infection
    - The low pH will prevent the dissociation of the anesthetic agent
    - A needle should not be inserted into an area of active infection, such as a periodontal or periapical abscess
    - The volume of anesthetic is likely to increase pain
    - There is the potential for spreading the infection


Troubleshooting Mandibular Anesthesia

- No technique was fully acceptable by itself

Aggarwal V et al, Comparative evaluation of anesthetic efficacy of Gow-Gates mandibular, Vazirani-Akinosi, buccal-lateral, and conventional inferior alveolar nerve block techniques in patients with or without premedication with ibuprofen and epinephrine.

Haas DA, Localized complications from local anesthesia, J Calif Dent Assoc, Vol 26 No 9, 1998
Troubleshooting Mandibular Anesthesia

- The “Hot” Tooth / “Hot” Gum
  - First, give a block injection
    - Well away from the site of any local inflammation or infection
  - Second, is topical/Oraqix around the tooth adequate?
  - If not, give a periodontal ligament (PDL) or intraosseous injection
    - Periodontal ligament injections are quick and easy to give, but offer only short duration
    - Intraosseous injections are more reliable and have better duration

Troubleshooting Mandibular Anesthesia

- The “Hot” Tooth / “Hot” Gum
  - First, give a block injection
  - Second, is topical/Oraqix around the tooth adequate?
  - If not, give a periodontal ligament (PDL) or intraosseous injection
  - Or, give a buccal &/or lingual infiltration with articaine (or prilocaine)

Troubleshooting Mandibular Anesthesia

- Innervation of mandibular teeth, particularly molars, from the cervical plexus
  - Great auricular nerve
  - Transverse cervical nerve

Troubleshooting Mandibular Anesthesia

- Is it possible that innervation to mandibular teeth, particularly molars, comes from the cervical plexus?
  - The great auricular nerve and/or the transverse cervical nerve reached the mandible in 60% of 250 cadavers
  - Anastomoses between the cervical plexus and trigeminal nerves were observed in 15% of 250 cadavers
  - With the auriculotemporal nerve was most common
  - With the mental nerve was less common
  - The likelihood of innervation from the cervical plexus reaching mandibular teeth is small, but can occur

Troubleshooting Mandibular Anesthesia

- Repeated failure to achieve adequate anesthesia
  - Take a panoramic radiograph
    - Incidence of bifid IA nerve: 4 patients in 5,000 films

Troubleshooting Mandibular Anesthesia

- With Cone Beam Computed Tomography (CBCT), the incidence of bifid mandibular canals/inferior alveolar nerves has been found to be at least 15.6%, and may be as high as 30%.
Mandibular Anesthesia
- Mental (& incisive) nerve block

For children, anesthetizes the five primary mandibular teeth in a quadrant

Mandibular Anesthesia
- Mental (& incisive) nerve block
- Depth: 3 – 6 mm
- Needle: Short
- Amount: 1/2 cartridge
- Comfort level: High

After injection, massage site

The Masticator Space/Infratemporal Fossa

Pterygopalatine fossa opens into the medial wall
- Boundaries:
  - A gap between the maxilla anteriorly and the lateral pterygoid plate of the sphenoid bone posteriorly
  - Laterally: an opening, the pterygomaxillary fissure, into the infratemporal fossa
  - Medially: the palatine bone & sphenopalatine foramen

Pterygopalatine Fossa
- Contents:
  - Maxillary division of Trigeminal nerve, V2
  - Pterygopalatine ganglion
  - Terminus of maxillary artery
  - Distributed out with the branches of V2

Maxillary Anesthesia
- Maxilla: Nerves
  - Infraorbital nerve
  - Anterior superior alveolar nerve
  - Middle superior alveolar nerve
  - Posterior superior alveolar nerve

Maxillary Anesthesia
- Maxilla: Nerves
  - Infraorbital nerve
  - Anterior superior alveolar nerve
  - Middle superior alveolar nerve
  - Posterior superior alveolar nerve
  - Nasopalatine nerve
  - Greater palatine nerve
  - Lesser palatine nerve
Maxillary Infiltration Anesthesia

- Buccal infiltrations work well for the maxilla of both adults and children.
- For children, buccal infiltrations work well for short procedures on primary teeth, except perhaps for pulpotomies and extractions.
- Lidocaine works well; ~\( \frac{1}{3} \) cartridge.
- Apices of primary teeth lie just beyond the depth of the mucobuccal fold; 2–3 mm of penetration is enough.

Mandibular Infiltration Anesthesia

- For the mandible...
- For children, buccal infiltrations work well for short procedures on primary teeth, except perhaps for pulpotomies and extractions.
- Lidocaine works well; ~\( \frac{1}{3} \) cartridge.
- Apices of primary teeth lie just beyond the depth of the mucobuccal fold; 2–3 mm of penetration is enough.
- However, more profound anesthesia of longer duration is obtained with an inferior alveolar nerve block.

Oulis CJ et al, The effectiveness of mandibular infiltration compared to mandibular block anesthesia in treating primary teeth in children, Pediat Dent, 1996

Maxillary Anesthesia

- Additional alternatives for the maxilla:
  - PDL injection
  - Intraosseous injection
  - Interdental injection
  - Intraseptal injection
  - Palatal sulcular injection
- For primary teeth when palatal anesthesia is needed in addition to buccal infiltration and interdental injections.

