Local anesthesia lec # 10

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Anesthetic techniques of the mandible:

Successful pulpal anesthesia of mandibular teeth is a bit more difficult to achieve in comparison with the maxilla. Reasons behind that include:

1. the greater density of the bone which is 7 times more than that of the maxilla
2. The wide variation in anatomy.

**There for local infiltration is not the choice for mandibular anesthesia all though it might work in the:**

1. **Anterior region do to the presence of foramina (not do to a less dense bone).**

In the anterior region (centrals, laterals, and **canines**) local infiltration of the anesthetic solution passes through the foramina into the bone anesthetizing the incisive never (this passage is made by massaging the area of injection pushing the solution through the foramen) and in this case it requires a supplemental lingual infiltration.

1. **Children less than 6yrs old**

In case of a child less than 6yrs of age ( meaning that the permanent first molars haven’t yet erupted ) there is a high percent that a soft tissue injury will happen in case of alveolar nerve block there for it is ideally a contra indication in this case to go for a block even if it was a D or E , but you have to assess at first the pt. cooperation by observing how he acted when he first entered the clinic , sat on the chair , opened his mouth for examination when he was assigned to , and his reaction to applying an injection.

In case the pt. isn’t cooperative you should go for g.a (general anesthesia).

**In general the technique of choice for mandibular anesthesia is the block technique** which is the deposition of anesthetic solution just close to the nerve trunk (target area).

**The target area has to be known; its location, and anatomy** (ex: where is the mental foramen, where is the mandibular foramen, where is the long buccal never which should all be known by you**)**

**INCISIVE and MENTAL NERVE BLOCK**

**The mental nerve** is a terminal branch of the inferior alveolar nerve. Exiting the mental foramen at or near the apices of the mandibular premolars, it provides sensory innervation to the buccal soft tissues lying anterior to the foramen and the soft tissues of the lower lip and chin on the side of injection.

Areas Anesthetized. Buccal mucous membranes anterior to the mental foramen (around the second premolar) to the midline and skin of the lower lip and chin

**The incisive nerve** is a terminal branch of the inferior alveolar nerve. Originating as a direct continuation of the inferior alveolar nerve at the mental foramen, the incisive nerve continues anteriorly in the incisive canal, providing sensory innervation to those teeth located anterior to the mental foramen. The nerve is always anesthetized when an inferior alveolar or mandibular nerve block is successful; therefore the incisive nerve block is not necessary when these blocks are administered. The **first** **premolar, canine, and lateral and central incisors**, including their buccal soft tissues and bone, are anesthetized when the incisive nerve block is administered.∗

\***The second premolar may not be anesthestized with this technique if the mental foramen lies beneath the first premolar very close to the second premolar.**

Areas Anesthetized.

1. Buccal mucous membrane anterior to the mental

foramen, usually from the second premolar to the

midline

2. Lower lip and skin of the chin

3. Pulpal nerve fibers to the premolars, canine, and incisors

An important thing to know is that **every incisive nerve block is a mental block** but **not** the opposite, the difference is in the technique.

First thing to know before any block administration is the **target area** which in this case is the **mental foramen** where the inferior alveolar never divides into two terminal braches **the incisive nerve** which supplies **the bone** of the anterior region of the mandible and **the mental nerve** that only gives **the soft tissue** of the anterior region of the mandible.

When buccal **soft-tissue anesthesia is necessary** for procedures in the mandible anterior to the mental foramen, such as Soft-tissue biopsies, Suturing of soft tissues **mental block is given only**. But when there is involvement of **the bone (dentoalveolar process) and the buccal gingival** mucosa we go for **incisive block**.

NOTE : the incisive never block is preferred over the inferior alveolar block in pt. who aren’t medically fit because the intra vascular injection incidence incase of inferior alveolar nerve block is 10 – 15% .

Let’s talk about the location of the target area (mental foramen):

The mental foramen lies usually (70%) in between the apexes of the second and first premolars in the **anterior posterior** third of the mandible but **closer to the apex of the second premolar** where in some cases it can lie anterior to the usual position or more posterior .

