

## 9

# The Use of Anesthesia in Endodontics

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In achieving the elimination of pain during dental procedures, and in particular endodontic therapies of vital teeth, it is necessary to use anesthetic solutions. By blocking the transmission of nerve impulses, they make it possible to carry out such therapies by putting the patient at ease and thus permitting the dentist to operate optimally.

Very frequently, the patient anticipates endodontic treatment with great anxiety. What is most frightening is the fear of experiencing pain. It is the dentist's responsibility to calm the patient and elicit the maximal cooperation by successful anesthesia. Nonetheless, one must not abuse anesthetics as tranquillizers. If the planned treatment is definitely painless, such as the cleaning and shaping of a necrotic root canal or the filling procedure of a canal, it is perfectly useless, if not in fact contraindicated, to administer anesthetics. There are several reasons for this. In the case of the necrotic tooth, the preparation of the access cavity corresponds to the very important "cavity test", and if one is working under anesthesia, one may realize too late that a lesion that originally seemed to be of endodontic origin was rather of periodontal origin, and thus that the pulp was vital. Furthermore, if one uses anesthetics when not indicated, one excludes the admittedly minimal and not always reliable collaboration of the patient.

The dentist has many techniques available for controlling pain: topical anesthesia, local anesthesia, regional anesthesia or nerve blocks, and other so-called supplemental forms of anesthesia.

## TOPICAL ANESTHESIA

Topical anesthesia refers to the topical application of anesthetics for various reasons, such as rendering localized areas of mucosa insensible. The principal means by

which topical anesthesia is administered are liquids, troches, gels (Fig. 9.1), sprays,<sup>41</sup> and cooling<sup>20</sup> (Fig. 9.2). This type of anesthesia is indicated for desensitizing the mucosa to needle pricks, which would be necessary for local infiltration.



Fig. 9.1. An anesthetic gel is applied topically to the mucosa, where it takes effect after 20-30 seconds.



Fig. 9.2. An ice stick achieves anesthesia by cooling the palatal mucosa. This allows painless introduction of the needle.

## LOCAL INFILTRATION

Local infiltration may be defined as a technique by which an anesthetic solution is deposited within the treatment area.<sup>30</sup> This technique permits rapid, efficacious anesthesia for all the maxillary teeth and mandibular incisors. The needle is introduced vestibularly at the mucogingival junction at the level of the affected tooth. A short needle is used to inject at least 2 cc of anesthetic solution into the region of the apices.<sup>33</sup>

Malamed<sup>31</sup> recommends that local anesthesia be performed with a single injection. He suggests depositing the solution above the periostium and then taking advantage of its capacity to diffuse through the periostium itself and the cancellous bone. This blocks the small nerve endings of the affected area. His is therefore a submucosal and suprapariosteal anesthesia (Fig. 9.3). In contrast, Bence<sup>2</sup> recommends that local infiltration be performed in two steps. First, about one-fifth of the anesthetic vial is injected above the periostium, thus anesthetizing this structure. In the second step, the syringe needle is introduced more deeply until it encounters bone, after which it is directed apically, below the periostium, as close as possible to the apex of the tooth being treated. The remainder of the vial is then injected (Fig. 9.4). The anesthetic should be injected slowly and only after the perio-

stium has been anesthetized, because it is painful. The periostium limits the diffusion of the anesthetic; in addition, the resulting compression facilitates the absorption of the anesthetic by the bone.

Complete pulp anesthesia is thus attained in just a few minutes. In the time it requires to place the rubber dam, the degree of anesthesia reaches the desired level.

To anesthetize the nerve fibers that innervate the palatal root of the upper molars or premolars, or any other tooth that has a palatal root, it is advisable to perform a palatal infiltration after the vestibular infiltration (Fig. 9.5). The palatal root is usually closer to the palatal than vestibular cortical bone; thus, a buccal infiltration alone may not suffice.

