

Efficacy Of Extra-Oral Inferior Alveolar Nerve Block In Mandibular Teeth Extraction

ABSTRACT

Objective: To determine the effectiveness of Extra oral inferior alveolar nerve block technique in terms of pain during injection, onset of anesthesia and pain during extraction of mandibular teeth.

Methodology: This cross sectional study was carried out at Oral & Maxillo-facial Surgery, Institute of Dentistry, Liaquat University of Medical & Health Sciences Jamshoro / Hyderabad, from May 2018 to November 2018. All patients with age of 18-45 years regardless of gender and having sub-mucous fibrosis were included. Affected teeth were diagnosed via clinical examination, peri apical and Orthopantomogram radiographs. Mandibular teeth were anesthetised by extra oral inferior alveolar nerve block. Visual analog scale was used to record severity of the pain during the injection of anesthesia and during the extraction. Onset of the anesthesia was recorded in minutes. Data was documented via self-made proforma and analyzed by SPSS 20 version.

Results: Overall 64 cases were studied and 34 were males and 30 were female. On the pain assessment at injection time no pain was in, almost all cases were without pain and only 8 cases showed mild pain and 4 showed moderate pain. During extraction, there was no pain among 46 patients, while 10 had mild pain and only 8 had moderate pain.

Conclusion: It was concluded that extra oral inferior alveolar nerve block technique is the best treatment option with less pain during injection, rapid onset of anesthesia, and less pain during extraction.

Keywords: Extraction of mandibular teeth, Extra oral IANB

Introduction

In dental procedures, injecting the local anesthetic agents into the mucous membrane and skin is the most prevalent. These minor and painful processes have apparent advantages for both surgeon and patient in minimizing the patient's pain in course of operation.¹ At the mandibular site, an injection method of inferior alveolar nerve block is prevalent for local anesthesia and often leads to effective pulpal anesthesia.² The lack of adequate bony points of reference and large variances in the ramus dimension and mandibular-foramen position are the factors for this technique's failure,³ in addition to other factors, like non-understanding of anatomical structures, patients with extreme anxiety, technical errors, infection or inflammation and impaired anesthetic solutions.⁴ The use of mandibular nerve block intra-oral methods is prevalent and commonly used in spite of some significant drawbacks and potential risks such as numerous needle pricks in case of multiple dental procedures in a particular region, especially within the mandible. The extra-oral methods have a broad range of indications and can be superior to intra-oral strategy.⁵ Extra-oral block is suggested for the acute inflammation causing conditions of jaw, mandibular fractures and cases where trismus makes intra-oral injection impossible.^{6,7} When oral sepsis occurs, injection in mouth is risky, primarily because the injection of liquid under pressure impairs the tissues and makes it more susceptible to disease. All injections are discontinued for any likely sepsis with extra-oral blocks. Extra-oral inferior alveolar nerve block indications include the anesthetising of entire mandibular nerve distribution for extensive surgical procedure in which general anesthesia cannot be performed, due to presence of trismus, local infection and further conditions that make block of inferior alveolar nerve's terminal branches further problematic or impossible. However in the literature less commonly described that the extra-oral techniques having wide spectrum of indication as well as can be more advantageous than intraoral techniques.⁸ The purpose of this study is to determine the effectiveness of extra-oral approach of inferior alveolar nerve block techniques in subjects undergoing the extraction of mandibular teeth. This study may help out the society as it will guide us to provide a definite treatment of block anesthesia for extraction of mandibular teeth. Above mentioned types of block anesthesia are useful, easy, safe, and having less complications to reduce the morbidity, help to improve patient's quality of life and also reduces the total cost of the treatment in patient particular and society at large.