So the **usual position** of the mental foramen is between the apexes of the second and first premolars but closer to the apex of the second premolar in an anterior posterior location.

Where as in the vertical dimension or the **inferior superior dimension** it is located **exactly midway** between the alveolar crest and the lower border of the mandible.

Clinically we can say that the mental foramen is located **intra or extra orally**:

**Extra** orally it is positioned on a line continues with the **pupil** of the pts eye, and the **infraorbital foramen** and this line locates its anterior posterior position.

But the best way to locate it is the **intra oral** way which is done by placing your **index finger** in the mucobuccal fold and pressing against the body of the mandible in the first molar area. Move your finger slowly anteriorly until the bone beneath your finger feels **irregular** and somewhat **concave**. The patient may comment that finger pressure in this area produces **soreness** as the mental nerve is compressed against bone.

**NOTE: in case of a *child* the location of the mental foramen inferior superiorly is one third of the distance from the lower border to the alveolar crest of the bone not midway because the alveolar bone is highly developed while the basal bone isn’t and we have a mixed dentition. Also in case of an *edentulous or elderly pt.* it is still in its same usual position put because of the resorption of the bone it becomes more superficial.**

**OPG** is the radiograph used to locate the mental foramen**.**

**\*\* the doctor showed a radiograph that shows 2 mental foramen pointing out the we can have what is called an accessory mental foramen which an accessory nerve exists from which accounts for 3-4% in the Jordanian population while in the Iraqi population its 7% and this is important to know in case of alveoloplasty or genioplasty any procedure concerning the mental foramen.**

Concerning the technique:

* The “old” position of choice —sitting behind the patient— was psychologically traumatic for the patient. The syringe was always in the patient’s line of sight **so the new position to consider is *sitting (not a most just the ideal)* in front of the patient.**
* In the old method you had to enter the tip of the needle inside the foramen for the technique to be successful **while the new method conceders it traumatic to the never to enter the needle inside the foramen and implies that you insert the tip of the needle 5-6 mm anterior to the foramen then you advance it until reaching the estimated location of the mental foramen and then give the recommended volume of the anesthetic solution.**
* **To achieve an incisive nerve block you have to inject the local anesthetic solution under finger pressure applied for at least 1 min to let it pass through the foramen. or just massage it clockwise on the right side of the mandible or anticlockwise if on the left side since the mental foramen looks more superior and posterior**
* You also need to supplement your injection with **a lingual anesthesia to anesthetize the lingual mucoperiosteum** sincethe incisive never block anesthetizes buccal gingival , teeth , pulp of teeth, and **alveolar bone not basel bone** until reaching the midline **except for the mucoperiosteum on the lingual side .**

The main indication for mental nerve block is soft tissue procedures.

The main indication for incisive nerve block is where bilateral extraction of anterior teeth  is required. (Don't give bilateral ID Block; The bilateral ID Block is inconvenient to the patient cause the mandible is a mobile jaw Not like the maxilla which is fixed and we can give bilateral anesthesia for it..... You can do ID Block in one side and incisive block; in this case we have less soft tissue anesthesia which is more convenient to the patient).

If the incisive nerve block was failed this means that you didn't make adequate massage or pressure over the area of anesthesia.

Look for advantages And disadvantages of incisive nerve block from the book (Dr. Said that he'll put a question in the exam about them) 😁

Long buccal nerve anesthesia

Another names: Buccinator nerve anesthesia OR buccal nerve anesthesia.

Area anesthetized: Soft tissues and periosteum buccal to the man. Molar teeth.

Indication: When we need to manipulate buccal soft tissue in the mandibular molars region.

This nerve runs anterior inferiorly until reaching the occlusal plane level turns laterally to pass the anterior border of the ramus (this nerve is not very significance; so if we cut it during making a flap or osteotomy, it'll be not significant to the patient cause it supply limited soft tissue anesthesia .

