

# **The Anatomy of Local Anesthesia: The Maxilla**

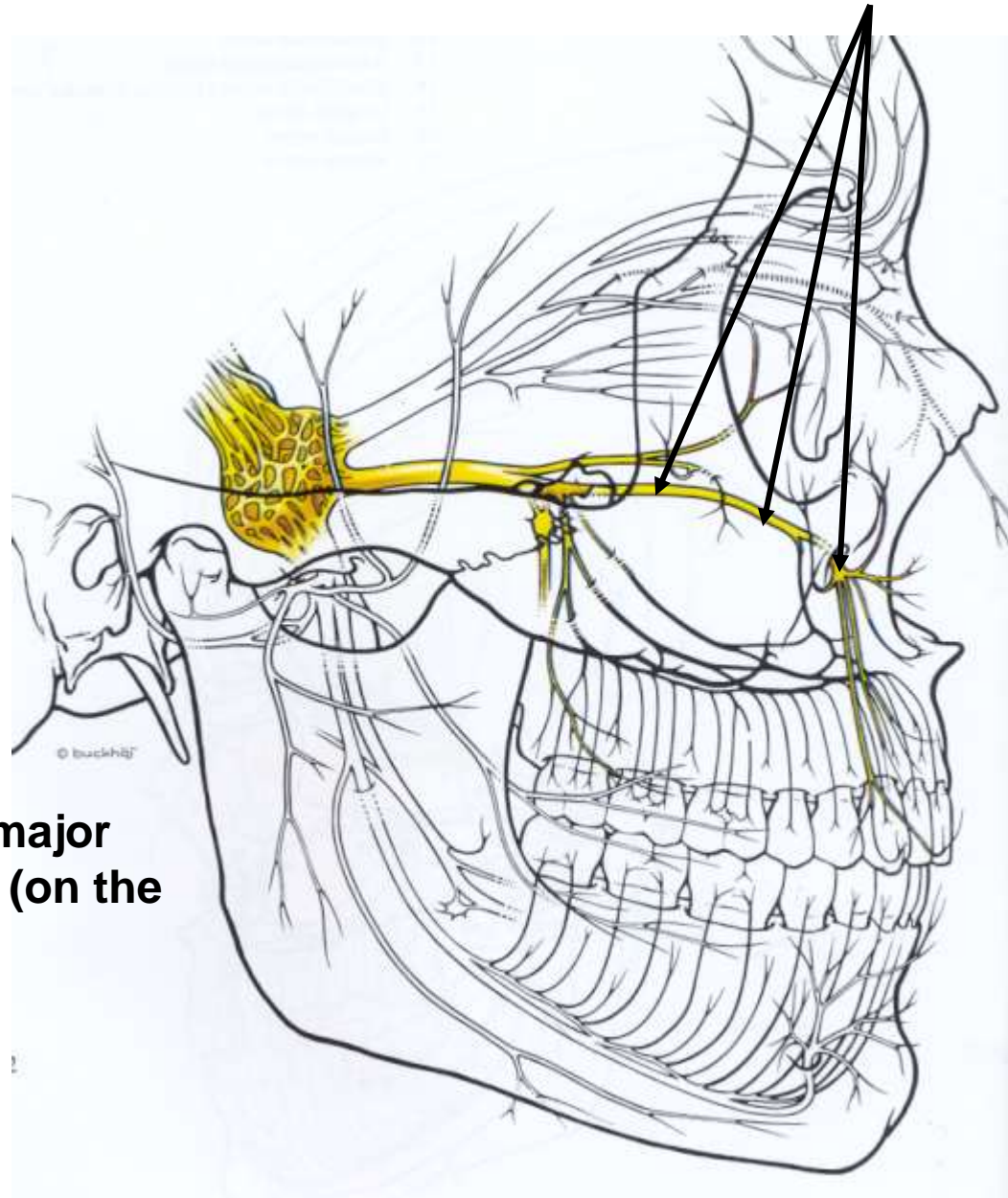
University of Detroit Mercy Dental  
School

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We have to start  
somewhere. Let's start  
with  
*Pulpal Anesthesia of  
Maxilla*

# Infraorbital nerve



**Maxillary division of trigeminal nerve. Its major branch is infraorbital (on the floor of the orbit).**

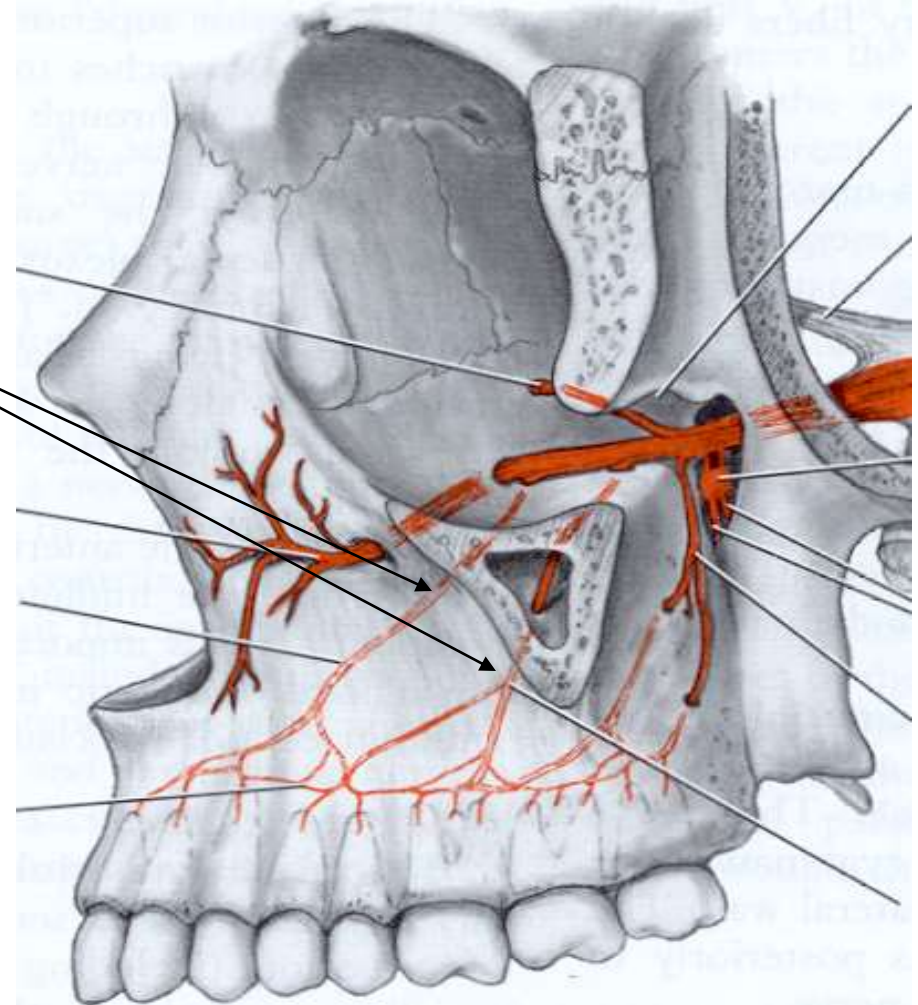


# *Maxillary Pulpal Innervation*



From the groove and canal, branches come down the wall of the maxillary sinus, to innervate the upper teeth.

These are the nerves that we are concerned with, in pulpal anesthesia of the maxillary teeth.

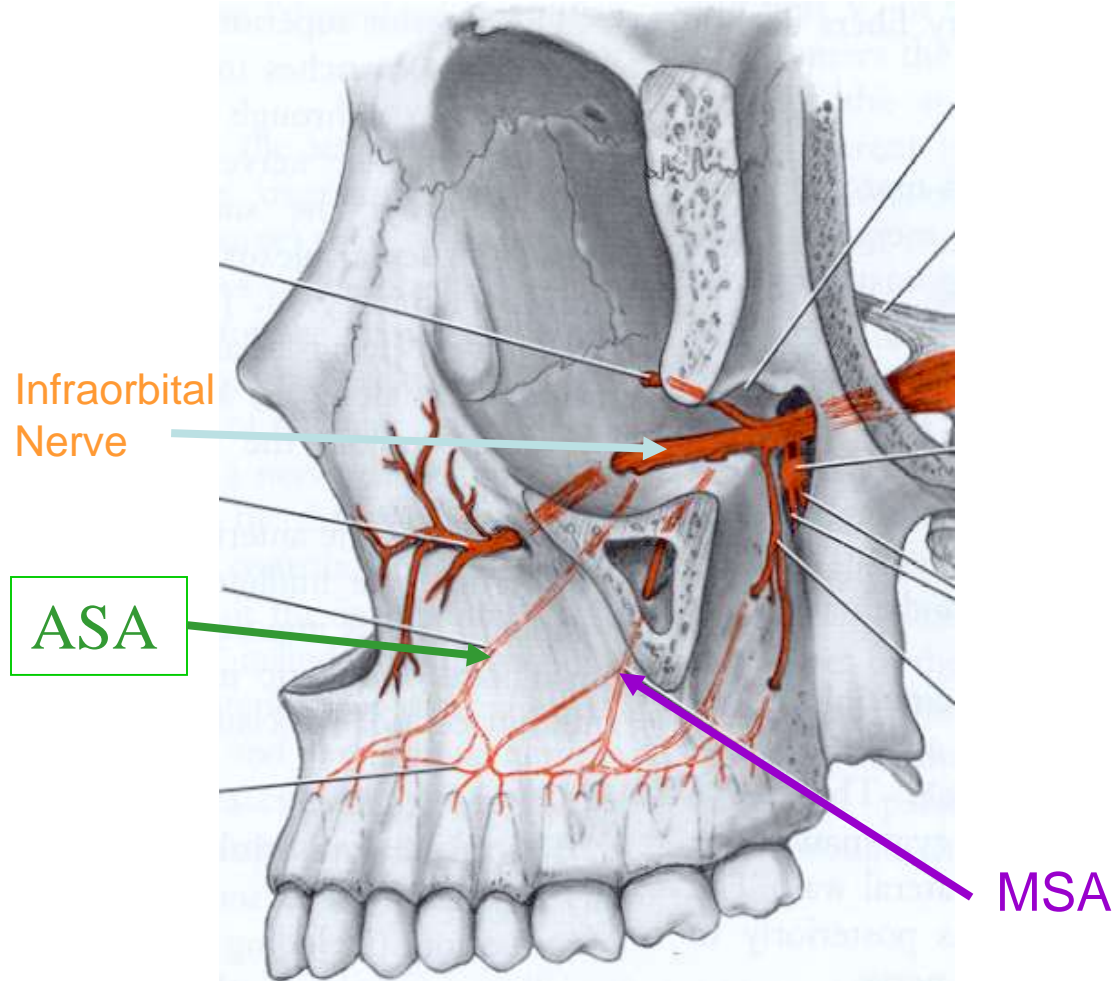




# Branches of Infraorbital Nerve

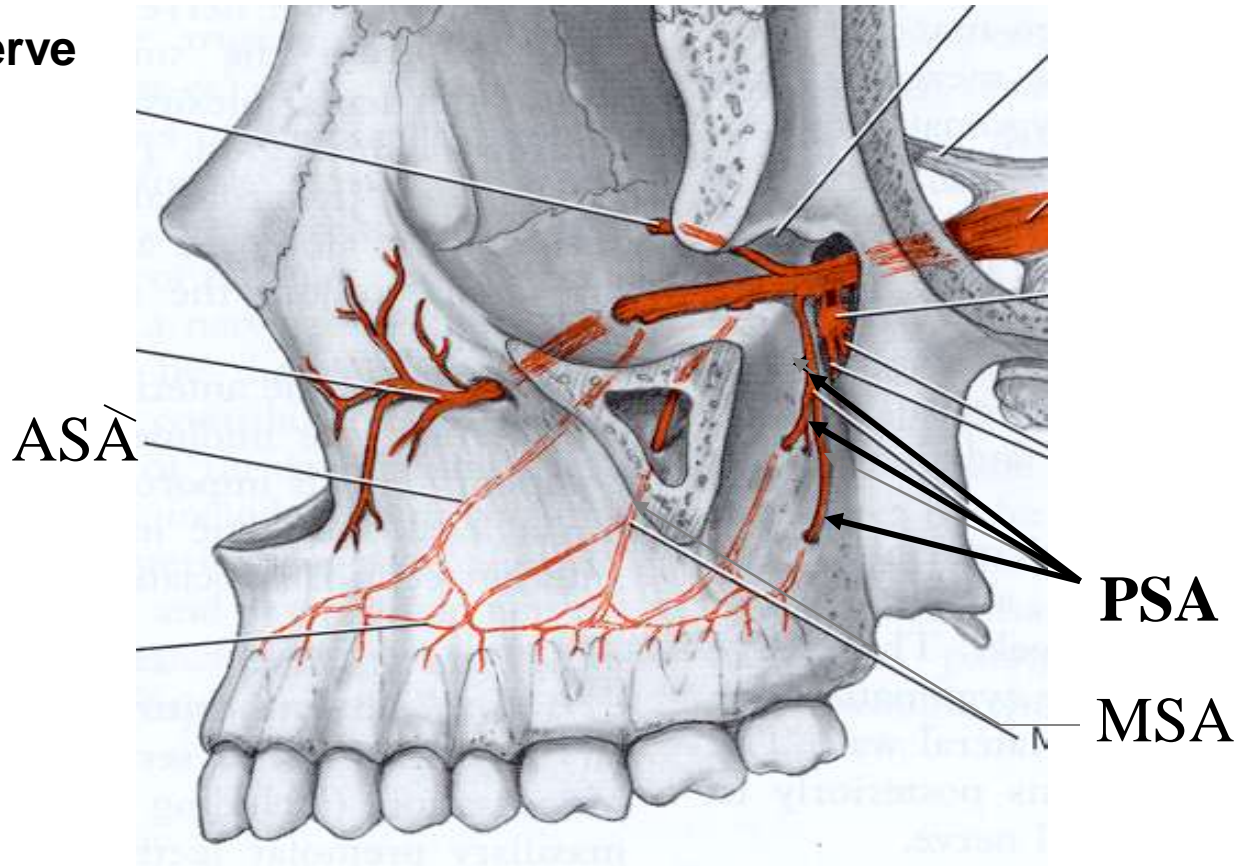
- During its course through the floor of the orbit, the *infraorbital nerve*, gives off branches. We give them these names:

