Mandibular LA: Techniques

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LA Options for the Mandible

- Mandibular Anesthesia
  - Infiltration
    - Block
      - Submucosal
      - Supraperiosteal
      - Supplementary
• Infiltration LA techniques is NOT effective in the posterior part of the adult mandible (Why?)

• Block LA is the most commonly used technique for the mandible

• Infiltration in mandible can be given in:
  1. Children
  2. Anterior mandible in adults (except elderly?)
  3. Soft tissue anesthesia only (lip, tongue, cheek, floor of the mouth) ➔ Submucosal Infiltration
  4. Supplemental anesthesia
Revision

coronoid notch

condylar process

coronoid process

mandibular foramen

alveolar process

mental foramen

ramus

body

external oblique ridge
Articular disk
Head of mandible, articular surface

Temporals
Lateral pterygoid, superior part
Lateral pterygoid, inferior part
Masseter, deep part
Medial pterygoid
Masseter, superficial part
Lingual Nerve

Long Buccal Nerve

Inferior Alveolar Nerve
LA for the Mandible

1. Inferior Alveolar Nerve (IAN/IDN) Block (with Lingual Block)

- **Target**
  - Mandibular foramen (pterygomandibular space) + Lingual nerve

- **Area anesthetized**
  - All lower teeth on one side (unilateral)
  - Unilateral tongue, floor of mouth & lingual gingiva/periosteum of all lower teeth
  - Unilateral buccal gingiva/periosteum of lower premolars & anteriors
  - Unilateral lower lip skin & mucosa
• **Indications**
  - Dental procedures (resto, endo, crown) on single or multiple lower teeth
  - For extraction or perio (+ buccal infiltration)
  - Surgical procedures in the posterior mandible (+ buccal)

• **Contraindications**
  - Bleeding tendency patients (e.g. hemophilia)
  - Young children (Why?)
  - Mentally handicapped patients?
  - Acute infection in the site of injection (esp. pus)
• IDN (IAN) Block can be given bilaterally

• IDN block is the most technique-sensitive LA in dentistry

• To give successful IDN block you have to think in 3-D way & follow the landmarks
Standard Technique for IDN Block

• **Technique**
  - A 25/27 gauge Long needle
  - Dry the area & Apply topical anesthesia
  - Open the mouth widely
  - Follow the landmarks of IAN block:
    1. External oblique ridge
    2. Coronoid notch
    3. Pterygomandibular raphe
    4. Contralateral lower premolars
    5. Occlusal surface of lower posterior teeth
- Slide your other hand index or thumb over the external oblique ridge intraorally till you reach the coronoid notch
- Keep your finger on the coronoid notch & rotate it so your nail is vertical & facing medially
- Push toward the cheek by that finger to see the pterygomandibular raphe clearly
- Bring the needle from the other side just above the premolars
- Insert the needle just lateral (anterior) to the posterior border of the raphe (≈ ¾ distance from the finger & the posterior border of the raphe) & make sure you are parallel to & 5 mm above the occlusal surface
- Insert the needle until you touch the bone while $\frac{1}{2} - \frac{2}{3}$ of the needle is inserted
  (If early touch: you are too much anterior, If late touch: you are too much posterior, so go out & insert again)
- Don’t change needle direction/angulation while inserted
- Withdraw the needle slightly (1mm) or keep touching the bone & aspirate
- If aspiration is –ve, inject slowly $\frac{2}{3}$ of carpool
- Withdraw the needle slowly & in the midway inject to block the Lingual Nerve
• Key factors for successful IAN block:

1. Bone touch while ½ - ⅔ of needle is inserted
2. The needle parallel to occlusal surface & is just above occlusal surface (5 mm)
3. The needle is directly anterior (lateral) to the posterior (medial) border of the raphe

- Wait 5 min then check the anesthesia by asking the patient about tingling/numbness in lower lip & half of the tongue
- The degree of numbness is not important, the important is that there is numbness/tingling
Anatomic variation may exist:

- Some patients have higher position of mandibular foramen, check the OPG if the block failed, and give higher injection (up to 10 mm above occlusal surface)

- Elderly patients with edentulous mandible inject higher than the ridge level because the teeth are lost and there is bone resorption
Video
Causes of Failure of IAN Block

1. Wrong technique
2. Infection
3. Anatomic variations (can be adjusted)

- Late touch (e.g. > ⅔ of the length of the needle inserted) may inject the LA in the deep part of the parotid gland which may block the Facial Nerve
Complications of IAN Block

1. Intraoperative complications:
   - Hematoma due to rupture vessel (v. rare)
   - Intravascular injection of LA (avoidable)
   - Transient unilateral facial palsy due to facial nerve block if you enter the parotid (avoidable)

2. Postoperative complications:
   - Trismus (due to injection in the medial pterygoid muscle, or infection, or hematoma)
Vazirani-Akinosi Technique for IAN Block (Closed-mouth Technique)

- **Indications**
  - IAN block in patients with Trismus

- **Technique**
  - The mouth is closed
  - Needle is aligned parallel to occlusal plane at the level of mucogingival junction of maxillary molars (beside the maxillary tuberosity)
  - Insert $\frac{2}{3}$ of the long needle just medial to ramus
  - Aspirate then inject $\frac{2}{3}$ - full carpool
Video

