

A Novel Approach in Removing of Maxillary Teeth

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ABSTRACT

Background: Pain-free operation is an additional advantage to the patient and assists the dentist in managing the patient in a peaceful, slow style. Injection in the palate is more painful of entirely oral cavity injections due to its abundant nervous supply and the tight binding of the palatal mucosa to its underlying periosteum.

Aim: This current research aimed to assess the efficacy of 2% lidocaine and 1:80,000 epinephrine with buccal vestibular infiltration injections without palatal infiltration injections compared with the buccal vestibular infiltration injections with palatal infiltration injections.

Materials and methods: This study was done in the College of Dentistry at the Iraqi university through 2021. The study sample included 100 patients, age range from 17 years old to 69, and all Iraqi nationality. There were 23 females and 77 males, with the diagnosis for any cases that indicated for extraction (necrotic pulp, chronic pulpitis etc.). It was splinted into two groups group 1 (50 patients, 11 female, and 39 male), which receive only full cartilage (1.8 mL) labial/buccal anesthesia injection and waiting for 8 minutes before extraction and didn't obtain palatal injection in the palate for removal of long-lasting teeth of maxillary and group 2 (50 patients, 12 female, and 38 male) which receives labial/buccal and palatal anesthesia for extraction of permanent maxillary teeth. All patients receive local anesthesia 1.8 mL carpule lidocaine local anesthetic agent concentration 2% with epinephrine vasoconstrictor concentration 1:80,000.

Results: In this study, deposition of lidocaine HCl to the buccal vestibule and 8-min latency period without palatal injection showed similar statistical results with using palatal injection n extraction of permanent maxillary teeth.

Conclusion: Pain control during a surgical procedure is one of the most important factors for reducing the fear and anxiety associated with a dental procedure. This approach reduces the discomfort and can be used as an alternative to palatal infiltration as the LA can diffuse through tissues more efficiently and give clinicians a chance to avoid painful palatal injections. It is recommended to use in all cases of uncomplicated maxillary exodontia to improve the patient's experience.

Keywords: Maxillary teeth extraction, Pain-free operation, Palatal injection.

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INTRODUCTION

The perfections in procedures for local anesthesia is possibly the greatest benefits improvements in dental skill to have happened in the previous years.¹ Pain-free operating is an additional advantage to the patient and assists the dentist in managing the patient in a peaceful, slow style.² The palatal injection is is considered most painful due to the injected oral cavity containing in its copious nervous source and the fitted obligatory of the mucosa palatal to its fundamental periosteum.³ Numerous methods have been exasperated to decrease the distress of injections, including transcutaneous electric nerve encouragement, superficial anesthetic use, superficial palate cooling, electronic injection schemes, pressure direction.^{4,5} Articaine can be longwinded through lax and firm tissues additional than other local anesthetics

mediators. Oral access of maxillary teeth by articaine delivers adequate anesthesia of soft tissue of palatal.⁶ Only a few prior studies have been assessed tooth elimination positively only with oral infiltration of articaine anesthesia, deprived of opposite palatal injection.^{4,7,8} Badenoch-Jones, examined the necessity for a palatal injection in the removal of a maxillary tooth.⁹ Additional studies describe that infiltration of lignocaine with a length of 8 minutes could remove the necessity of palatal injection.¹⁰ Together results in articaine and lidocaine obtainable comparable performance and features in a relative study between them.¹¹ This current research aimed to assess the efficacy of 2% lidocaine and 1:80,000 epinephrine with buccal vestibular infiltration injections without palatal infiltration injections compared with the buccal vestibular with palatal infiltration injections.