- middle superior alveolar nerve (MSA)
- anterior superior alveolar nerve (ASA)



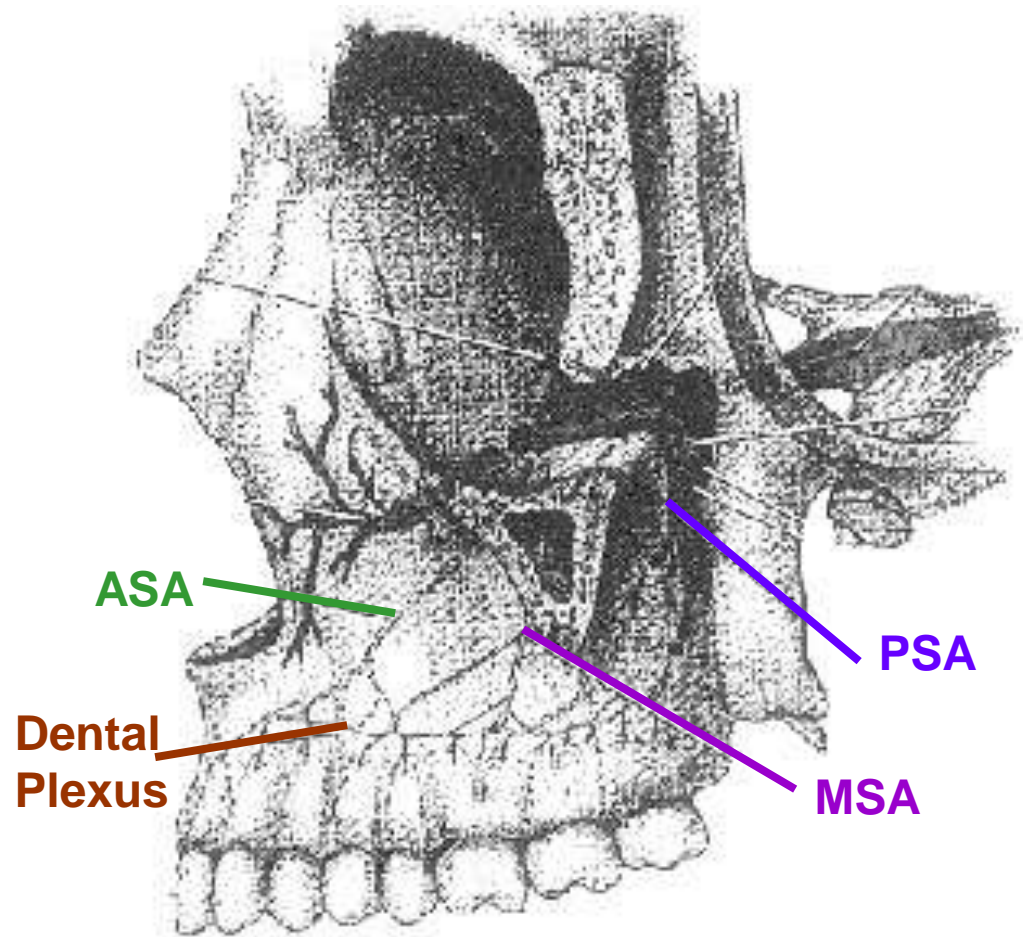
# Posterior Superior Alveolar Nerve (PSA)

Posterior superior alveolar nerve is a little different.



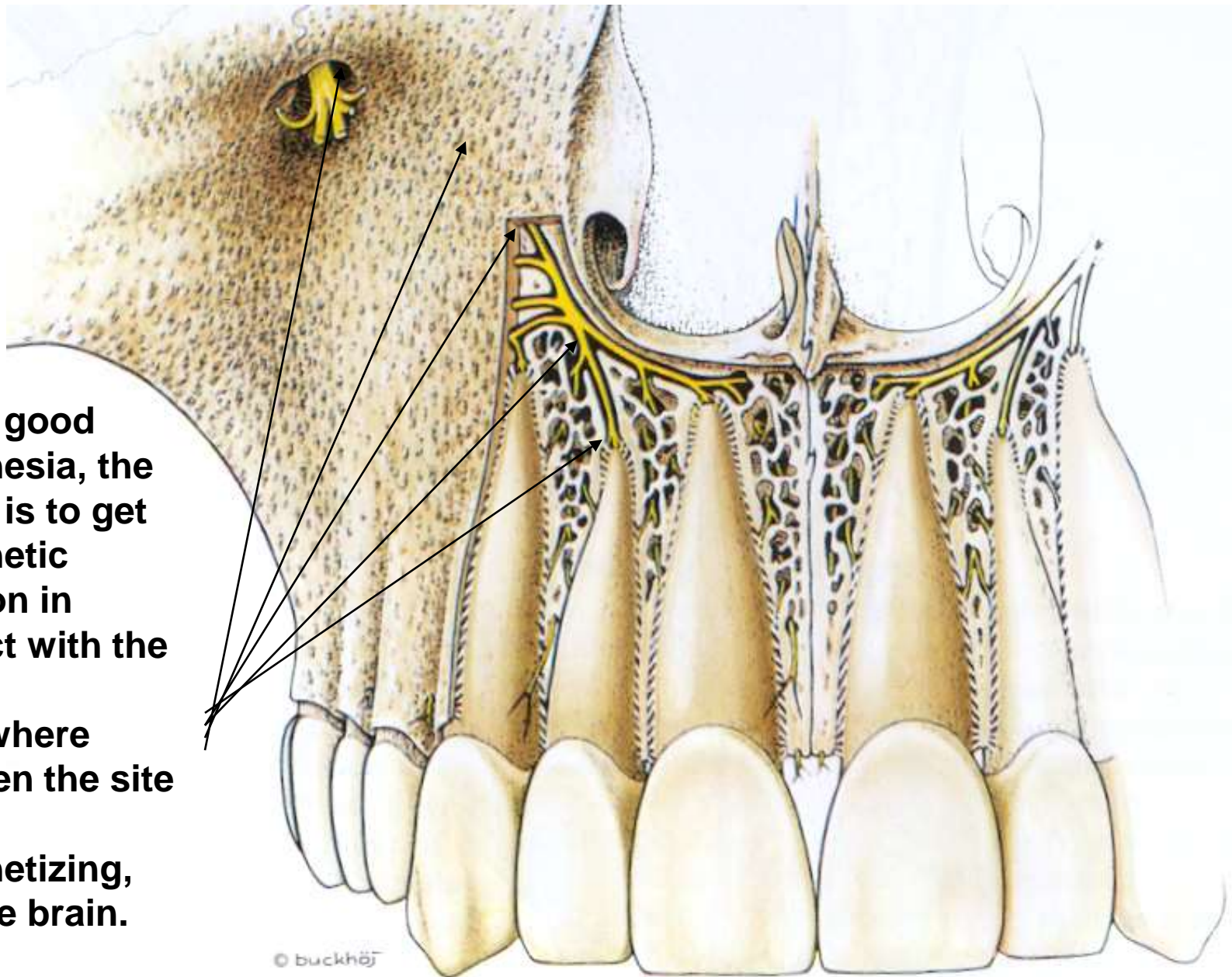
# Superior Alveolar Plexus

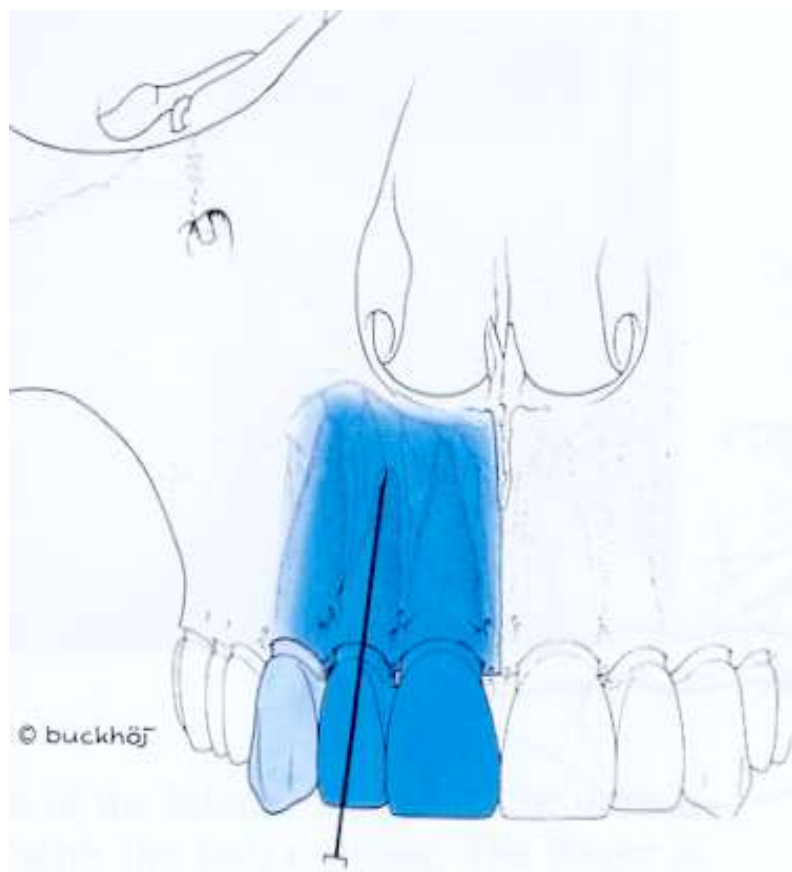
- All three nerve branches (**ASA**, **MSA**, **PSA**) form a **dental plexus** (a meshwork of nerves) **which, in turn, innervate the pulps of the maxillary teeth.**





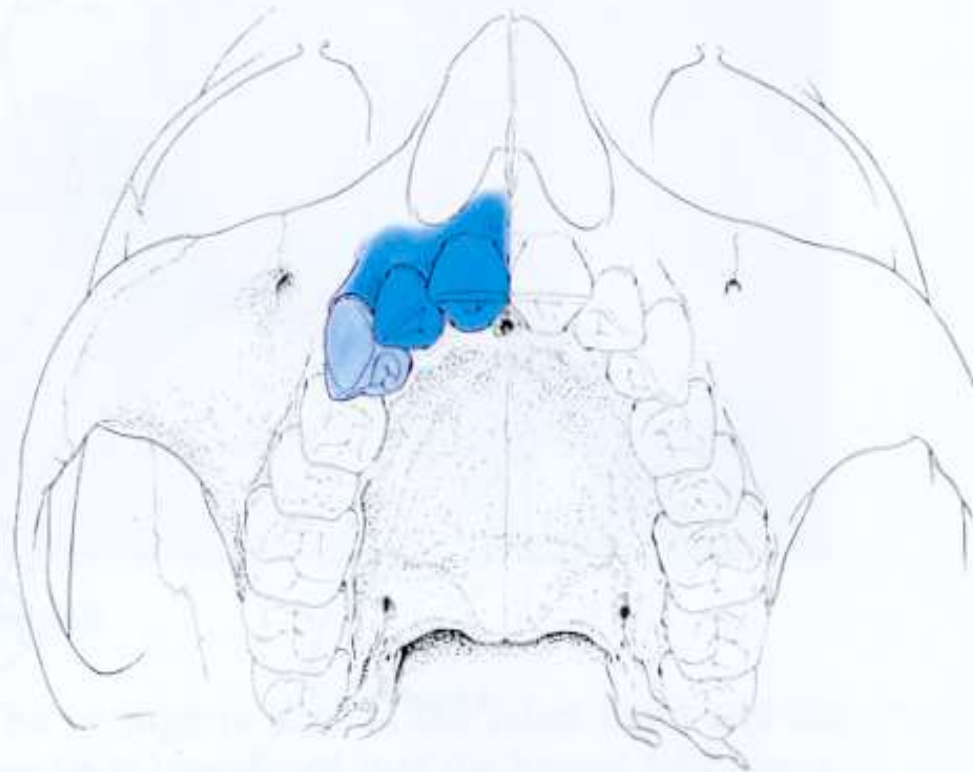
**To get good anesthesia, the object is to get anesthetic solution in contact with the nerve somewhere between the site we're anesthetizing, and the brain.**





**Infiltration of tooth # 7 will anesthetize other structures in the vicinity: # 8, and possibly # 6.**

Fig. 55.



