USE OF ONLY BUCCAL INFILTRATION OF 2% LIDOCAINE WITH EPINEPHRINE FOR THE REMOVAL OF MAXILLARY TEETH

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ABSTRACT

Background and Objectives: Palatal injections for dental extractions are one of the most uncomfortable experiences for patient undergoing oral surgery. Our aim in this study is to suggest an alternative technique to avoid this procedure and enhance patient acceptibility. This study is designed to show if 2% lidocaine hydrochloride with 1:100,000 epinephrine given only buccally could produce effective palatal anaesthesia in maxillary teeth for removal.

Methods: A total of 100 patients presenting to the Oral and maxillofacial Surgery department in Akhtar Saeed Medical and Dental College from July 2017 to January 2018 were included in the study. All patients that required extraction of any maxillary tooth of either side were included in this study. The sample was divided into two groups. Group 1, the study group had 50 patients who received a single buccal injection before extraction. While Group 2 – the control group had 50 patients who received both buccal and palatal injections before the extraction. Extraction was performed in both the groups after 5 minutes. For scoring, every subject was observed for Face Pain Scale during extraction and questioned later on a 100 mm visual analog scale.

Results: The difference between the Visual Analog Scale and Face Pain Scale score with palatal injection and without palatal injection was not statistically significant (P. 0.05) in the extraction of maxillary tooth. Hence, according to this study, it is possible to extract maxillary third molar if only 2 mL of 2% lido-caine hydrochloride with 1 : 200,000 epinephrine is injected buccally.

Key Words: Maxillary tooth; Lidocaine; Buccal infiltration; Local anesthesia, Pain.

INTRODUCTION

For optimal patient management, attaining adequate anaesthesia is a prerequisite in many dental treatments.[1] Extraction of maxillary teeth is among commonly performed procedures in oral surgery. Maxillary teeth may be extracted owing to caries, periodontal diseases or orthodontic requirements etc.[1] With optimum pain control, most maxillary extractions whether simple or complicated can be done under local anaesthesia. The current general practice is to infiltrate both buccal and palatal sides for maxillary extraction.[1,2] However, palatal injection has also been stated as one of the most painful experiences in dentistry manly because of tightly adherent palatal mucosa and rich sensory nerve supply.[2]

To reduce the patient discomfort because of the palatal injections, researchers have tried many different techniques from in the past like pressure administration, topical anaesthetics, topical cooling through vaporisation, transcutaneous electronic nerve stimulition, and even mixing different aesthetics agents.[2] Another article has shown higher diffusibility through soft as well as hard tissue and hence can help in avoiing palatal injection in the third molar removal.[3] A comparative study between articane and lidocaine, showed that both the anesthetic agents had very similar behaviour due to the spongy maxillary bone lined by a thin buccal plate. Hence the purpose of this study was to find out that if lidocaine hydrochloride with epinephrine, injected only buccally, without any palatal infiltration, could provide adequate anaesthesia for the extraction of a maxillary tooth.

PATIENTS AND METHODS

Group 1: The study group, comprised of total 50 patients, among which 18 were women and 32 were men with the mean age of 35.2 years. Selection Criteria included - 1. Any subject that presented to Oral and Maxillofacial surgery for removal of any maxillary tooth for reasons like – non-restorable tooth due to extensive caries or periodontal disease or for orthodontic extractions. 2. Subjects that had no systemic condition that contradicted the removal of tooth. 3. Subjects that did not require the removal of impacted tooth. After selec-

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tion, only one tooth was extracted from the maxillary arch.

Procedure followed in the Study Group (Group 1) of all 50 patients was - 2 mL (2% lidocaine HCl with 1: 100,000 epinephrine) administered in the mucobuccal fold under aseptic technique. Similar protocol was followed in the Control Group (Group 2) that also consisted of 50 subjects, but 1.75 mL lidocaine with 1: 100,000 epinephrine was injected buccally, while 0.25 mL was injected palatally. Then, extraction was performed after the wait of 5 minutes in all the patients. For extraction, elevation and forced techniques were used but with minimal reflection of palatal gingiva.

To assess the pain score, Faces Pain Scale (FPS) and a 100 mm Visual Analog Scale (VAS) was used. An Independent observer was assigned to periodically assess the subjects for FPS scale during extraction through facial or behavioural expressions. Patients were later asked to describe their pain intensity using the VAS.

The minimum on VAS was "no pain" and the maximum was "Worst Pain". FPS was calculated based on the standard FPS score between 0 and 10, on the chart. FPS chart assessed the pain through facial expressions or behaviour during the procedure.