Methodology

This cross sectional study was conducted at department of Oral & Maxillofacial Surgery, Institute of Dentistry, Liaquat University of Medical & Health Sciences Jamshoro / Hyderabad. Study duration was 6 months May 2018 to November 2018. The entire patient having age from 18-45 years regardless of gender, sub mucous fibrosis and willing to contribute in the study were included. All the patient with any systemic disease, immunocompromised patients, patients having any neurological disorders and un-co-operative patients were excluded. The clinical and demographic parameters such as age and gender were recorded. Well-versed and printed consent was taken from patient. The affected teeth were diagnosed by history, clinical examinations, per apical and Orthopantomogram radiographs. The mandibular teeth were anesthetised by extra oral inferior alveolar nerve block after scrubbing by palpating anterior and posterior parts of masseter muscle at lower body of mandible by marking at the pre auricular region and posterior part of the masseter muscle. After that needle were inserted between angle and posterior part of ramus of mandible and then anesthetic solution was deposited. Visual analog scale was used to record severity of the pain from 0 (no pain) to 10(worst pain) during the injection of anesthesia and during the extraction, the onset of the anesthesia was recorded in minutes for inferior alveolar nerve block in mandibular teeth anesthesia and the data recording was carried out by a proforma. SPSS (statistical package for social services) Version-20 was used for data analysis.

Results

Total 64 patients were studied their mean age was (34.21+13.65 years). out of all 34 were males and 30 were females. Table: No. 1

Table: No. 1. Mean age of the patients n=64		
	Variables	Statistics
Age		
	Mean \pm SD	34.21+13.65 years
	Minimum	18
	Maximum	45
Gender		
	Male	34(53.1%)
	Female	30(46.9%)
	Total	64(100.0%)

On the pain assessment at injection time, almost all cases were without pain and only 8 cases showed mild pain and 4 had moderate pain. While, no severe pain was found among both groups. Duration of onset of anesthesia was less, as most of the cases had duration of onset of anesthesia at 3 minutes, followed by 4 at 5 minutes and 3 at 6 minutes. On pain assessment during extraction, there was no pain among 46 cases, 10 cases showed mild pain and 8 had moderate pain, while no severe pain was documented. Table: No. 2.

Table: No. 2. Pain assessment and onset anesthesia among patients n=64		
Variables	Frequency	Percentage
Pain assessment on injection time		
No pain	52	81.2%
Mild pain	8	12.5%
Moderate pain	4	6.2%
Severe	00	0.0%
Onset of anesthesia duration		
3 minutes	50	78.1%
5 minutes	08	12.5%

6 minutes	06	9.4%
Pain during extraction		
No pain	46	71.9%
Mild pain	10	15.6%
Moderate pain	08	12.5%
Severe	00	0.0%

There was no significant impact was found of genders on pain durian extraction, p-value 0.359. Table: No. 3.

Table: No. 3. Pain assessment during extraction according to gender n=64				
Pain	Gender		Total	p-value
	Male	Female		
No pain	27	19	46	0.359
Mild pain	4	6	10	
Moderate pain	3	5	8	
Severe	34	30	64	
Total	27	19	46	



Fig 1: Extra oral inferior alveolar nerve block

Discussion

This study has been conducted to observe the best treatment option for teeth extraction, according to our knowledge this is observed that the extra oral inferior alveolar nerve block technique is best treatment option with less pain during injection, anesthesia rapid onset, and less pain during extraction. Other old published studies stated that the traditional Halstead technique is most frequently used for inferior alveolar nerve anesthesia in the United States,⁹ a direct method with an intraoral access to the inferior alveolar nerve just before penetrating the mandibular channel. This block technique has 71 to 87 percent of success rates,¹⁰ and partial anesthesia is not rare. In addition, the indirect method has been exhibited to be ineffective among 15% of cases.¹¹ Abbott SM et al¹² reported that Extra-oral Mandibular Nerve Block has several benefits like patient cooperation is not necessarily needed: The injection pathway is also closer to the nerve and can provide higher interaction between the nerve trunk and the local anesthetic solution. In another old study, Waikakul A et al¹³ reported comparable findings. In the literature it is stated that combination of extra-oral and intraoral benchmarks are implicated in for the technique of Gow-Gates mandibular block. Firstly, the maxillary second molar's mesiopalatal cusp determines the injection's height.¹⁴ The concurrent visualization of extra-oral structures are needed when the mandibular block method of Gow-Gates is administered is problematic and is frequently listed by doctors as a justification for the further mandibular block methods being preferred.¹⁵ However, clinical practice with the method is