**Note: unfortunately, this labial infiltration injection will not anesthetize the palatal tissue**

# Infiltrating Tooth # 7





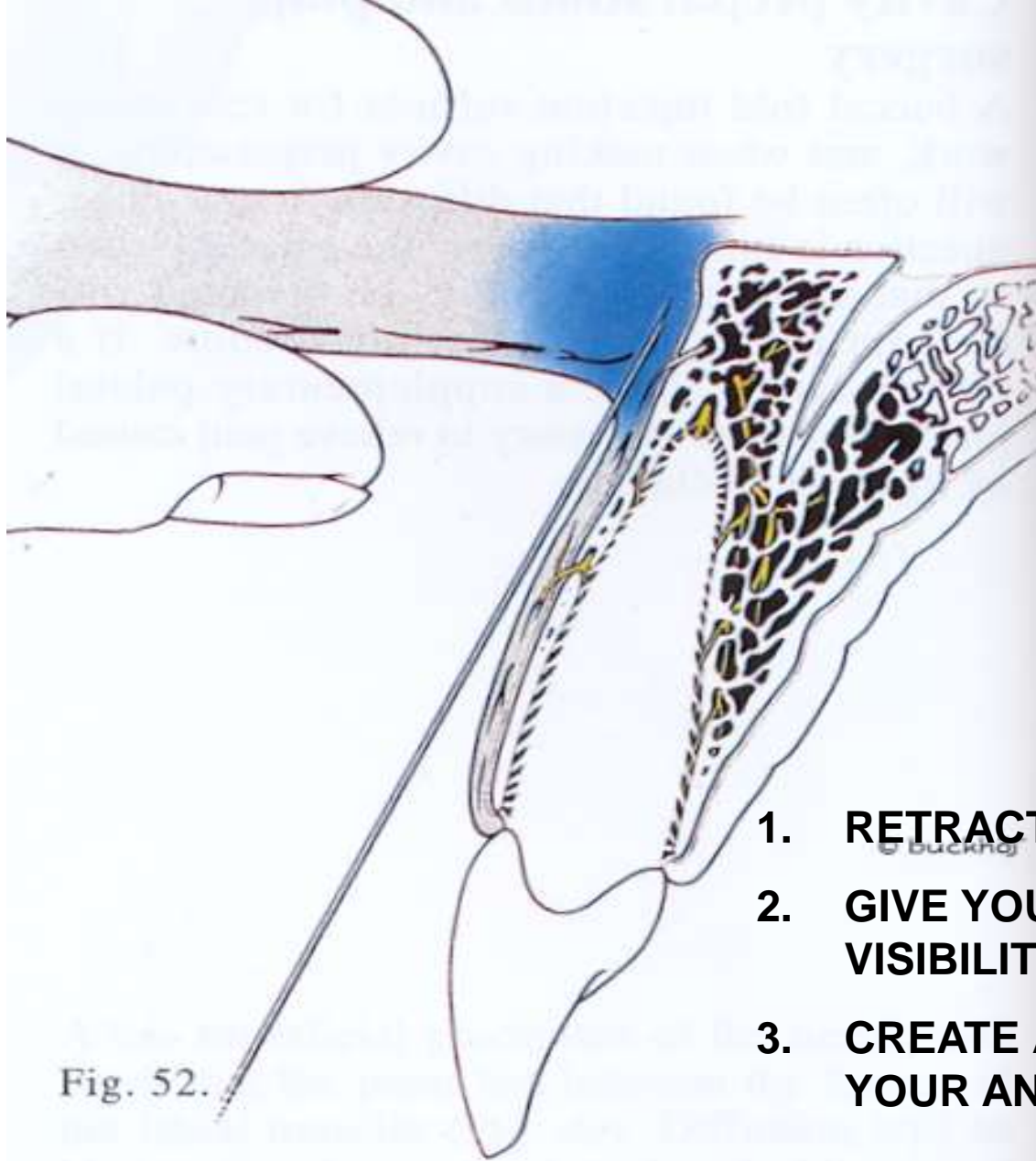


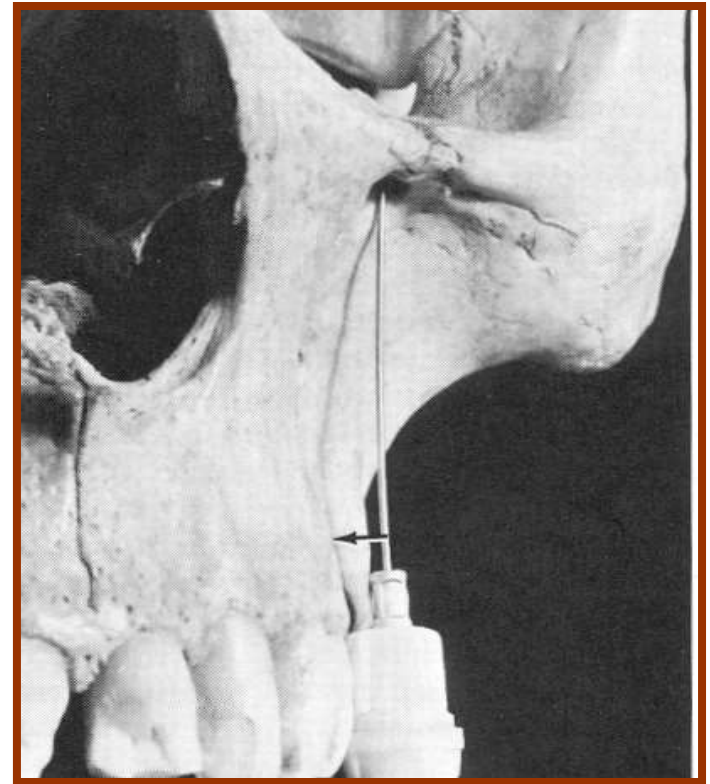
Fig. 52.

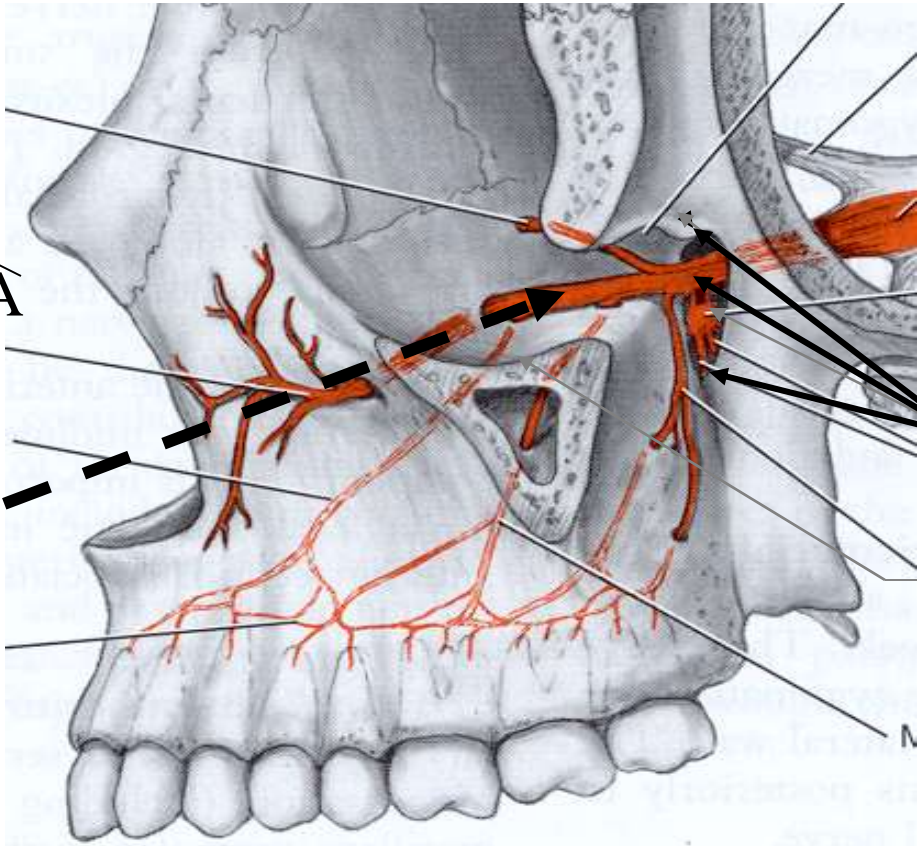
1. **RETRACT LIKE A DENTIST**
2. **GIVE YOURSELF GOOD VISIBILITY**
3. **CREATE A SPACE FOR YOUR ANESTHETIC**



# Infraorbital Nerve Block

- If the operator injects some anesthetic solution such that it enters the infraorbital foramen. The anesthetic will travel up the infraorbital canal far enough to reach the ASA *before it branches from the nerve*





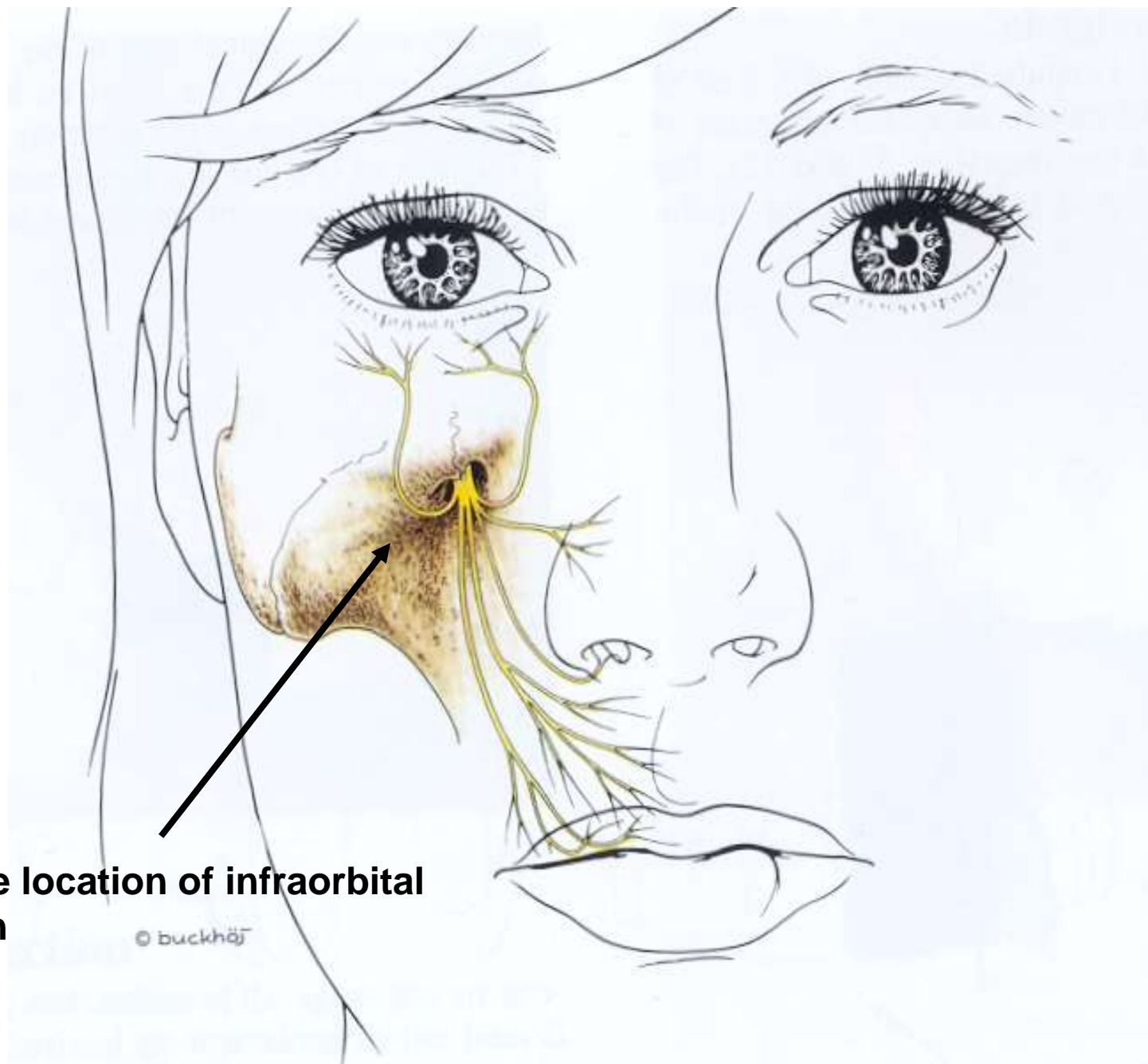
We can.

