GREATER NEW YORK DENTAL MEETING
95th ANNUAL SESSION

NOVEMBER 29 - DECEMBER 4, 2019

Effective and Predictable Local Anesthesia: Hands-on Workshop

Alan W. Budenz
Welcome to the Greater New York Dental Meeting

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

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

General Registration Hours
Friday, November 29 12:00 Noon - 4:30 P.M.
Saturday, November 30 8:00 A.M. - 4:30 P.M.
Sunday, December 1 - Tuesday, December 3 8:00 A.M. - 5:30 P.M.
Wednesday, December 4 8:00 A.M. - 4:30 P.M.

Exhibit Hall Hours
Sunday, December 1 - Tuesday, December 3 9:30 A.M. - 5:30 P.M.
Wednesday, December 4 9:30 A.M. - 5:00 P.M.

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

SUNDAY
9:45 - 11:45
VOCO America, Inc.
Drs. Ron Kaminer & Marc Geissberger
Restorative

12:00 - 2:00
First Fit
Drs. Frederick E. Solomon
Cyrus Tahmasebi
Digital

3:30 - 5:15
Align I Invisalign I Itero
Drs. Karla Soto &
Christian Coachman
Restorative

MONDAY
9:45 - 11:45
Shofu
Dr. Ron Kaminer
Restorative

12:00 - 2:00
Gestalt
Dr. Justin Chi
Digital

3:00 - 5:15
Glidewell
Dr. Jennifer S. Smiley
Digital

TUESDAY
9:45 - 12:00
Millennium
Dr. Sunil D. Thakur
Laser

2:00 - 4:15
Dentsply
Dr. Christian Coachman
Digital

WEDNESDAY
9:45 - 12:00
Apa / CareCredit
Drs. Michael Apa
Aesthetic

2:00 - 4:15
Benco / Vatech
Dr. Aekkavya Panjali
Implant

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

Dental Laboratory
Technicians Programs

3D Printing & Digital Dentistry Conference

Sleep Apnea Symposium
Oral Cancer Symposium

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EFFECTIVE AND PREDICTABLE LOCAL ANESTHESIA: A HANDS-ON WORKSHOP
DECEMBER 2, 2019

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Reasons for Anesthetic Failures

1. Anatomical/physiological variations
   - Wide flaring mandible
   - Wide flaring ramus
   - Long (A - P) ramus
   - Bulky musculature
   - Large buccal fat pad
   - Class III occlusion
   - Missing teeth
   - Children
   - Accessory or anomalous nerve pathways

2. Technical errors of administration
   - Too high
   - Too low
   - Too anterior
   - Too posterior
   - Too medial
   - Too lateral
   - Intravascular

3. Inflammation and infection
4. Denatured/expired solutions


The anatomical basis of local anesthesia

General Anatomy and Landmarks for Mandibular Anesthesia
The Masticator Space
includes the Temporal & Infratemporal Fossae

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

The Masticator Space
A Fascial Compartment
Derived from investing layer of deep cervical fascia
Envelopes mandible and muscles of mastication

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

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

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

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**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

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**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
**Blood Supply to the Infratemporal Fossa**

Pterygoid Venous Plexus

Primary drainage to Maxillary vein

**Blood Supply to the Infratemporal Fossa**

Pterygoid Venous Plexus

Connections to:
1. Cavernous sinus
2. Facial vein
3. Inferior ophthalmic vein
4. Pharyngeal plexus

**View of infratemporal fossa with mandible resected**

**View of infratemporal fossa fully dissected**

**MANDIBULAR ANESTHESIA**

Conventional and Alternative Techniques

**Mandibular Anesthesia**

- Mandible: Regional nerve 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 mandibular division block
  - Vazirani – Akinosi mandibular division block
Mandibular Anesthesia

- Mandible: Landmarks
  - Mandibular notch
  - Neck of condyle
  - Coronoid process
  - Coronoid notch
  - External oblique ridge
  - Internal oblique ridge/mylohyoid line
  - Mandibular foramen & lingula
  - Mental foramen

Mandibular Anesthesia

- Mandible: Regional nerve blocks
  - Inferior alveolar nerve block
    - Bisection approach

Mandibular Anesthesia

- Position of mandibular foramen
  - Below mandibular occlusal plane in 75%
  - Even with occlusal plane in 22.5%


Mandibular Anesthesia

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

Mandibular Anesthesia

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

- Inferior alveolar nerve block
  - Intraoral landmarks:
    1. Pterygomandibular raphe
    2. Coronoid notch