MATERIAL AND METHODS

Setting

This study was done in the College of Dentistry at the Iraqi university through 2021. The study sample included 100 patients, age range from 17 years old to 69, and all Iraqi nationality. There were 23 females and 77 males, with the diagnosis for any cases that indicated for extraction (necrotic pulp, chronic pulpitis etc). Splinted to two groups, group 1 (50 patients, 11 female, and 39 male), which received only full cartilage (1.8 mL) labial/buccal anesthesia injection, waiting for 8 minutes before extraction and didn't receive a palatal injection for removal of long-lasting maxillary teeth, and group 2 (50 patients, 12 female, and 38 male) which received labial/buccal and palatal anesthesia for extraction of permanent maxillary teeth. All patients receive local anesthesia 1.8 mL carpule lidocaine local anesthetic agent concentration 2% with epinephrine vasoconstrictor concentration 1:80,000. Exclusion criteria: (1) mandibular teeth, (2) primary teeth, (3) medically compromised patients. Identify the tooth or area of soft tissue to be anesthetized.

Clinical procedure

The periodontal ligament injection in the sulcus between the gingiva and the tooth, supine position, Grip the syringe analogous with the extended axis of the tooth on the mesial or distal part. Insertion the needle (bevel opposite the origin) to the deepness of the gingival sulcus till resistance is happened then injected an anesthetic solution gradually over the sequence of 20–30 seconds in group 1 save little droplets for palatal injection in group 2 (Figure 1).

It has to wait for 8 minutes to allow the spread of anesthetic solution through the maxillary trabecular bone to reach the palatal side in group 1. In group 2, it is supposed to wait only 2 minutes and give the palatal injection. To assess the pain score, the facial pain scale (FPS) and visual analog scale (VAS) were used. An Independent observer was assigned to assess the patients for FPS during extraction through facial or behavioral expressions. FPS was calculated based on the standard FPS score between 0 and 5 on the chart. FPS chart assessed the pain through facial expressions or behavior during the procedure. Explain for FPS scale (Face 0) is very happy because he doesn't

hurt at all. (Face 1) hurts just a little bit. (Face 2) hurts a little more. (Face 3) hurts even more. (Face 4) hurts a whole lot. (Face 5) hurts worst, as much as you can imagine, although you don't have to be crying to feel this bad. The result of FPS in our research was ranged from 0–3 without palatal injection and ranged from 0–4 in control group

It is useful to quantify the pain level that the patient has experienced through a VAS. This is usually done on a 0–10 scale, with 0 being no pain and a 10 signifying the worst pain the patient has ever experienced. After extraction, the patient was asked to mark their current pain level on the line. The Result of VAS in our research was ranged from 0–5 without palatal injection and ranged from 0–7 in the control group.

Statistical Analysis

The results are presented as a number, median, and mean ± SD. According to VAS and FPS scores of the two groups, the pain elicited when permanent maxillary teeth extracted with palatal injection and without palatal injection were compared by unpaired t-test. The difference was not statistically significant between the two groups >0.05

RESULTS

Table 1 shows the characteristics of the participants enrolled in this study. Male to female ratio was 3.6: 1

Table 1: Age and sex distribution of 100 cases.

Age	Male	Female	Total
Number of cases	77	23	100
percentage	77%	23%	100%
Range of age	18–69 years old	17–62 years old	17–69 years old

Table 2: 100 extracted teeth distribution according to site

Extracted teeth	Anterior teeth	Premolars & molars	Total
Number of cases	46	54	100
Percentage	46%	54%	100%



Figure 1: (A) Local anesthesia administration to maxillary left canine. (B) time recording waiting for 8 minutes

Table 3: Compare between VAS and FPS between group 1 and group 2

Group 1			Group 2		
Case No.	VAS (frequency)	FPS (frequency)	Case No.	VAS (frequency)	FPS (frequency)
0	27	14	0	31	0
1	3	14	1	6	1
2	6	4	2	9	2
3	4	8	3	4	3
4	3	2	5	0	4
5	7	6	-	-	-
7	0	2	-	-	-
Average	1.48	0.490	Average	1.96	1.12
mean	1.82	0.72	mean	1.96	1.12
SD	2	1.03	SD	1.97	1.29