ASA

PSA

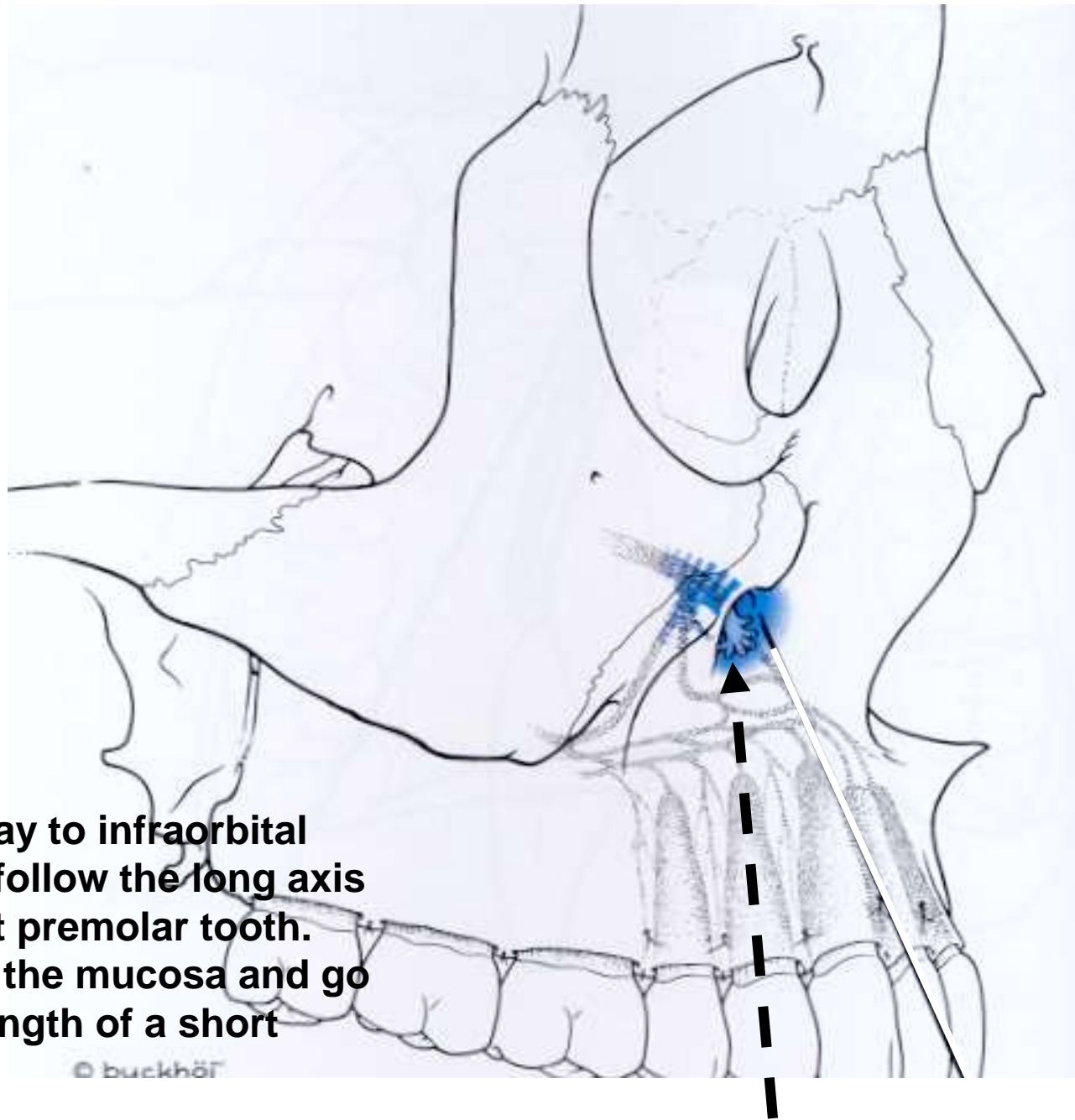
MSA

Path of Anesthetic



**Note the location of infraorbital foramen**

© buckhøj



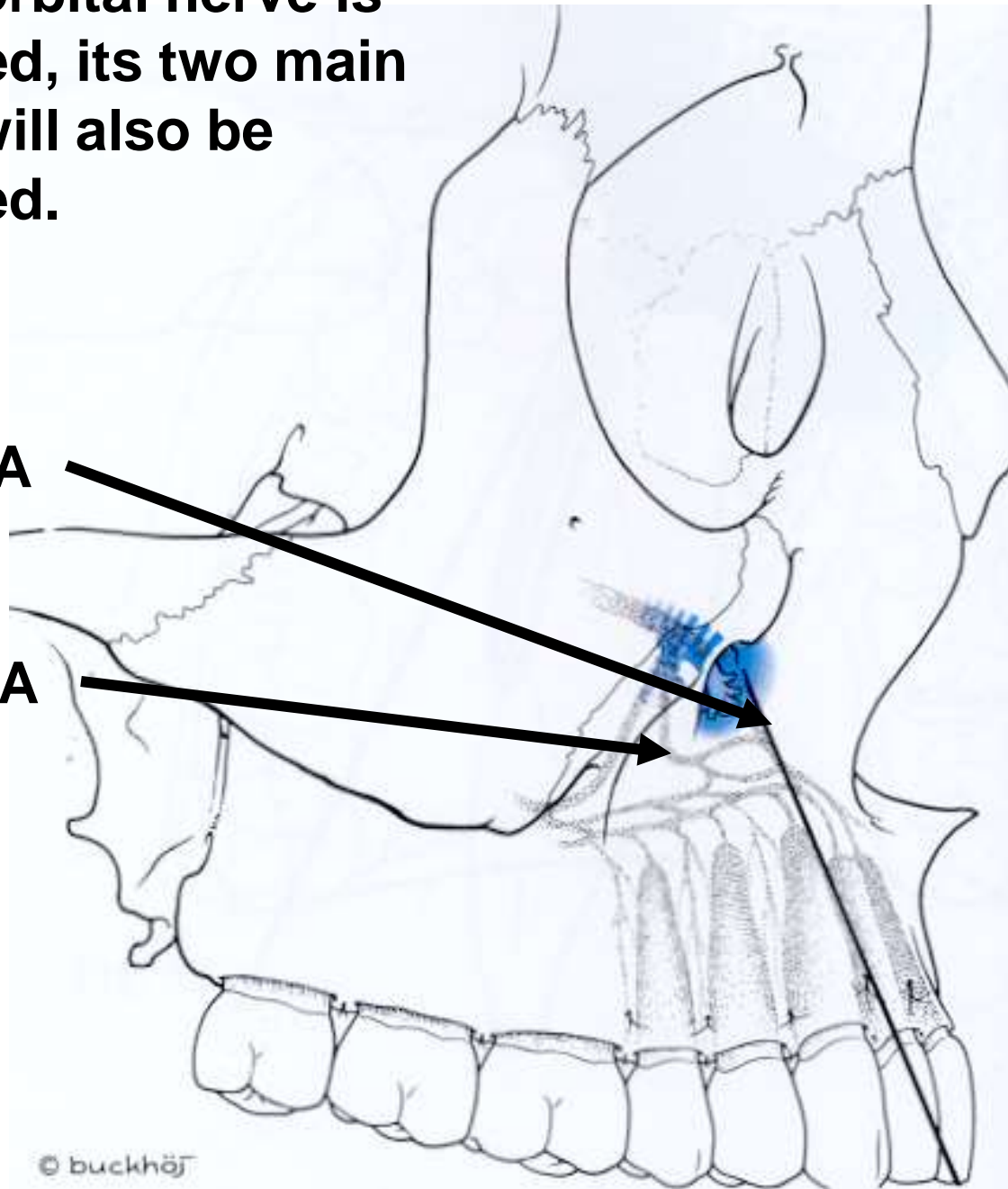
**Easiest way to infraorbital foramen: follow the long axis of the first premolar tooth. Penetrate the mucosa and go half the length of a short needle.**

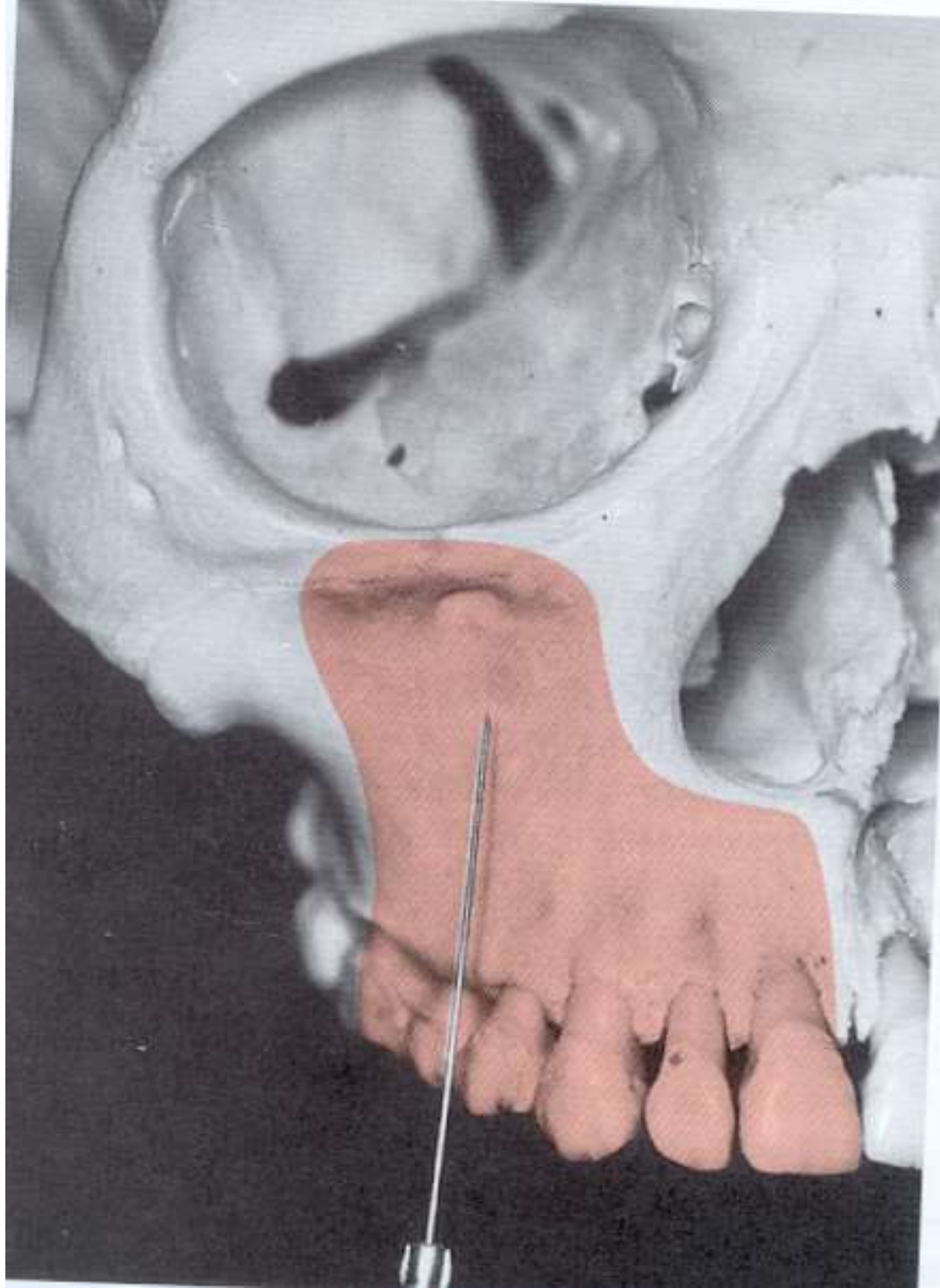


**If the infraorbital nerve is anesthetized, its two main branches will also be anesthetized.**

**ASA**

**MSA**

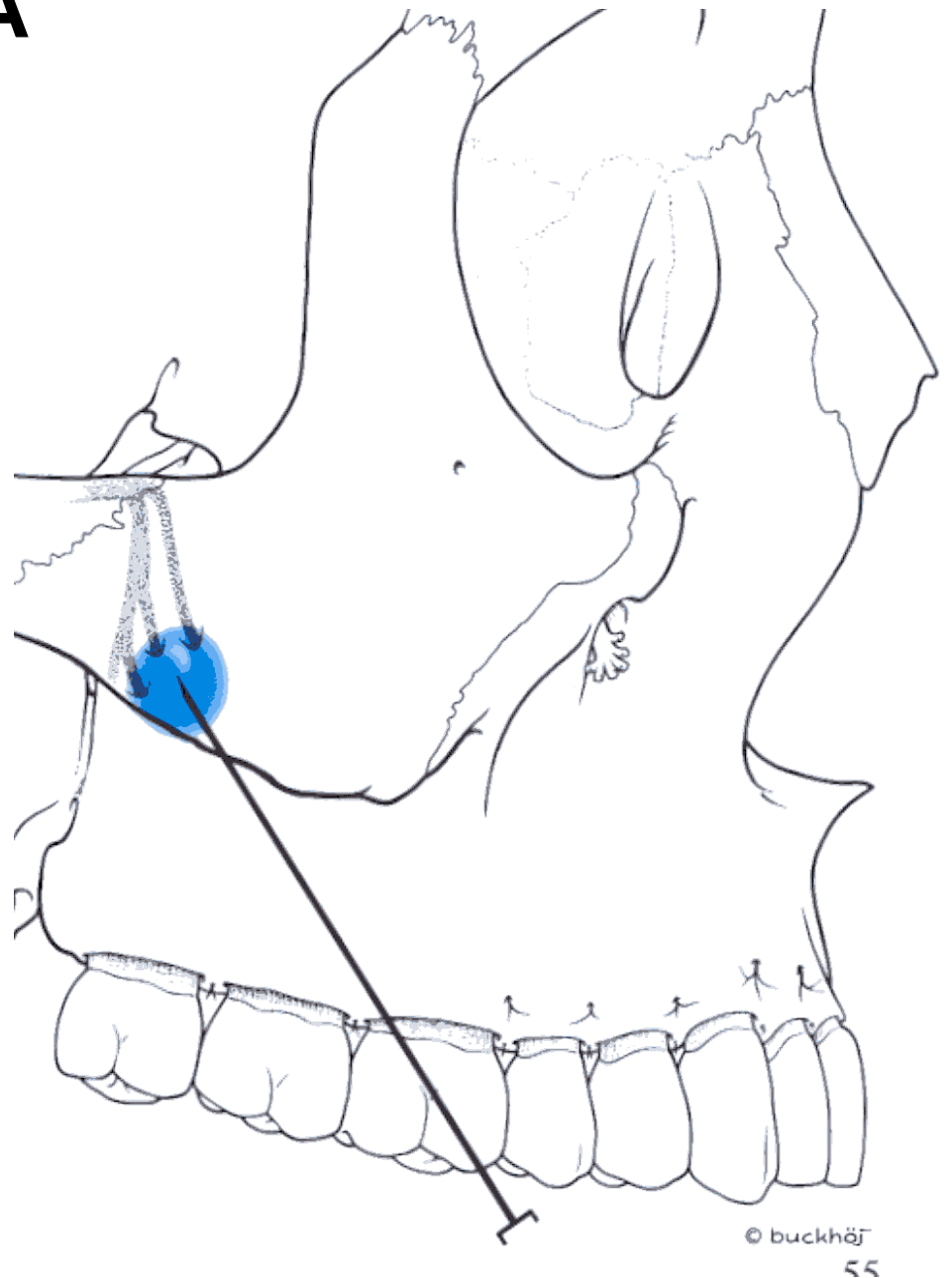




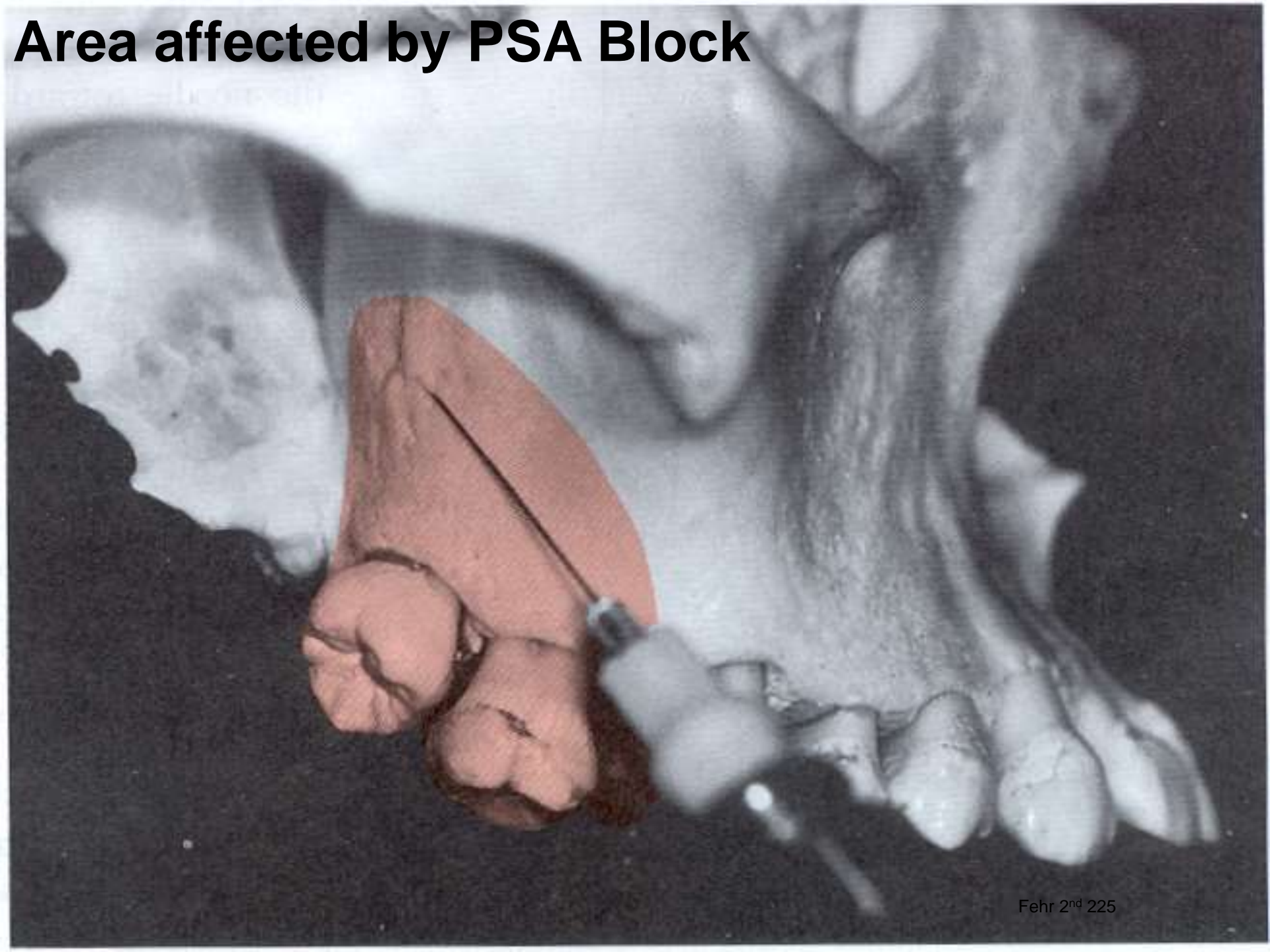
# Anesthetizing the PSA

Anatomical References  
PSA Nerve Block:

- The **posterior superior alveolar (PSA) nerve** enters the backside of the **maxillary tuberosity**. The spot where it enters appears as a rough area on a skull.