Evers & Haegerstam, Introduction to Dental Local Anaesthesia, Mediglobe, 1990
Blanton PL & Roda RS, The anatomy of local anesthesia, J Calif Dent Assoc, 23(4), 1995

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

Physiology of Anesthetic Agents

- The "right" volume depends on many variables
- For infiltration injections, ½ to ¾ cartridge is generally ideal for adults, ½ for kids
- For an inferior alveolar nerve block,
  - Less than ½ cartridge tends to be ineffective
  - ¾ – 1 cartridge is ideal for adults; ⅔ for kids
  - An additional cartridge may increase profundity & decrease onset time*
  - Nusstein et al, Anesthetic efficacy of different volumes of lidocaine with epinephrine for inferior alveolar nerve block, Anesth Prog, Vol 55, 2008

- My concerns
  1. Highly variable success rate
    - 65 – 86% (30 – 97%)
  2. Potential for intravascular injection
    - 3.6 – 22%
Mandibular Anesthesia

- Inferior alveolar nerve block
  - My concerns
  3. Potential injury: nerve, vasculature

- Bisection technique:
  - Unfortunately, most of the mandibular anatomy varies widely
  - Wide flaring mandible
  - Long (A–P) ramus
  - Bulky muscles or buccal fat pad
  - Class III occlusion
  - Missing molar/edentulous
  - Age/children
  - Except one feature, not so much

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
      2. Withdraw 2 – 3 mm, pivot from tip of the needle to the ipsilateral side
      3. Insert 2 – 3 mm posteriorly, pivot back to contralateral side, contact bone again, feel depth
      4. Repeat 1 – 2 times

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

Mandibular Anesthesia

- Inferior alveolar nerve block
  - Needles
    - Length
      - Long 30 – 35 mm
      - Short 20 – 25 mm
      - Ultra-short ~10 mm
    - Gauge (25, 27, or 30)
      - Patients report no perceived difference in pain due to needle gauge
      - Aspiration requires more force the smaller the gauge
      - Fluid injection velocity increases the smaller the gauge
      - Recommendation: 30 gauge short for infiltrations only; 25 or 27 gauge long needles are best for blocks

**Needles**
- **Gauge:** 25, 27, 30
- **Aspiration:** larger gauge more reliable
- **Comfort:** larger gauge less injection pressure
- **Deflection:** larger gauge deflects less

**Deflection**
Larger gauge needles deflect less as the needle passes through soft tissue.

**Breakage**

**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

**Mandibular Anesthesia**
- **Indirect IA technique:** bisection technique = Direct technique
  1. Contact bone anterior to mandibular foramen
  2. Redirect to medial
  3. "Hook" around lingula, insert slightly

When you reach the same injection depth **without** contacting bone,
Stop
Aspirate
Inject
Mandibular Anesthesia
- Mandible: Regional blocks
  - Inferior alveolar nerve block
  - Lingual nerve block
  - Long buccal nerve block
  - Mental (and incisive) nerve block
  - Mylohyoid nerve block
- Complete mandibular division nerve blocks
  - Gow-Gates
  - Vazirani – Akinosi

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
  - The mouth must be open wide!

Mandibular Anesthesia
- Gow-Gates mandibular division block
  - Target: Contact bone at the neck of the condyle

Mandibular Anesthesia
- Gow-Gates complete mandibular division block
Mandibular Anesthesia

- Gow-Gates mandibular division block
  - The mouth must be open wide!
  - Establish the alpha plane
  - Modification: Finger behind the neck of the condyle

- Point of insertion: Maxillary vestibule off the distal-buccal cusp of the second molar or slightly behind...but at what angle?

- Angle (medial–lateral angulation) = Beta plane
  - Varies with width and flare of mandible and ramus
  - Aim for your extraoral finger behind the neck of the condyle (angle ~10–15° up)

- Depth: 25–28 mm (contact bone)
- Needle: Long
- Amount: 1–2 cartridges (⅔ - 1⅓ for child)
- Comfort level: Moderate to high
- Keep mouth open for 2 to 1.5 minutes after deposition of the anesthetic

Mandibular Anesthesia
- Complete mandibular division nerve block
- Vazirani – Akinsi mandibular division block
  A closed mouth technique

Vazirani – Akinsi
- 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 – Akinsi mandibular division block
  A closed mouth technique

Vazirani – Akinsi Quadrant Block
Have the patient slide their lower jaw towards the injection side

Image courtesy of Dr. Mel Hawkins

Meechan, Practical Dental Local Anesthesia, Quintessence, 2002
Hawkins JM, Local Anesthetic Techniques and Adjuncts, Chapter 13: Pain & Anxiety in the Dental Office, WB Saunders, 2002
Mandibular Anesthesia