 If you want to block long buccal nerve, you have to give the injection adjacent to the nerve trunk  (on the ant. Border of the ramus), But if you want to give infiltration, you deposit the solution in the depth of the vestibule or the buccal cheek. ((if you want to make extraction, You have to block the nerve. But in RCT you give infiltration only; no need for block)).

Inferior Alveolar Nerve Block (IANB)

\* The most common block injection used in dentistry.

\* Success ratio for IANB is 80%. (negative aspirations).

\* failure ratio for IANB is 20%. (positive aspirations)

\* The target area (the area in which you deposit the LA in): Just close to the IAN; where it enters the mandibular foramen (lingula) ; which is as the mental foramen, subjective to anatomical variations. Normally the man. Foramen located 1cm above the occlusal plane ,in

children it is at the level of occlusal plane, in elderly it is more superior to the original position, in ptn with prognathic mandible  it is more inferior to the original position, in ptn with retrognathic mandible  it is more superior to the original position.

The landmarks that I'll depend on to locate the nerve (man. Foramen) :

3- the occlusal plane (it is 1cm above the occlusal plane).

1- Coronoid notch ( the greatest concavity on the anterior border of the ramus). (I locate it by moving my thumb superiorly and inferiorly on the anterior border of the ramus; your thumb's nail is toward the medial side of the mandible and the mid point of your finger must coincides with the mid point of the concavity, at the same time you do retraction for the cheeks)..... The first landmark/point.

2- pterygomandibular raphe (the deepest point on it), the pterygomandibular raphe has two limbs (one vertical and the other horizontal, the point at which they meet is the deepest point)... This is the second point.

3-  occlusal plane (it is 1cm above the occlusal plane).

# when you draw a line between the first and second points, the mid point of this line will represent the vertical level of insertion point location, while the anterior posterior level is 1/3 from the deepest portion of the pterygomandibular raphe towards the mid point of the finger or 2/3 of the distance from the mid point of the finger to the pterygomandibular raphe, we approach this point from the Contralateral side between the two premolars (this is in the normal ptns, but some ptns has a divergent ramus; mildly, moderately or severely divergent, so you have to change the angulation using The GOW-GATES TECHNIQUE or VAZIRANI-AKINOSI CLOSED-MOUTH TECHNIQUE).

# The lingual nerve is in front of the IAN and medial to it by about 1cm, so close to the wisdom tooth; just beneath the periosteum, so when you make a lingual flap it will be inside the flap.

# We have to achieve adequate depth of penetration when you insert the needle 💉, if you didn't, your anesthesia will fail, this depth is 25mm in average size persons.... But be careful not to insert the full length of the needle cause it may breaks inside the patient's mouth.

# insert the needle until you feel bony contact then go a little bit back then inject, Don't inject any of the anesthesia solution if you didn't feel the bone; cause you may be inside a vessel .

# After you inject the solution, you have to wait 3-5 mins. Until the subjective indicator appears which is the tingling of the half of the  lower lip, this subjective sign not reliable indicator for the depth of anesthesia. (even the lip is anesthatized, it may feel pain during extraction).

   The objective sign indicates the depth of anesthesia; which means a pain free procedure .(you extract the tooth without any pain).

# No relation between the dose of LA and the environmental factors (smoking, weight, age...) until now in the literatures!, But there is a relation between smoking and general anesthesia and sedation.

# Nooo releasing incision in the lingual side or the palatal side; cause you will damage the nerves.

# In IANB we anesthetize Teeth, periodontal ligament, alveolar bone around teeth, lingual nerve, mental foramen.

\*\*\* When you make IANB don't forget to give anesthesia to the long buccal nerve when you want to make the procedure for molr teeth.

\*\*\* When the ptn still in pain after you give him (IANB + long buccal nerve block), specially in the lower first molar , give him intraligamental injection cause the tooth may have accessory innervation from mylohyoid or accessory cervical, specially the mesial root..... If I give All of these injections and the ptn still in pain this means that the ptn has bifid IAN OR bifid mandibular canal, in this case I have to make injection called GOW-GATES TECHNIQUE.