To perform a palatal infiltration, it is not necessary to reach the periostium. The palatal mucosa is so adherent and thick that it is able to limit the diffusion of the anesthetic and force the solution into the underlying bone, like the periostium of the vestibular side.

Palatal infiltration is quite painful. Therefore, it should be performed slowly by steadily depositing a small amount of anesthetic (0.5 ml) under adequate pressure. Before performing the palatal infiltration, it is advisable to achieve anesthesia of the mucosa, for example by cooling.<sup>20</sup>

As already described in Chapter 8, special precaution is required for infiltration of the mucosa overlying the

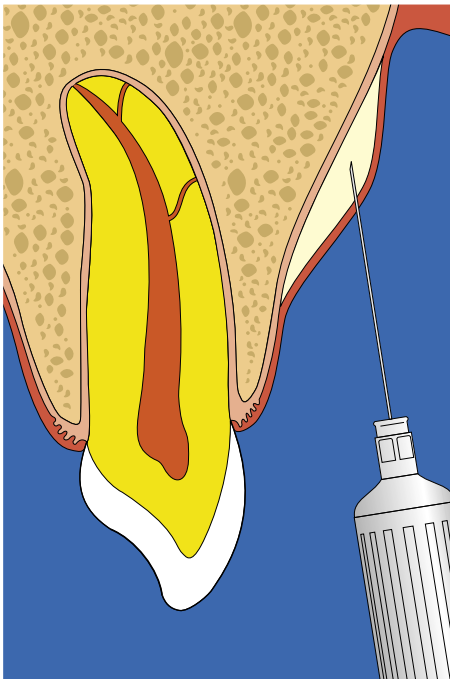


Fig. 9.3. Submucosal and suprapariosteal anesthesia.

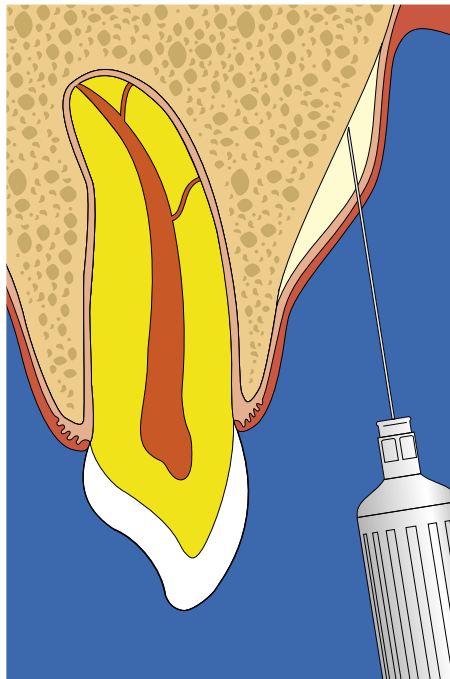


Fig. 9.4. Subperiosteal anesthesia.

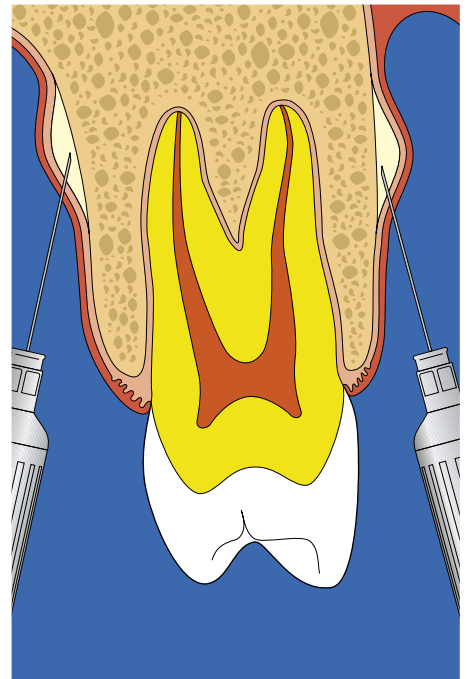


Fig. 9.5. Teeth with palatal roots require a palatal infiltration too.