Facial Pain Scale

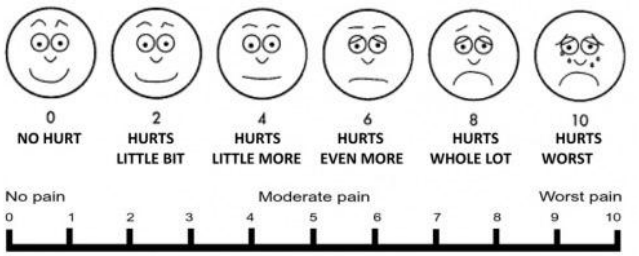

Table 1: *Visual Analog Scale.*

Values	*Group 1 (50 Patients)*	*Group 2 (50 Patients)*
Mean	5.30	4.82
SD	11.71	9.72
No. of patients	50	50
T-test	0.31	
Df	198	
P-value	0.75	

Key:
Group 1- Study group
Group 2- Control group
SD- Standard deviation
DF- Degree of freedom

Table 2: *Facial Pain Scale.*

Values	*Group 1 (50 Patients)*	*Group 2 (50 Patients)*
Mean	0.98	0.80
SD	1.79	1.50
No. of patients	50	50
t	0.77	
df	198	
P	0.44	

Key
Group 1- Study group
Group 2- Control group
SD- Standard deviation
DF- Degree of freedom

RESULTS

Both the group 1 and Group 2 were compared (Tables 1 and 2), based on VAS and FPS score to elicit the pain in tooth extraction with and without palatal injections. VAS value came out to be 5.30 for Group 1 and 4.82 for Group 2. FPS value was 0.98 for Group 1 and Group 2 had 0.80. SD and t test were used for statistical analysis for both the variables. VAS score value calculated by t test and FPS score was 0.31 and 0.77 respectively. Statistically, the difference was not significant between Group 1 and 2 (P value > 0.05).

DISCUSSION

Maxillary teeth extraction is a common procedure in Oral surgery.[1,2,3] To achieve optimum anesthesia, although painful but palatal anesthesia is a prerequisite. To reduce this discomfort of palatal anesthesia, many techniques have been tried and tested like topical pressure, topical anesthesia, computed assisted anesthesia and trans papillary injections.[2]

Intra-oral injections for local anesthesia has been proven in literature to be a cause of fear for many patients.[2] So, a palatal injection which has a documented proof of pain and discomfort may increase fear and decrease the patient cooperation, especially in anxious patients.[5] To reduce this pain upon palatal infiltration, various methods have been tried, like, topical anesthesia before the injection, slow deposition of solution or altering its pH or temperature. Although not yet proven as effective, the method most commonly practiced is topical anesthesia.[6] The pain on palatal anesthesia remains due to palate's rich sensory supply as well as adherent and dense mucosa overlying the periosteum. Using a 30-guage needle to reduce the palatal injection pain, is the next most commonly used method.[2,4,5] Although, a 30-guage needle has no advantage over a 25-gauge needle reportedly. According to Malamed, there is no specific recommendation for a 30-guage needle. Lidocaine and prilocaine when used a eutectic mixture has been proven to be more effective than convent-

ional topical anesthesia.[7] When applied for 5 minutes, this mixture achieves greater topical anesthesia and reduces pain significantly during palatal infiltration. Although more effective, the use of this mixture is considered less likely because of its cost, very unpleasant taste and the application time of 5 minutes as a topical anesthetic.[7]

Transcutaneous electric nerve stimulation was first described by Shane and Kessler in the year 1967.[2] Malamud et al, then used the term electronic dental anesthesia. It is a procedure that is considered safe, non-invasive and generally well accepted by the patients. Hence, electronic anesthesia is considered a feasible method to control pain and a substantial alternative of other local anesthesia techniques by some clinicians.[2] All the above-mentioned techniques, although useful but have their limitations like, cost, complexity of the procedure and time duration. In only buccal infiltration, local anesthetic solution is administered in the mucobuccal fold and then allowed to diffuse palatally. The diffusion of anesthetic solution is supported by thin buccal cortical bone of maxilla that is surrounding a very spongy trabecular bone inside. This technique of only buccal infiltration to achieve anesthesia of palate has never been investigated before.

As for the anesthetic agent, some studies have claimed that articane can diffuse through soft and hard tissue better than lidocaine but, in a comparative clinical study between the two, this superiority could not be statistically proven.[2] In this study, using 2 mL of 2% lidocaine hydrochloride with epinephrine only buccal without any palatal injection, we observed that there was no significant difference in pain that the patient experienced while undergoing the extraction of a maxillary tooth. Hence, this study shows that an optimal anesthesia can be achieved in the maxillary arch by using 2% lidocaine hydrochloride with 1: 200,000 epinephrine for only buccal infiltration and a supplemental palatal infiltration injection may not be needed.

CONCLUSION

The conclusion is that extraction of a permanent maxillary tooth without a palatal injection may be possible by infiltrating 2 mL of 2% lidocaine hydrochloride with 1: 200,000 epinephrine only in the buccal vestibule of the tooth.[6]

Authors' Contribution

WA: Designing of the research, literature search, data collection, data analysis, drafting of article and abstract writing. SSK: Conception and design of research, drafting of article and final review of article. KSM: Conception and design of research, drafting of article and final review of article. RC: Conception and design of research, drafting of article and final review of article. SY: Conception and design of research, drafting of article and final review of article.

Disclaimer

The views expressed in the submitted article are our own and not an official position of the institution.

Conflict of Interest Declaration

None.

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