# Area affected by PSA Block

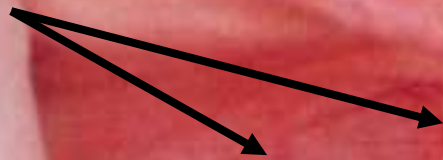




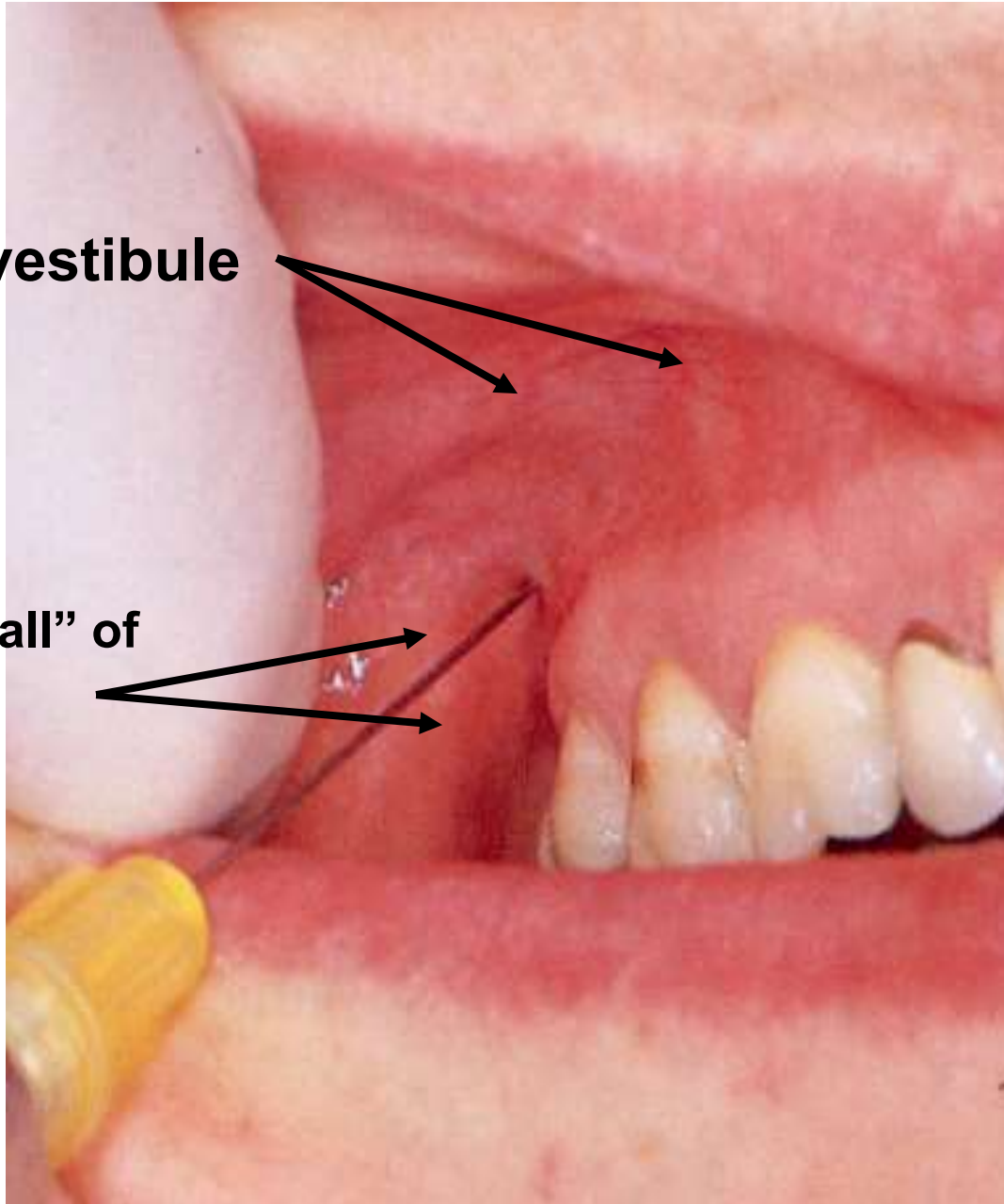
# How is This Block Accomplished?

- The maxillary tuberosity is easily palpated.
- The anesthetic needle is inserted diagonally, (upward, inward & backward), allowing the needle tip to approach the posterior surface of the maxillary tuberosity.

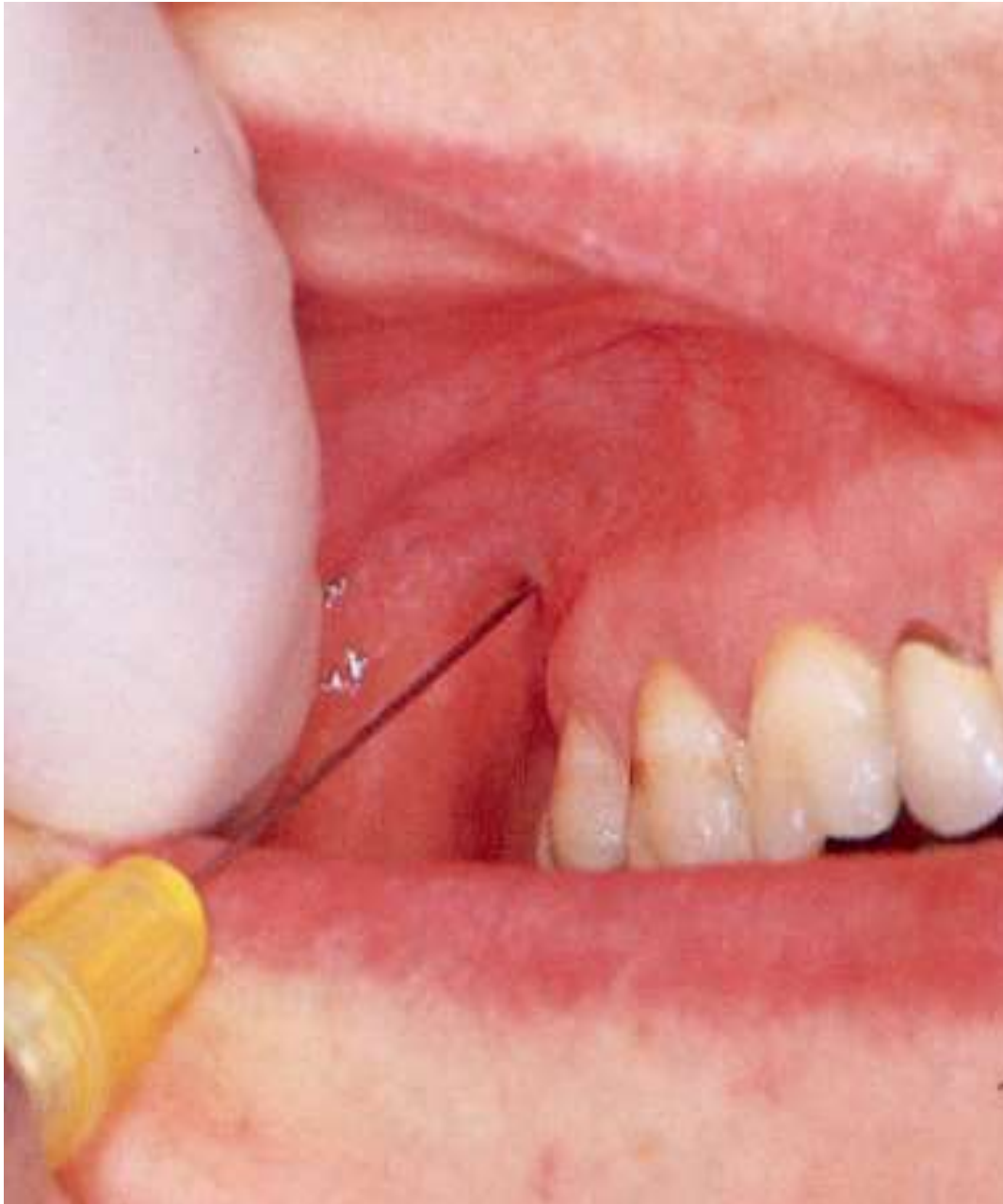
**“Roof” of vestibule**



**“Posterior Wall” of vestibule**



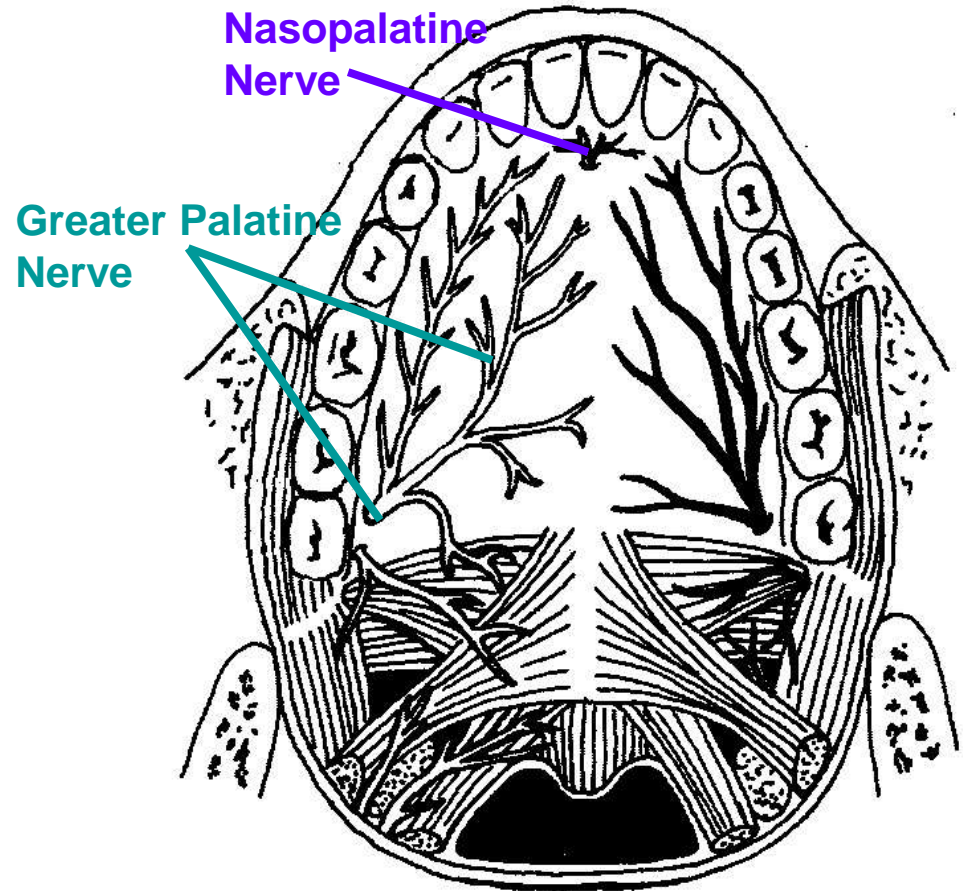
**The operator must swing the barrel of the syringe farther laterally than she wants to. Injection site is the “corner” where the “roof” of the vestibule meets the “posterior wall” of the vestibule.**



