A new method of maxillary anesthesia

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**professional training evaluation**

1. Topical anesthesia is essential before an injection into the palatal mucosa.
   - D True   D False

2. Maxillary anesthesia can be achieved using only three injection points.
   - D True   D False

3. Latency of transcortical palatal anesthesia is identical to that of vestibular infiltration anesthesia
   - D True   D False

4. Transcortical anesthesia via the palatine route requires a vestibular injection.
   - D True   D False

5. In the jawbone, the vestibular cortical is less deep than the palatal cortical.
   - D True   D False

Maxillary anesthesia is not the type of anesthesia that presents the most difficulty. Traditionally, it involves a para-apical injection of a cartridge of anesthetic into the vestibular. This injection enables anesthesia of two teeth with numbing of the surrounding soft tissues. It is sometimes carried out with palatal anesthesia when there is a prolapsed sinus involved and, systematically, for an extraction.

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Transcortical or intradiploic anesthesia applied to the jawbone brings certain benefits compared to traditional infiltration anesthesia: it is immediate, does not involve anesthesia of the surrounding soft tissues, regularly eliminates the need for supplementary palatal anesthesia, even for an extraction, and enables six teeth to be anesthetised with one single injection.

The possibility to anesthetise six teeth with one single injection reduces maxillary anesthesia to three preferred points. These are: the interincisor point and the points located between the first molar and the second premolar on the right and left.

The interincisor point does not present any major difficulty and enables anesthesia of the entire incisor-canine block.

The injection point located between the second upper premolar and the first molar sometimes presents difficulties due to radicular proximity or a labial commissure that cannot be extended, limiting access.

• Anatomical study of this interdental space enables us to resolve these two difficulties.

Study of the osseous space located between the upper first molar and the second premolar

In order to simplify the denomination of this space located between the teeth numbered 5 and 6, we will call it 5-6. First, we must look at the width of the palatal cortical. We can see, on the cross-sections of dried bone, below, that the two corticals, vestibular and palatal, are of approximately the same width. Therefore, no particular technical difficulties are to be expected as far as crossing the palatal cortical is concerned (fig. 1 to 6).

1 to 6. The vertical cross-sections of the 5-6 spaces show that the vestibular and palatal corticals are of comparable width.
Sometimes, an x-ray of 5-6 shows a very limited space between the two vestibular roots, where the two alveolar corticals may be next to each other, preventing any intraosseous injection (fig. 7). Observation of the coronal cross-sections of the 5-6 space along with the occlusal plan, 2 mm above the neck, shows, in the occlusal view, a more significant width in the palatine than in the vestibular. This is due to the fact that in the vestibular space there are two roots and in the palatine space there is only one root for the molar. The 5-6 space is therefore wider on the palatine side than the vestibular. This analysis is also valid for the palatine space located between the first and second molars.

On the cross-sections carried out on dried bone (fig. 8, 9 and 10) and on the scanners (fig. 11 and 12), one can see that the osseous space located between the palatine root of the six-year molar and the palatine root of the second premolar is always larger than the space located between the mesio-vestibular root of the six-year molar and the root of the second upper premolar. Injection into this space using the palatine access would therefore appear to be more sensible.
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How is a Painless Palatal Anesthesia Performed?

Palatal anesthesia is unanimously recognised as painful (1).

For several years, however, it was offered with use of an electronically-assisted injection system, the Wand (1). Assisted injection is an effective contributing factor in pain reduction during an injection, if only because the configuration of the profile of the injection is well thought-out. The other factor, equally significant, is the perfect positioning of the bevel of the needle in relation to the mucosa (2). This should be placed flat against the mucosa in order to reduce the depth of penetration while at the same time allowing the injection to be carried out. The general angulation of the needle in relation to the mucosa should be around 15° to 20°.

Painless palatal anesthesia, without topical anesthetic or any other trick (mirror arm, cotton bud, pressure with the nail, etc.) is possible using a system characterised by electronically-controlled injection and above all the use of a "pen" grip that ensures precision of the angle and control of the penetration of the needle.

Conclusion

Although anesthesia of the maxillary teeth is not the practitioner's primary problem, it is worth recognising that transcortical anesthesia using the palatine route contributes to an increase in comfort for the patient, while at the same time enabling an appreciable amount of time to be saved and a higher level of effectiveness for the practitioner.

Important elements to bear in mind from this study are the following:

absence of pain during this type of anesthesia;

total absence of necrosis of the mucosa or the bone, regardless of the type of anesthetic used;

the possibility, for the practitioner, of treating one or more teeth (up to six) in the same session, without the patient having to undergo anesthesia of the soft tissues;

a reduction in average quantities injected and therefore a reduction in the toxicity of the anesthesia.

This new way of intra-osseous injection resolves the difficulties posed by interradicular osseous spaces of limited width, whether or not they are associated with a narrow mouth.

Discussion

Although painful palatal injection is no longer a problem as we have just seen, the possibility that necrosis may appear should not be disregarded.

Palatal necrosis is generated by the conjunction of two factors: one chemical, the other mechanical.

The chemical factor is the vasoconstrictor contained in the solution, which brings about the closure, to a greater or lesser extent, of the blood vessels, for a variable duration; the extent of the closure and the duration being a function of the concentration of the vasoconstrictor within the solution.

The mechanical factor, which is without doubt the most important, is the crushing of the capillaries by the liquid injected into a non-deformable mucosa. This factor is a direct function of the quantity injected.

To avoid this risk, the practitioner should therefore be sure that the injection is carried out well into the intra-osseous space and not into the sub-mucosa.

This is the only factor to which the practitioner should give all of his or her attention.


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