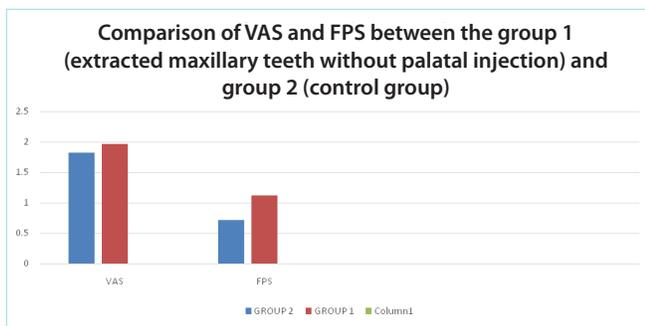


Figure 2: Compare between VAS and FPS between group 1 and group 2

Age ranged from (18–69) years in male and (17-62) years in female.

Table 2: Slight increase of extracted premolars and molars over-extracted anterior teeth (central and canine)

Table 3 show the VAS and FPS score of group 1(which receive only full cartilage (1.8 mL) labial/buccal anesthesia injection and waiting for 8 minutes before extraction and did not receive a palatal injection for removal of long-lasting maxillary teeth) much less than group 2 (which receive labial/ buccal and palatal anesthesia for extraction of permanent maxillary teeth)

Figure 2: Comparison of VAS and FPS between group 1 (extracted maxillary teeth without palatal injection) and group 2 (c ontrol group)

DISCUSSION

Controlling of pain is considered an important goal of management, so controlling pain and stopping it is considered the goal after surgical technique to decrease anxiety-related with that dental process.¹² The palatal mucosa is compacted and firmly assured to its fundamental periosteum also its copious nervous accompaniment; inoculations in the palate are always very tender.¹³ For numerous patients, palatal injections show to be an actual painful involvement, so they need palatal anesthesia.¹⁴ In the present study, admission of lidocaine HCl to the oral vestibule and 8 minutes inactivity time without

palatal injection displayed like consequences with using palatal injection removal of long-lasting maxillary teeth. Comparing with other studies applied on 100 patients, Group 1 without palatal injection was performed on 50 patients (18 female patients/32 male patients) with a mean age 35.2 VAS value was 5.30 and FPS was 0.98, Group 2: with palatal injection was performed on 50 patients VAS value was 4.82, and FPS value was 0.80 with taking in consideration that they performed on 100mm VAS and 0–10 FPS and use of 2 mL instead of 1.8 mL of 2% lidocaine with 1:200,00 instead of 1:800,00 epinephrine. This study agrees with our study that removing long-lasting maxillary teeth is probable by leaving local anesthesia to the oral vestibule of the tooth deprived of supplementation of palatal.¹⁵ Other study which is applied on 100 patients:

- *Study group:* consists of 75 patients (49 female and 26 male) with mean ages: 40.21The VAS of this group is 6.41 and FPS is 0.31
- *Control group with palatal injection the VAS of this group is 6And FPS: 0.028.* Here in this study, the alteration in the pain points expert by the patients of 2 groups presented that perfect penetration of lidocaine with a long inactivity period of 8 min could avoid the requirement of palatal injection, by its property of infusibility through tissues.

Therefore, this study agrees that single buccal infiltration of lidocaine is effective in permanent maxillary teeth to remove, 10 other study that was applied on 30 patients (19 women and 11 men) with mean age 17.73 ± 4.30 years, in articaine group (21, 26, and 28 years old) with little pain throughout removal, and no pain in the lignocaine group, rendering to VAS (3) and FPS (3) scores. This study agreed with the current study that the studies agree with our study in that removing long-lasting maxillary teeth is probable by leaving local anesthesia to the oral vestibule of the tooth without supplementation of palatal and with fewer pain and bleeding. With taking the consideration that using the different anesthetic agents.¹⁶ Other study, which was applied on 100 patients, entered the study to remove maxillary teeth for orthodontic causes, 64 were man and 36 were women. The mean age was 18 years, mean VAS scores of 1.1 for the investigational group and 1 for the controller group and the

FPS was (0), managed oral cavity 1.75 mL and palatal 0.5 mL infiltration of 2% lignocaine with 1:200,000 adrenaline on single side besides only oral infiltration 1.75 mL of 4% articaine with 1:100,000 adrenaline on the other side.¹⁷

CONCLUSION

Pain control during a surgical procedure is one of the most important factors for reducing the fear and anxiety associated with dental procedures. This approach reducing the discomfort can be used as an alternative to palatal infiltration. The LA can diffuse through tissues more efficiently and give clinicians a chance to avoid painful palatal injections. It is recommended to use in all cases of uncomplicated maxillary exodontia to improve the patient's experience.