- Vazirani – Akinosi mandibular division block
  - Depth: 25 – 30 mm (no bone contact)
  - Needle: Long
  - Amount: 1 – 2 cartridges (⅔ - ⅓ for child)
  - Comfort level: Moderate

  Injection site visibility difficult with mouth closed

Mandibular Anesthesia

- 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

Mandibular Anesthesia

- Gow-Gates technique
  - Advantages:
    - Very high success rate (90 – 100%)
    - Extremely low incidence of positive aspirations
    - Significantly reduced incidence of trismus and/or paresthesia
    - 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

Mandibular Anesthesia

- Vazirani – Akinosi technique
  - Advantages:
    - Moderate to high success rate (96 – 96%)
    - 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

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

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
  - First, give a block injection
    - The Gow-Gates mandibular division block has a significantly higher success rate than all other techniques
      - Gow-Gates 52%
      - Vazirani – Akinosi 41%
      - Conventional IA 36%
      - Buccal-plus-lingual infiltration 27%
  - No technique was fully acceptable by itself

Troubleshooting Mandibular Anesthesia

- Innervation of mandibular teeth, particularly molars, from the cervical plexus
  - Great auricular nerve
  - Transverse cervical nerve
  - 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 25% 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

- Patients who took 600mg 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.”
- Solution: a buccal &/or lingual infiltration below the apices of the teeth is likely to block any innervation coming up from the neck
**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 – 69%; articaine 75 – 93%
- Lido 6.1 – 11.3 minutes; articaine 4.3 – 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

**Troubleshooting Mandibular Anesthesia**

- Repeated failure to achieve adequate anesthesia
- Take a panoramic radiograph

**The Anatomical Basis of Local Anesthesia**

General Anatomy and Landmarks for Maxillary Anesthesia
Maxillary Anesthesia
- Trigeminal nerve, CN V
  - Maxillary division, CN V2
    - Sensory only
    - To all maxillary teeth and gingiva
  - Mandibular division, CN V3
    - Both motor and sensory
    - Sensory to all mandibular teeth and gingiva
    - Motor to primary muscles of mastication

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 pterygomanxillary 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

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

Blood Supply to the Infratemporal Fossa
- Pterygoid Venous Plexus
- Primary drainage to Maxillary vein

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 regional blocks:
  - Anterior & middle superior alveolar nerve block
  - Infraorbital nerve block
  - AMSA palatal block
  - ASA palatal block
  - Posterior superior alveolar nerve block
  - Nasopalatine nerve block
  - Greater palatine nerve block
  - Complete maxillary division block

Maxillary Anesthesia

- Maxilla: Regional nerve blocks
  - Anterior & middle superior alveolar nerve block
  - Infraorbital nerve block approach

Delivered at the infraorbital foramen
Palpate the inferior orbital rim

- Depth: 3 – 10 mm
- Needle: Short
- Amount: 1/3 – 1/2 cartridge
- Comfort level: Moderate to high (technique dependent)
Maxillary Anesthesia

- Anterior & middle superior alveolar nerve blocks
- Infraorbital approach
  - Comfort level: Moderate to high (technique dependent)

Note: You do not need to get the needle tip into the foramen

Jastak, Vafaee & Somaiah, Local Anesthesia of the Oral Cavity, WB Saunders Co, 1995

Maxillary Anesthesia

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

Meechan, Practical Dental Local Anesthesia, Quintessence, 2002

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

Maxillary Anesthesia

- Anterior & middle superior alveolar nerve block
  - 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/bicuspids
  - Disadvantages
    1. Shorter duration
    2. A palatal injection

Meechan, Practical Dental Local Anesthesia, Quintessence, 2002

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:
      - Incisor pulps
      - Buccal tissue
      - 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

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

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

Maxillary Anesthesia
- Complete maxillary division block
  - PSA (lateral) approach

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

- Complete maxillary division block
  - Greater palatine canal approach

<img src="image1.jpg">

Meechan, Practical Dental Local Anesthesia, Quintessence, 2002
Fehrenbach & Herring, Illustrated Anatomy of the Head & Neck, Saunders, 1996

Maxillary Anesthesia

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

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

Maxillary Anesthesia

- Complete maxillary division block
  - Greater palatine approach
  - Depth Varies, ~15 mm
  - Needle Long
  - Amount 1 cartridge
  - Comfort level Moderate

Keys to Success

- Anesthetic failures happen
- The “Three Strikes Rule”
  - 3 attempts at anesthesia, then stop

- It’s not about “fault”
- It’s not the patient’s fault
- It’s not your fault
- Failures happen

Reschedule the patient!