25 gauge long needle
2. **Long Buccal Infiltration**

- **Target**
  - Nerve endings of Long Buccal Nerve

- **Area anesthetized**
  - Buccal soft tissues (buccal gingiva, periosteum & buccal mucosa) of lower molars on one side
• **Indications**
  - Dental procedures involves buccal soft tissues of lower molars (e.g. extraction, perio)
  - Soft tissue surgery at that area

• **Contraindications**
  - Infection in the site of injection

• **Site of Injection**
  - In the start of the buccal mucosa (just beyond vestibule) opposite to the molar tooth
  - For soft tissue surgery only, in the buccal mucosa at the area of surgery
• **Technique**
  - Short or Long needle?
  - Dry the area & Apply topical anesthesia
  - Half close the jaw & with your finger retract the cheek
  - Insert the needle Submucosal (just the tip) at the start buccal mucosa of the area of procedure
  - Inject slowly small amount of anesthesia
  - Check the aesthetics (How?)
3. **Mental Nerve Block**

- **Target**
  - Mental foramen (Mental nerve + Incisive nerve)

- **Area anesthetized**
  - Lower premolars teeth (pulp/PDL) unilateral
  - Lower anterior teeth unilateral
  - Buccal gingiva of lower premolars & anteriors
  - Alveolar bone of lower premolars & anteriors
  - Lower lip skin & mucosa unilateral
• **Indications**
  - Dental procedures (resto, endo, crown) on single or multiple lower premolar/anterior teeth on one side
  - For extraction or perio of premolar/anterior teeth (+ lingual infiltration)
  - Surgical procedures in the premolar/anterior area of mandible (+ lingual infiltration)
  - Surgery of lower lip (skin &/or mucosa)

• **Site of injection**
  - Mucobuccal fold between 1\(^{st}\) & 2\(^{nd}\) lower premolars

• **Contraindications**
  - Acute infection the site of injection
• **Technique**
  - A 25/27 gauge Long needle
  - Dry the area & Apply topical anesthesia
  - Stand in side-behind position
  - Half close the jaw & with your finger retract the lower lip/cheek
  - Insert the needle in the mucobuccal fold between lower 1\textsuperscript{st} & 2\textsuperscript{nd} premolars vertically with the syringe slightly tilted backward until you touch the bone (½ the needle inside)
  - Withdraw needle 1 mm, Aspirate & Inject slowly ⅔ of the carpool
  - Wait 3-5 min then check the aesthetics (How?)
Video
4. **Infiltration Anesthesia for Anterior Mandible (Labial &/or Lingual Infiltration)**

- **Target**
  - Nerve endings of incisive & mental nerves (labial infiltration) & nerve endings of lingual nerve (lingual infiltration)

- **Area anesthetized**
  - **Labial Infiltration:** Lower anterior tooth, labial soft tissue & alveolar bone of lower anterior
  - **Lingual infiltration:** Lingual soft tissues of lower anterior tooth or lower premolar
• Labial & Lingual infiltration of lower anterior teeth is the anesthesia of choice for these teeth due to thin porous bone

• Lower central incisors receive bilateral innervations from other side

• Elder patients have denser bone & may need Mental or IDN block for lower anteriors
• **Indications**
  
  • Lower Labial Infiltration:
    - LA for 1 or 2 lower anterior teeth
    - Surgery or extraction & perio for lower anterior (+ lingual infiltration)
    - Small surgery in the lower labial soft tissues
  
• **Contraindications**
  
  - Acute infection in the site of injection
• **Technique**

• **Lower Labial Infiltration:**

- A 30 gauge Short needle, Dry & Apply topical
- Half close the jaw, retract the lower lip
- Insert the needle at 45° in the mucobuccal fold
- Depth of insertion is supraperiosteal
- Inject slowly $\frac{1}{2}$-$\frac{2}{3}$ of the carpool
- Wait 2-3 min then check the anesthesia (How?)
• **Technique**

• Lingual Infiltration:

- A 30 gauge Short needle, Dry & Apply topical
- Widely open the jaw, retract the lower lip
- Insert the tip of the needle vertically in the lingual mucobuccal fold (in floor of the mouth)
- Depth of insertion is **submucosal only**
- Inject slowly small amount of anesthesia
- Wait 2-3 min then check the anesthesia (How?)
Mandibular Nerve Block (Gow-Gates Technique)

- Very rarely used

**Target:**
- Condylar neck just below lateral pterygoid muscle attachment

**Landmarks**
- Intertragic notch (depression between tragus & antitragus of the ear)
- Angle of the mouth
- Mesiolingual cusp of upper 2\textsuperscript{nd} molar
- Coronoid notch & pterygomandibular raphe
Intertragic Notch
• **Technique:**
  - Dry the area & Apply topical
  - Widely open the mouth
  - Insert 25 G Long needle in lingual side of the ramus distal to mesiolingual cusp of upper 2\textsuperscript{nd} molar parallel to the line between intertragic notch & angle of the mouth
  - Go until bone touch (condyle neck) with \( \frac{2}{3} \) of the needle inside
  - Withdraw 1 mm then Aspirate
  - If negative, inject slowly a full carpool
  - Keep the mouth opened for 1-2 min.
  - Wait and check the anesthesia (How?)
Video

25 gauge long needle
How to Check the Aesthesia?

Infiltration

Objective (testing by a probe)

Block

Subjective (ask the patient about numbness/tingling)
Thank You