**Be sure to point the needle far enough posteriorly to “get around the corner” behind the maxillary tuberosity.**

# Palatal Soft Tissue

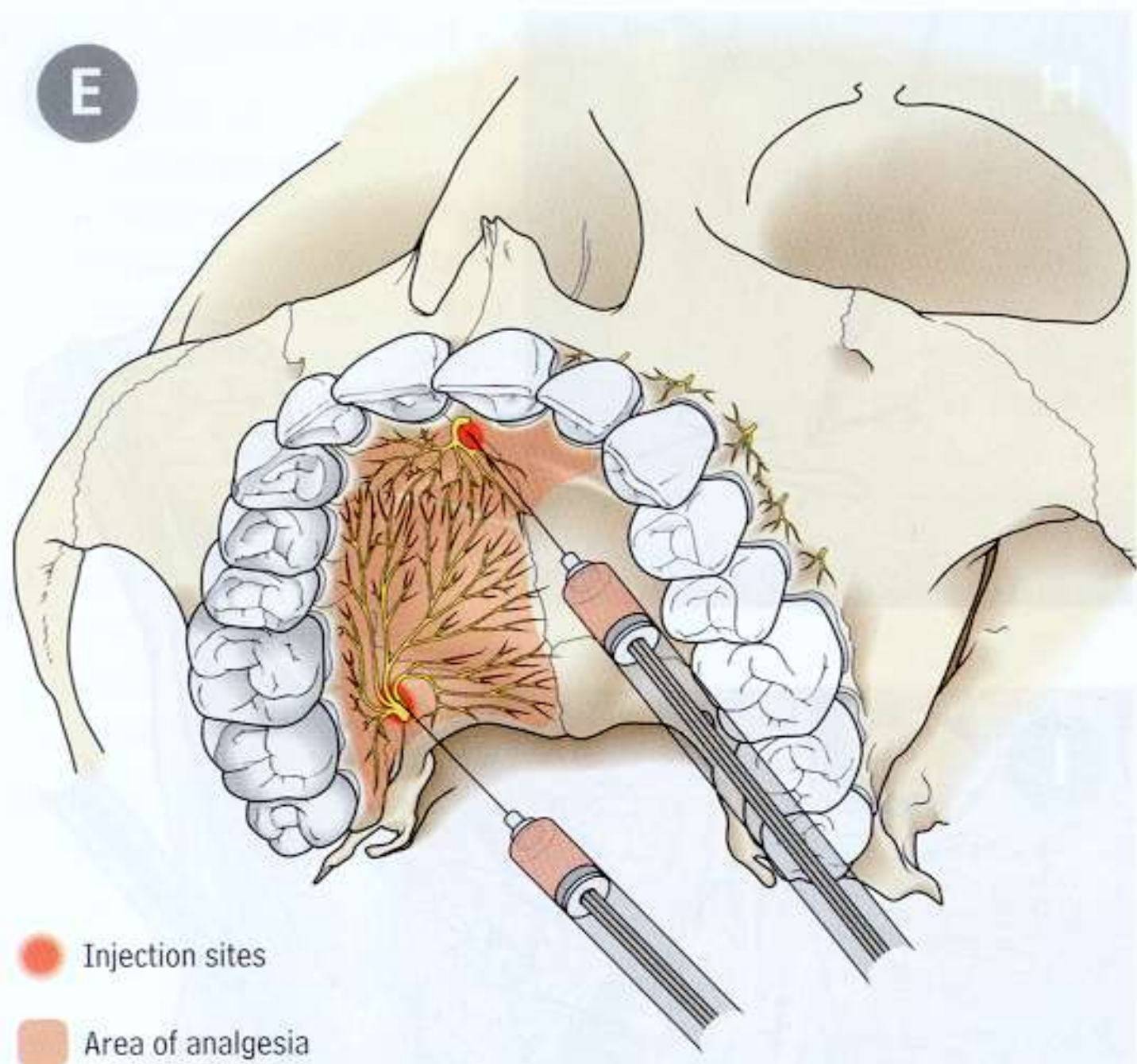
- The palate is innervated by nerves entering at both the **back** of the palate, and the **front** of the palate.
- There is a great deal of overlap between the two sources of innervation.



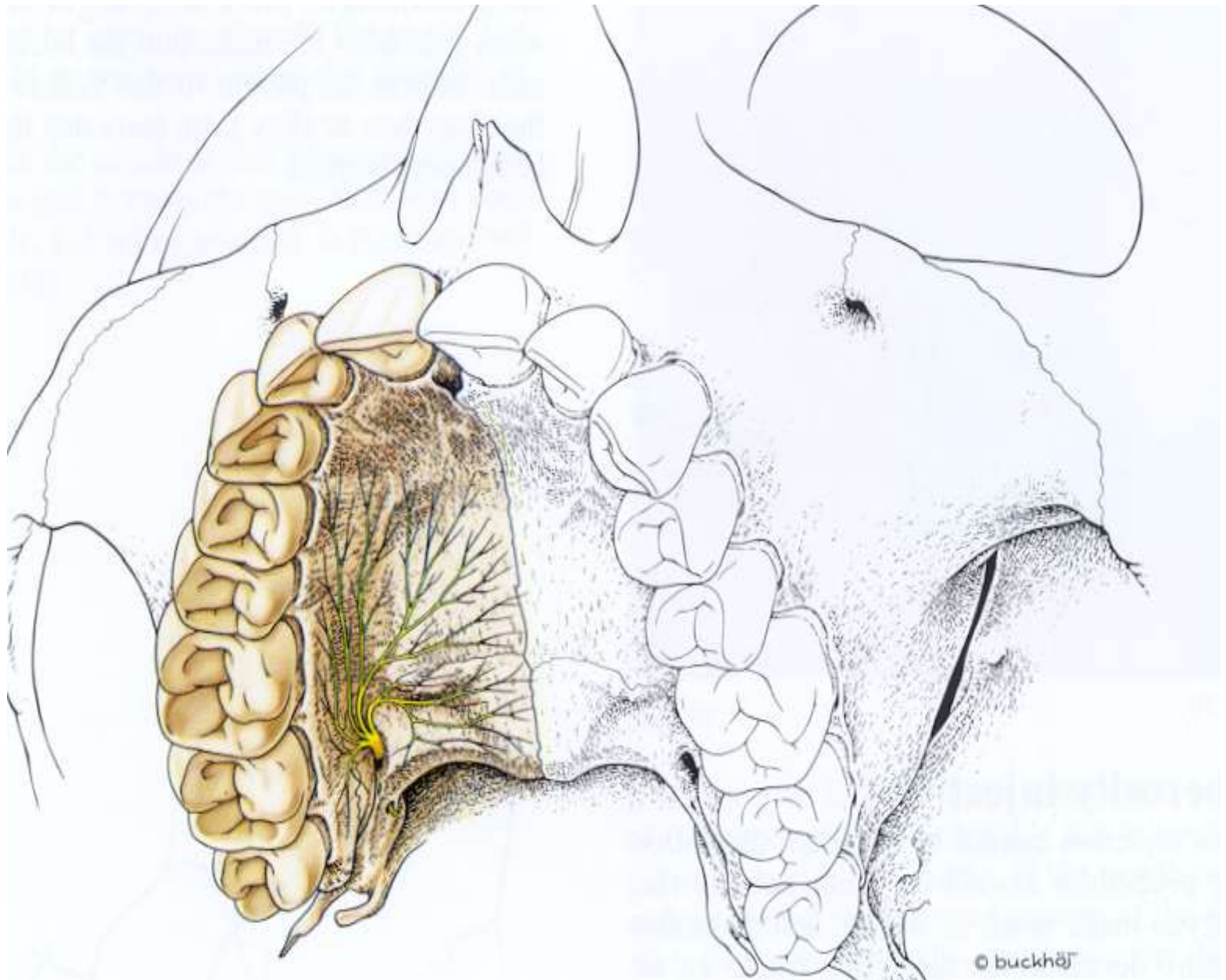
Note that overlap of these two sources occurs in the canine region.



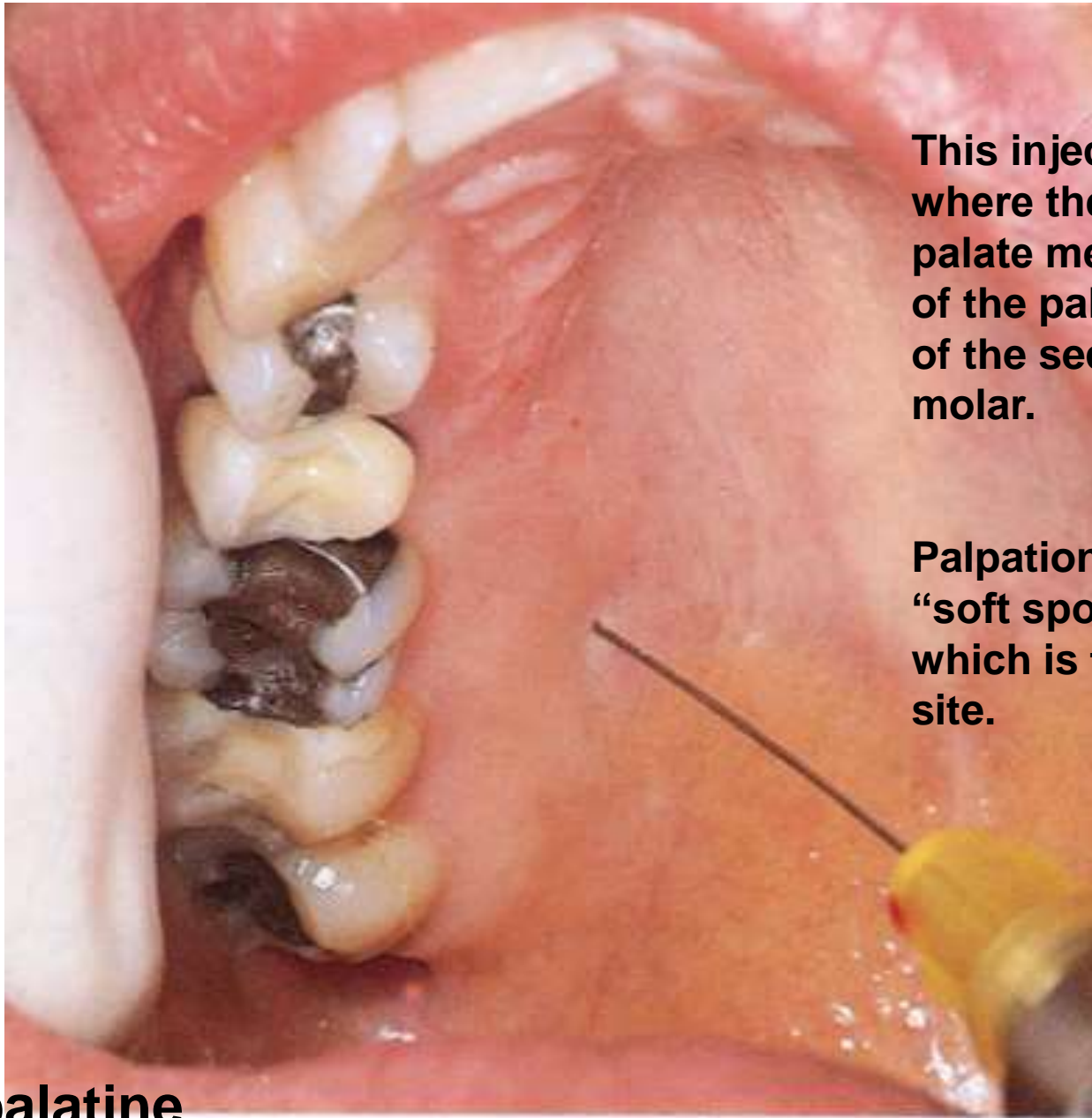
E



- Injection sites
- Area of analgesia



**Note the distribution of the Greater Palatine Nerve**



**This injection is placed where the “roof” of the palate meets the “wall” of the palate, at the level of the second or third molar.**

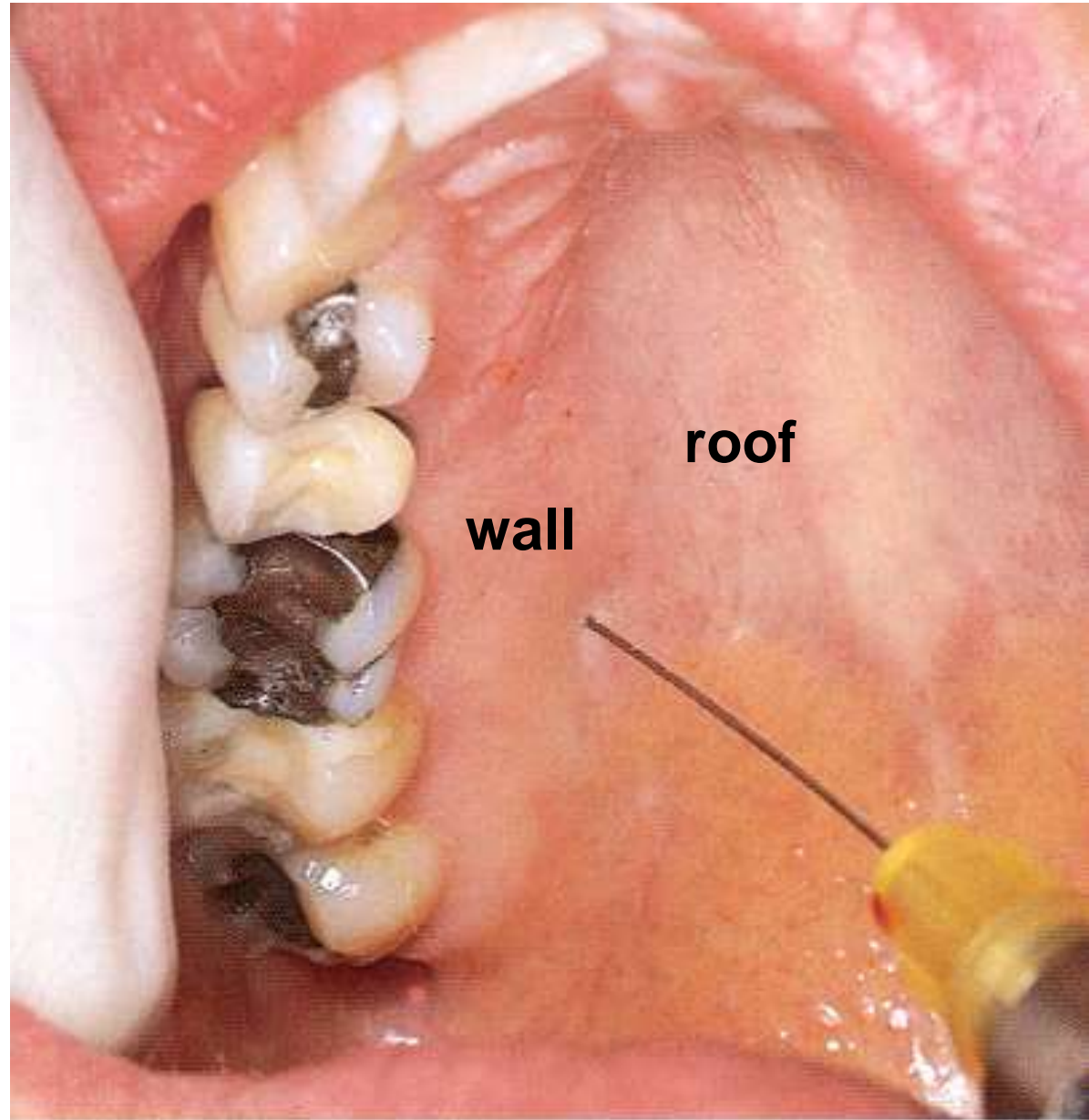
**Palpation will reveal a “soft spot” in this area, which is the injection site.**