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REFERENCES

- Hawkins JM, Moore PA, Porter PJ, Kass EH. Local anaesthesia: advances in agents and techniques. *Dent Clin North Am.* 2002;46:719-732.
- Meechan JG, Howlett PC, Smith BD (2005) Factors influencing the discomfort of intraoral needle penetration. *Anesth Prog* 52:91-94
- Overman PR. Articaine: a new alternative in dental hygiene pain control. *J Dent Hyg.* Summer;2007;81(3):66.
- S Uckan, E Dayangac, K Araz. Is permanent maxillary tooth removal without palatal injection possible? *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2006;102:733.
- Malamed SF, Gagnon S, Leblanc D. Efficacy of articaine: a new amide local anesthetic. *J Am Dent Assoc.* 2000;131:535-642.
- Phyo HE, Chaiyasamut T, Kiattavorncharoen S, Pairuchvej V, Bhattarai BP, Wongsirichat N. Single buccal infiltration of high concentration lignocaine versus articaine in maxillary third molar surgery. *J Dent Anesth Pain Med.* 2020 Aug;20(4): 203-212.
- S Fan, WL Chen, ZH Yang, et al. Comparison of the efficiencies of permanent maxillary tooth removal performed with single buccal infiltration versus routine buccal and palatal injection. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2009;107:359
- Ozec Ilker, Tasdemir Ufuk, Gumus Cesor, Solak Orhan. Is It Possible to Anesthetize Palatal Tissues With Buccal 4% Articaine Injection? *J Oral Maxillofac Surg.* 2010;68:1032-1037.
- Badenoch-Jones EK, Lincoln T. Palatal injection for removal of maxillary teeth: Is it required? A systematic review. *Int J Oral Maxillofac Surg.* 2016;45:1283-1292.
- GR Sekhar, T Nagaraju, KolliGiri, V Nandagopal, R Sudheer, Sravan Is palatal injection mandatory prior to extraction of permanent maxillary tooth: A preliminary study. *Indian J of Dental Research.* 2011;22(1):100-102
- Dimitroulis G. *Handbook of Third Molar Surgery.* Oxford, United Kingdom: Wright; 2001.
- PC Oliveira, MC Volpato, JC Ramacciato, J Ranali. Articaine and lignocaine efficiency in infiltration anaesthesia: a pilot study. *British Dental Journal.* 2004;197:45-46.
- Malik A. Technique tips--distraction anaesthesia: applying the gate control theory in delivering painless anaesthesia. *Dent Update.* 2015 Jan-Feb;42(1):97.
- Montasem A. The Impact of Job Engagement and Recovery on Dentists' Well-Being. *J Mass Dent Soc.* 2017 Spring;66(1):14-17.
- Ali, W., Et Al. "Use Of Only Buccal Infiltration Of 2% Lidocaine With Epinephrine For The Removal Of Maxillary Teeth." *Biomedica* 2018, 34 (1):44-47.
- Somuri, Anand Vijay, A. Bhagavandas Rai, and Manju Pillai. "Extraction of permanent maxillary teeth by only buccal infiltration of articaine." *Journal of maxillofacial and oral surgery.* 2013,12 (2):130-132.]
- Sandilya V, Andrade NN, Mathai PC, Aggarwal N, Sahu V, Nerurkar S. A Randomized Control Trial Comparing Buccal Infiltration of 4% Articaine with Buccal and Palatal Infiltration of 2% Lignocaine for the Extraction of Maxillary Premolar Teeth. *Contemp Clin Dent.* 2019 Apr-Jun;10(2):284-288.