

Overcoming the failure of anesthesia in the mandibular teeth

Giath Gazal, PhD.

Although the huge progresses in the world of local anesthetic agents and the instruments of injections, failure of anesthesia following the inferior alveolar nerve block is still to occur on dental chair. In recent years, the failure rate of inferior alveolar nerve blocks (IANB) has reached the highest level of 30%.¹ This fact gives a warning to practitioners to search for other supplementary techniques in order to overcome this dilemma. In the literature, there were a number of publications which reported the causes of anesthetic failure in the mandible after the IANB.¹⁻⁵ The most common factor was the diversity of the anatomic structure of the mandible bone amongst the patients.¹ Angle of divergence between the body and the ramus of mandible, size and degree of projection of lingula (lingula [spix spine] is a triangular bony projection on the medial surface of the ramus of the mandible, sheltering the entrance of the mandibular foramen), and patient's age play the main role in the success of IANB.² Changes in these anatomical landmarks will result in insertion the needle of injection in the wrong site and deposition the local anesthetic solution either faraway posterior or premature anterior.⁵ The routine practice following the failure of the IANB is to administrate an extra local anesthetic (4% articaine or 2% lidocaine) cartridge by using buccal infiltration techniques.² However, recent studies by Flanagan³ and Kim et al⁴ reported that articaine buccal infiltration can be a substitute injection for IANB in posterior mandibular teeth on condition that the thickness of buccal cortical plate must be less than 3 mm. So, 2-3 mm is a cutoff point for successful anesthesia in mandible posterior infiltration.³

In light of these facts, it can be argued that the first choice for anesthetizing the mandibular teeth is the IANB technique but if this technique fails because the diversity or missing the anatomical land marks then we can use the 4% articaine buccal infiltration technique

as a second choice. However, the success of buccal infiltration technique depends on the thickness of buccal cortical plate. If the thickness of buccal cortical plate is more than 3 mm the infiltration technique will fail as well.

Consequently, the failure of mandibular anesthetic IANB and the buccal infiltration techniques can be overcome by using the final option which is the intraseptal anesthesia technique. The principle of this uncomplicated technique bases on the insertion of the bevel of the short needle of the dental syringe in the mesial and distal intraseptal bone of the subject tooth.⁵ This means reduction in the thickness of the buccal cortical plate which will result in shortening the distance of diffusion and speed up the onset time of anesthesia.

In conclusion, the use of 4% articaine buccal infiltration technique can be a good choice for overcoming the failure of anesthesia in the mandibular teeth following the IANB as long as the buccal cortical plate is less than 3 mm. However, intraseptal anesthesia technique has shown unconditional success for use in the mandibular teeth.

References

1. Sawadogo A, Coulibaly M, Quilodran C, Bationo R, Konsem T, Ella B. Success rate of first attempt 4% articaine para-apical anesthesia for the extraction of mandibular wisdom teeth. *J Stomatol Oral Maxillofac Surg* 2018; 119: 486-488.
2. Rayati F, Noruziha A, Jabbarian R. Efficacy of buccal infiltration anesthesia with articaine for extraction of mandibular molars: a clinical trial. *Br J Oral Maxillofac Surg* 2018; 56: 607-610.
3. Flanagan DF. The effectiveness of articaine in mandibular facial infiltrations. *Local Reg Anesth* 2016; 9: 1-6.
4. Kim C, Hwang KG, Park CJ. Local anesthesia for mandibular third molar extraction. *J Dent Anesth Pain Med* 2018; 18: 287-294.
5. Gazal G, Fareed WM, Zafar MS. Role of intraseptal anesthesia for pain-free dental treatment. *Saudi J Anaesth* 2016; 10: 81-86.

From the Department of Oral and Maxillofacial Surgery, Taibah University, Al Madinah Al Munawwarah, Kingdom of Saudi Arabia.

Address correspondence and reprint request to: Dr. Giath Gazal, Department of Oral and Maxillofacial, Taibah University, Al Madinah Al Munawwarah, Kingdom of Saudi Arabia. E-mail: gazal73@yahoo.co.uk

ORCID ID: <https://orcid.org/0000-0003-1434-0703>