regarded to tackle with early problems that may arise when the method is first applied. Furthermore, due to the greater distance between the mandibular nerve and the sites of local anesthetic deposition (~5–10 mm), and the bigger size of the nerve trunk at a comparatively higher level, the time needed for the anesthesia onset is greater than the direct IANB.¹⁴ However, the level of given injection has the benefit for anesthetising further terminal regions of the mandibular nerve contrasted to the methods of the lower-level block, decreasing the necessity for extra-oral injections for initial block supplementation. Our first approach is suggested that larger sample size and multicenter studies should be done to confirm the best technical option in the favour of our population. Because this study declared that extra oral technique had very lower rate of complication and almost pain free technique with duration of onset of anesthesia almost at 3 minutes.

Conclusion

It was concluded that that extra oral inferior alveolar nerve block technique is the best treatment with less pain during injection, anesthesia rapid onset, and less pain during extraction. More studies required on this comparison.

References

1. Kashyap MV, Desai R, Reddy BP, et al. Effect of alkalinisation of lignocaine for intra oral nerve block on pain during injection, and speed of onset of anaesthesia. *Br J Oral Maxillofac Surg* 2011;49:72-75.
2. Haghghat A, Jafari Z, Hasheminia D, Samandari MH, et al. Comparison of success rate and onset time of two different anesthesia techniques. *Med Oral Patol Oral Cir Bucal* 2015;20(4):459-463.
3. Ardakani FE, Bahrololoumi Z, Booshehri MZ, Azam AN, Ayatollahi F. The position of lingula as an index for inferior alveolar nerve block injection in 7-11-year-old children. *J Dent Res Dent Clin Dent Prospects* 2010;4(2):47-51.
4. Palti DG, deAlmedia CM, Andreo JC, et al. Anesthetic technique for inferior alveolar nerve block: a new approach. *J Appl Oral Sci* 2011;19(1):11-15
5. Radder K, Shah A, Fatima S, Kothari C, Zakaullah S, Siddiqua A. Efficacy and feasibility of frontozygomatic angle approach for extra oral maxillary nerve block in oral surgery: a descriptive clinical trial. *Journal of maxillofacial and oral surgery*. 2014 Sep 1;13(3):231-7.
6. Yalcin BK. Complications associated with local anesthesia in oral and maxillofacial surgery. In *Topics in Local Anesthetics* 2019 Jul 4. IntechOpen. <https://www.intechopen.com/books/topicsinlocalanesthetics/complicationsassociated-with-local-anesthesia-in-oral-and-maxillofacial-surgery>
7. BLANTON PL, JESKE AH. Avoiding complications in local anesthesia induction: anatomical considerations. *The Journal of the American Dental Association*. 2003 Jul 1;134(7):888-93.
8. R P, Ticku S. Efficacy of extra-oral Maxillary nerve block technique using frontozygomatic approach. *IJAR* 2017;3(1):781-789.
9. Malamed SF. The periodontal ligament (PDL) injection: an alternative to inferior alveolar nerve block. *Oral Surg Oral Med Oral Pathol*. 1982;53(2):117–121.
10. Kaufman E, Weinstein P, Milgrom P. Difficulties in achieving local anesthesia. *J Am Dent Assoc*. 1984;108(2):205–208
11. Northrop PM. Practical technics in administration of local anesthetic agents: questions and answers. *J Am Dent Assoc*. 1949;38(4):444–448.
12. Abbott SM, Prior S. Extraoral Mandibular Nerve Block: Comparative Evaluation of Local Anesthetic Distribution Using Ultrasonography. *Journal of Oral and Maxillofacial Surgery*. 2013;71(9):e39-40.
13. Waikakul A, Punwutikorn J. A comparative study of the extra-intraoral landmark technique and the direct technique for inferior alveolar nerve block. *J Oral Maxillofac Surg*. 1991; 49(8): 804-8;
14. S. Malamed, *Handbook of Local Anesthesia*, Mosby, St. Louis, Mo, USA, 5th edition, 2004.
15. Johnson TM, Badovinac R, Shaefer J. Teaching alternatives to the standard inferior alveolar nerve block in dental education: outcomes in clinical practice. *Journal of dental education*. 2007 Sep 1;71(9):1145-52.