Maxillary Anesthesia

- Anterior & middle superior alveolar nerve block
- Infraorbital nerve block approach

Delivered at the infraorbital foramen
Palpate the inferior orbital rim
Drop 10 mm below lowest point

Maxillary Anesthesia

- Anterior & middle superior alveolar nerve block
- Infraorbital nerve block approach

<table>
<thead>
<tr>
<th>Depth</th>
<th>3–15 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Needle</td>
<td>Short</td>
</tr>
<tr>
<td>Amount</td>
<td>1/3</td>
</tr>
<tr>
<td>Comfort level</td>
<td>Moderate to high (technique dependent)</td>
</tr>
</tbody>
</table>
Maxillary Anesthesia

- Anterior & middle superior alveolar nerve block
  - Infraorbital approach
  - MSA absent in ~28% of patients

Meechan, Practical Dental Local Anesthesia, Quintessence, 2002

Evers & Haegerstam, Introduction to Dental Local Anaesthesia, Mediglobe, 1990

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Maxillary Anesthesia

- Maxilla: Nerve blocks
  - Anterior & middle superior alveolar nerve block
    - The AMSA palatal approach (P-AMSA injection)

Depth 2 – 4 mm
Needle Short
Amount ≤1/4 cartridge of articaine
Comfort level Moderate

Meechan, Practical Dental Local Anesthesia, Quintessence, 2002

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Maxillary Anesthesia

- Anterior & middle superior alveolar nerve blocks
  - The AMSA palatal approach vs. infraorbital approach

Advantages
1. Buccal and palatal anesthesia of bicuspids and incisors
2. No lip anesthesia
3. More reliable anesthesia of middle superior alveolar nerve/bicuspid

Disadvantages
1. Shorter duration
2. A palatal injection

---

Maxillary Anesthesia

- Techniques to minimize the discomfort of all injections
  1. Topical anesthesia
  2. Pressure distraction/analgesia
  3. Slow injection with small volumes
  4. Buccal infiltrations
  5. Explain all that you do to minimize the discomfort

Learn to give comfortable palatal injections!

---

Maxillary Anesthesia

- Maxilla: Regional blocks
  - The ASA palatal approach (P-ASA injection)
    - To bilaterally anesthetize:
      1. Incisor pulps
      2. Buccal tissue
      3. Anterior palatal tissue

---
Maxillary Anesthesia

- Bilateral anterior superior alveolar nerve block
  - The ASA palatal approach (P-ASA injection)
    1. Inject from side of incisive papilla initially, then gently shift to vertical orientation as enter incisive canal
    2. SLOWLY inject 1/4 – 1/3 cartridge of articaine

- Nasopalatine regional nerve block
  - The Three-Step technique
    1. Buccal infiltration over either central incisor
    2. Infiltrate central papilla
    3. Inject nasopalatine (incisive) papilla

- Posterior superior alveolar regional nerve block

Meechan, Practical Dental Local Anesthesia, Quintessence, 2002
Maxillary Anesthesia

- Posterior superior alveolar regional nerve block
  - Depth: 12 – 18 mm
  - Needle: Long
  - Amount: 3/4 cartridge
  - Comfort level: High
  - High risk of positive aspiration and hematoma

Maxillary Anesthesia

- Hematoma
  - A hematoma may form independently of aspiration results.
  - Aspiration results merely report the contents at the needle tip at the time of aspirating

Maxillary Anesthesia

- Equal maxillary division block
  - With 2 injections
  - With 1 cartridge
  - Two approaches
    - PSA (lateral) approach
    - Greater palatine canal approach

Aspiration During Injections

- Hematoma
  - The vessels most commonly associated with hematomas are
    1. Pterygoid venous plexus
    2. Posterior superior alveolar vessels
    3. Inferior alveolar vessels
    4. Mental vessels

Maxillary Anesthesia

- Greater palatine regional nerve block
  - Depth: 2 – 4 mm
  - Needle: Short
  - Amount: 1/4 – 1/3 cartridge
  - Comfort level: Moderate to high

Pterygopalatine Fossa

- Contents
  - Maxillary division of Trigeminal nerve, V2
  - Passes across the top of the fossa

Maxillary Anesthesia

- Maxilla: Nerve blocks
  - Complete maxillary division block
    - With 2 injections
    - With 1 cartridge
    - Two approaches
      - PSA (lateral) approach
      - Greater palatine canal approach

Liebgott, The Anatomical Basis of Dentistry, 2nd Ed, Mosby, 2001

Agur & Lee, Grant's Atlas of Anatomy, 10th Ed, Lippincott Williams & Wilkins, 1999


Maxillary Anesthesia
- Complete maxillary division block
  - PSA (lateral) approach
    - High risk of hematoma


PSA approach
- Greater palatine canal approach
  1. Give greater palatine block injection
  2. Re-palpate the greater palatine foramen
  3. With a single penetration, gently probe for the foramen

Fehrenbach & Herring, Illustrated Anatomy of the Head & Neck, Saunders, 1996

Maxillary Anesthesia
- Greater palatine canal approach
  1. With a single penetration, gently probe for the foramen
  2. Passively insert needle up canal
  3. Deposit the entire cartridge of anesthetic

Maxillary Anesthesia
- Complete maxillary division block
  - With either approach, may anesthetize zygomatic branch of V₂
    - Innervation to lacrimal (tear) gland

Liebgott, The Anatomical Basis of Dentistry, 2nd Ed, Mosby, 2001