**Greater palatine  
nerve injection**



**Injection site for  
greater palatine  
nerve block:**

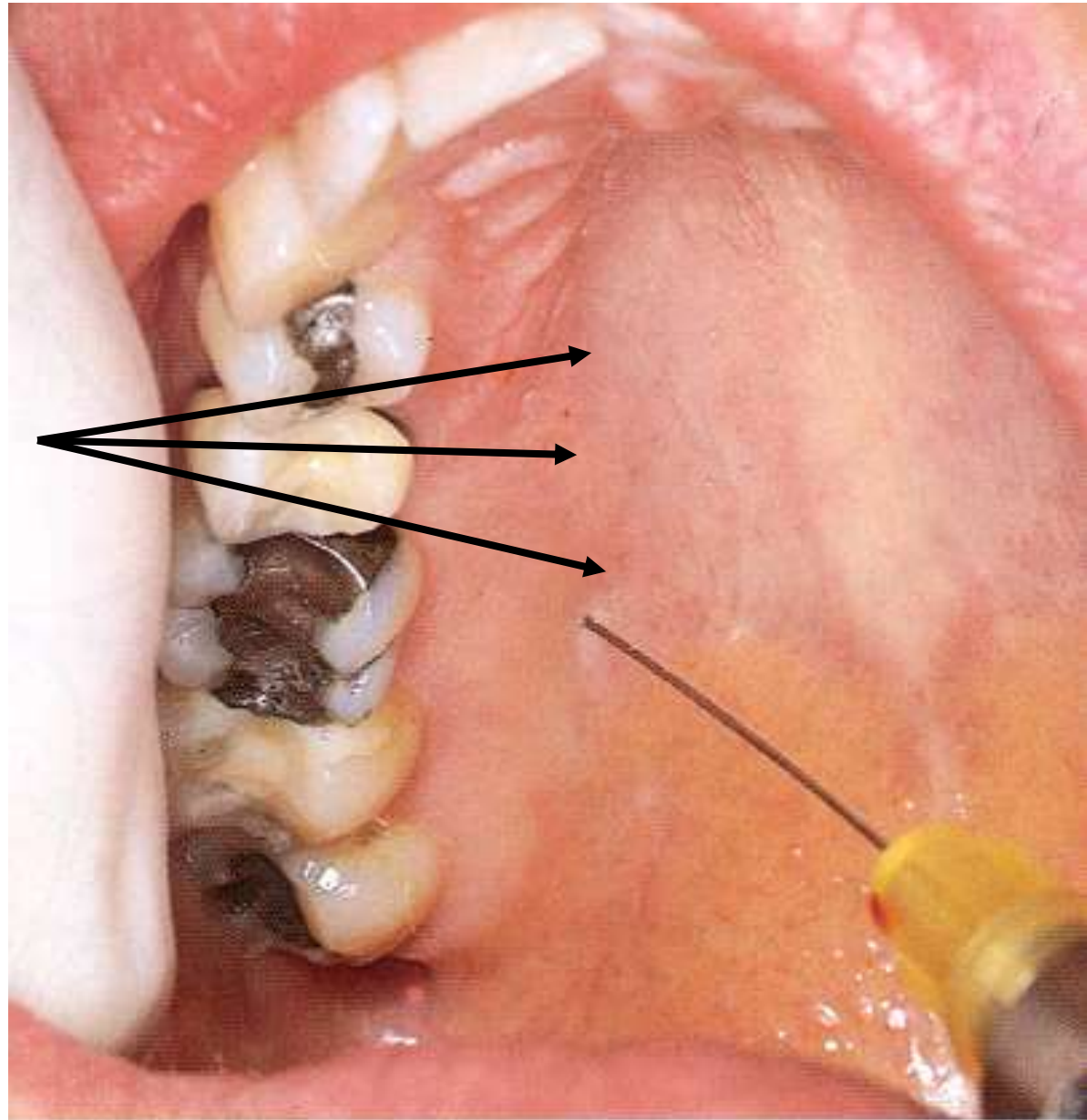
**Where the “roof” of  
the palate meets the  
“wall” of the palate,  
just lingual to the  
maxillary second  
molar tooth.**





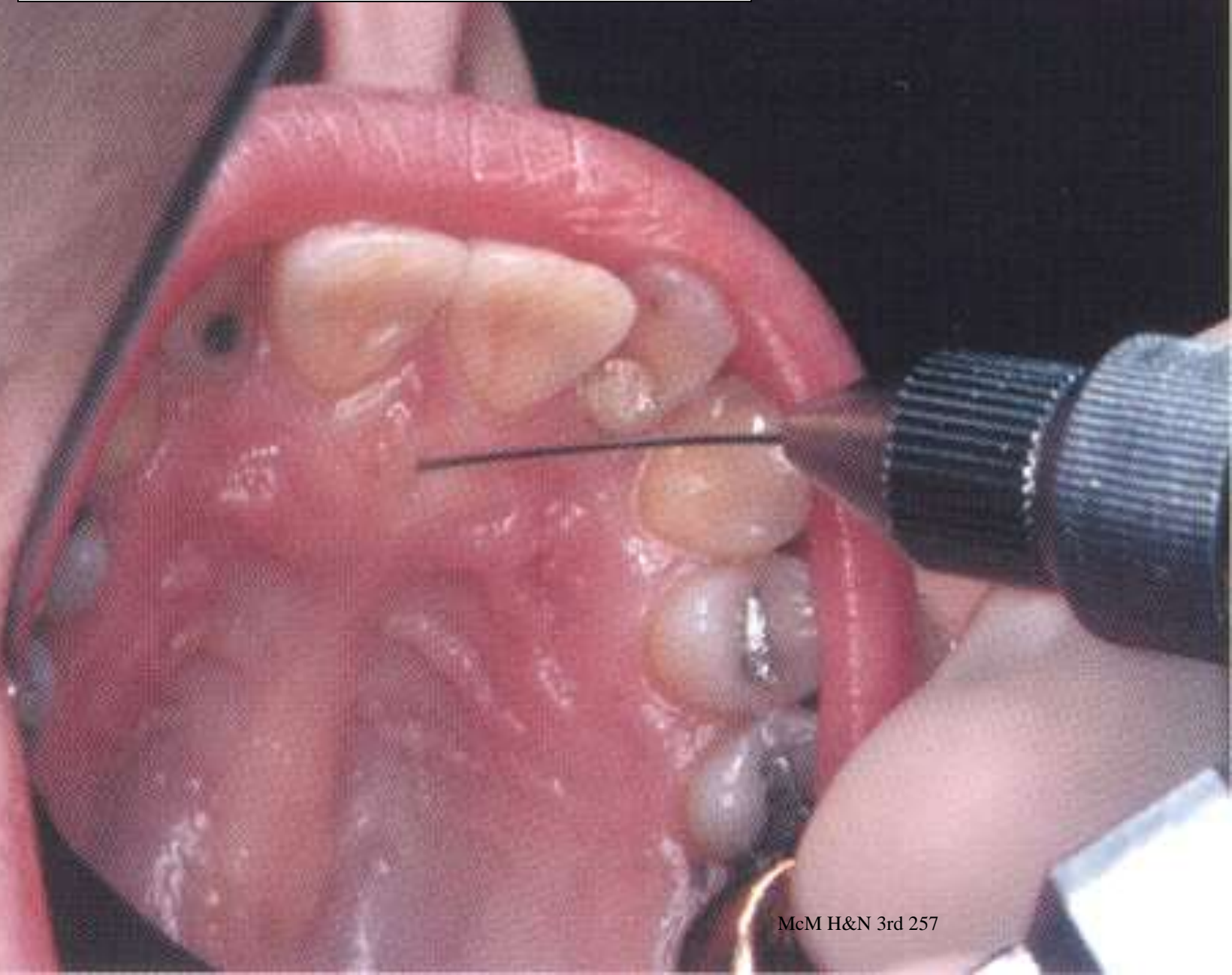
**Even in infiltrating, it's best to inject into the corner between the wall and roof of the palate.**

The corner



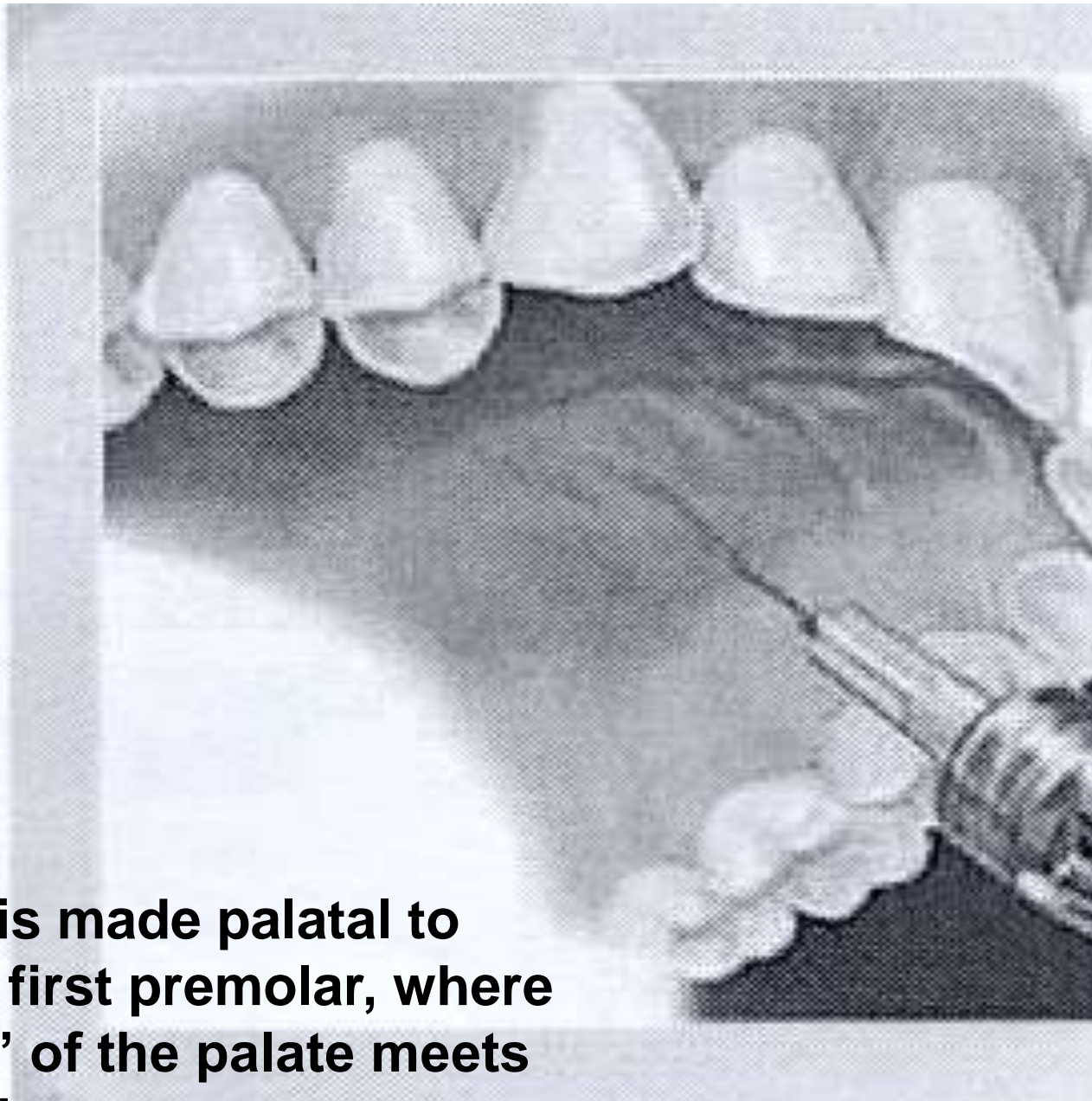
# The nasopalatine nerve block

F



# The Anterior Middle Superior Alveolar (AMSA) Injection

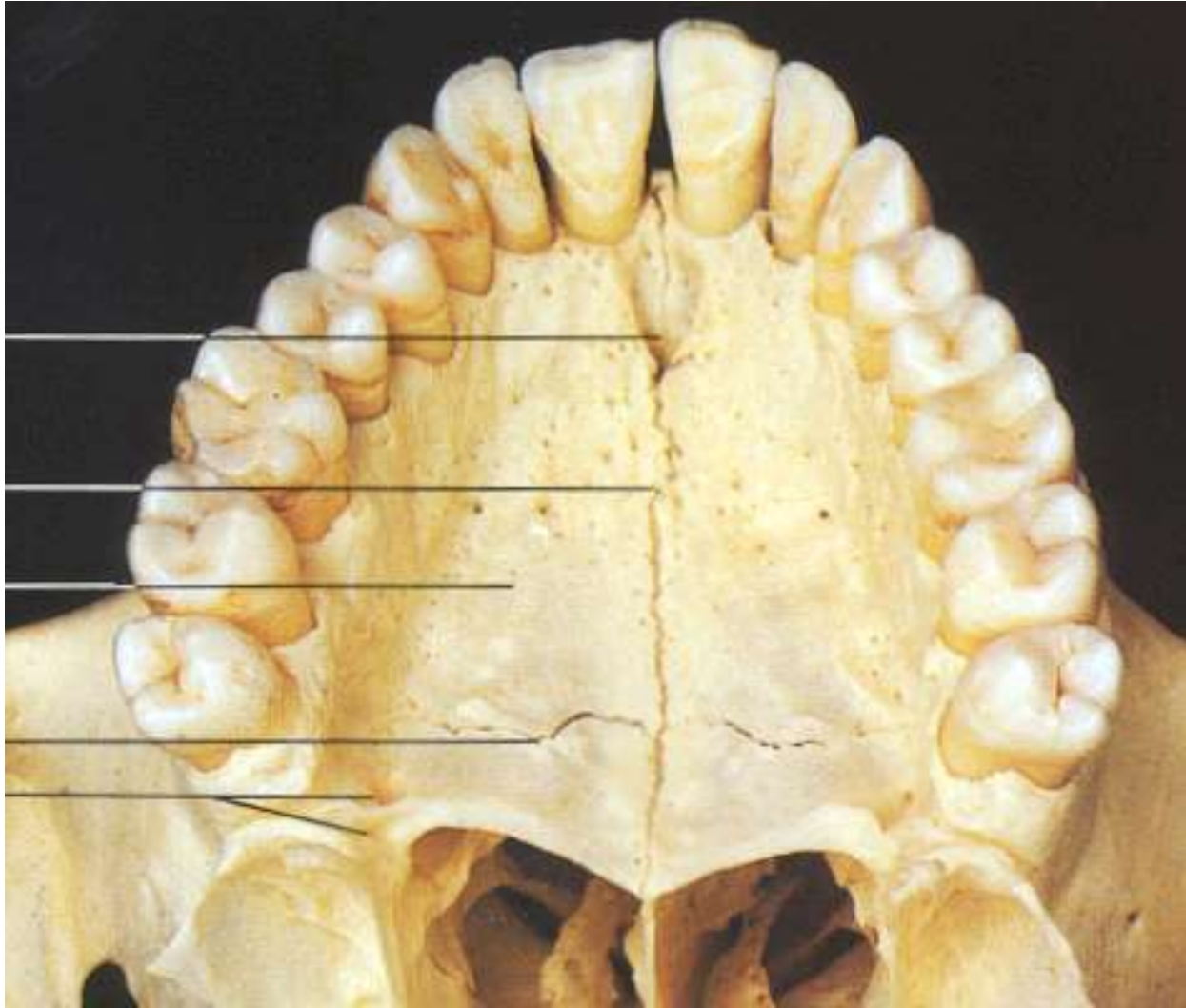
- A new, single-site palatal injection
- Anesthetizes from second premolar to central incisor, palatal and pulpal
- No collateral numbness to patient's lip and face
- Excellent for operative procedures where position of smile line is important.



**Injection is made palatal to maxillary first premolar, where the “roof” of the palate meets the “wall”.**

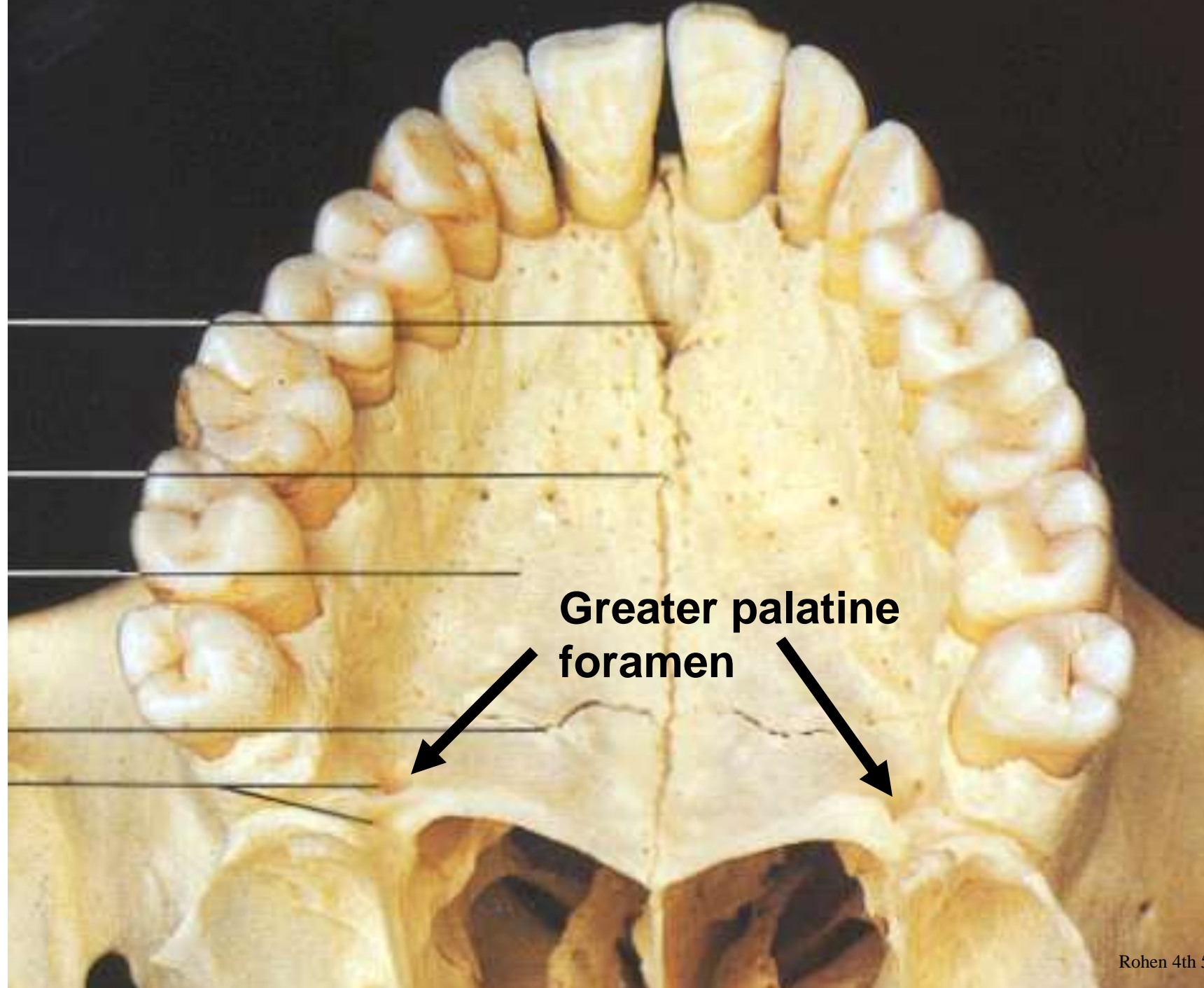


Note the porosity of the palatal bone in that area



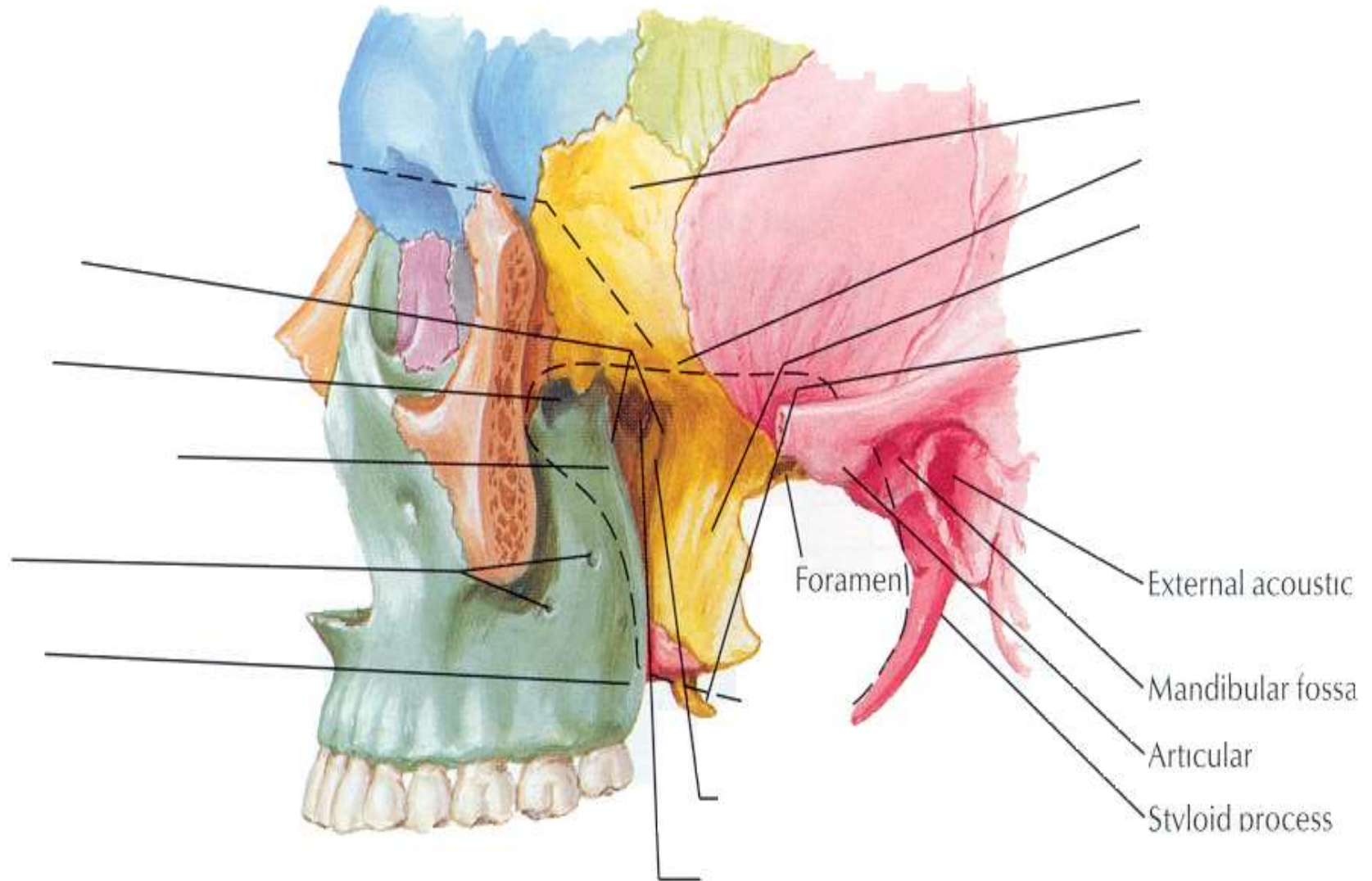
- **AMSA injection will give palatal soft tissue anesthesia, and pulpal anesthesia to premolars and anterior teeth.**
- **It will not anesthetize buccal or labial soft tissue.**
- **This can be advantageous when the natural “lip line” is important.**

# **Maxillary Division Block**



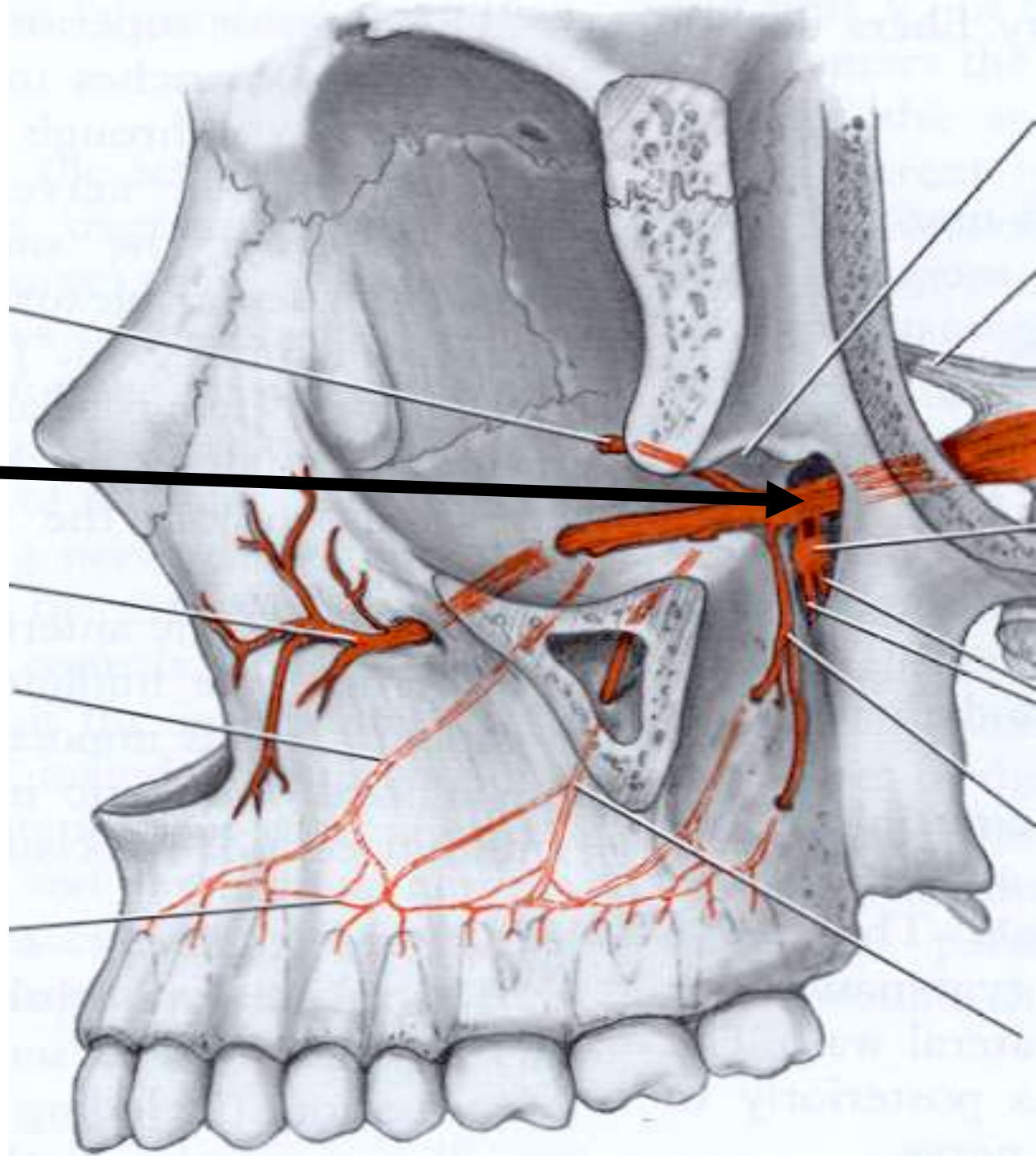
**Greater palatine foramen**





**Greater palatine foramen leads to pterygopalatine fossa, with maxillary nerve inside**

**Pterygopalatine  
fossa,  
containing  
maxillary nerve,  
which brings  
sensory  
innervation to  
structures  
above the plane  
of occlusion of  
the teeth**



# Maxillary Division Block

- What would be the effect if we injected local anesthetic into the pterygopalatine fossa?
- All the structures served by maxillary nerve on that side would be anesthetized.

