Case Report

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Efficacy of Buccal Infiltration Over Buccal and Palatal Injection Techniques: A Case Report

Ankur Mittal[1*] Siddharth Sharma[2] Md. Manzer[3] Prem Shanker Kumar[4] Dharmika Jagani Banana[5] Pankaj Kumar Singh[6]

[1]Professor and Head, Department of Oral and Maxillofacial Surgery, D.J. College of Dental Sciences and Research, Gaziabad, U.P, India.
[2]Senior Lecturer, Department of Oral and Maxillofacial Surgery, D.J. College of Dental Sciences and Research, Gaziabad, U.P, India.
[3]Post Graduate Student, Department of Oral and Maxillofacial Surgery, D.J. College of Dental Sciences and Research, Gaziabad, U.P, India.
[4]Post Graduate Student, Department of Oral and Maxillofacial Surgery, D.J. College of Dental Sciences and Research, Gaziabad, U.P, India.
[5]Post Graduate Student, Department of Oral and Maxillofacial Surgery, D.J. College of Dental Sciences and Research, Gaziabad, U.P, India.
[6]Post Graduate Student, Department of Oral and Maxillofacial Surgery, D.J. College of Dental Sciences and Research, Gaziabad, U.P, India.

ABSTRACT

Background: The study aimed at evaluating the clinical efficacy of buccal infiltration over conventional buccal and palatal injection techniques. One of the most important skills for dental practitioners to attain is the ability to provide safe and effective localanaesthesia (LA). The injection is perhaps the greatest source of fear among patients, which results in the problem of fear of needles (trypanophobia) which, in turn, may lead to syncope or other medical emergencies during the injection of a local anaesthetic. A combination of factors, including knowledge of the agents used, the anatomy involved, modern techniques, devices and proper deposition of the local anesthetics while performing nerve blocks (close to the nerve in order to obtain optimal diffusion, but without causing mechanical trauma), will result in profound anaesthesia and a pain-free dental experience. A clinical study was performed in 85 patients (53 females and 32males) in Department of oral & maxillofacial surgery, DivyaJyoti college of dental sciences and research, Modinagar. This study was conducted on adults from local population requiring extraction who were having partial edentulous and complete dentulous. Patients prior to extraction a detailed history of the patients was carefully recorded and patients were apprised about the potential risks and benefits of procedure and an informed consent was obtained on prescribed format.

Keywords: Lignocaine, Articaine, Buccal Infiltration, Intra Pulpal, Intra Septal Anesthesia.

INTRODUCTION

One of the most important skills for dental practitioners to attain is the ability to provide safe and effective local anesthesia (LA). The injection is perhaps the greatest source of fear among patients, which results in the problem of fear of needles (trypanophobia) which, in turn, may lead to syncope or other medical emergencies during the injection of a local anesthetic. A combination of factors, including knowledge of the agents used, the anatomy involved, modern techniques, devices and proper deposition of the local anesthetics while performing nerve blocks (close to the nerve in order to obtain optimal diffusion, but without causing mechanical trauma), will result in profound anesthesia and a pain-free dental experience.[1]In the light of these facts and dilemma, supplemental injection techniques are the solution that can help the dentist to carry out the pain-free dental treatment. On the basis of anatomical site of injection, commonly used supplemental local anesthetic techniques are termed as intraligamentary (periodontal ligament), intraosseous (alveolar bone), intrapulpal (pulp), and intraseptal (bony septum) injections. [2] Dental treatment has been synonymous with pain since time immemorial, and this is the sole reason why

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***Correspondence Dr. Ankur Mittal.**
Department of Oral and Maxillofacial Surgery, D.J. College of Dental Sciences and Research, Gaziabad, U.P, India.
Email: Not Disclosed

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patients are anxious in seeking it. Administration of local anesthesia is one of the first clinical procedures before the commencement of the endodontic treatment. Hence, efficient pain control is of utmost importance. **Most popular local anesthetic agents.**Local anaesthetics used in dentistry fall into two groups: esters (benzocaine, procaine) and amides (lidocaine, articaine, bupivacaine, prilocaine, mepivacaine). Amides are used more frequently compared to esters, as amides produce a more rapid and profound anaesthetic effect. Esters are no longer produced in injectable form. **Lidocaine**is the most common local anaesthetic to be used in dentistry. It was developed in 1943 and introduced into themarket in 1948 by Nils Lofgren. It is characterized by a rapid onset of action and intermediate duration of efficacy. As a result, lidocaine is suitable for surface, infiltration and block anaesthesia. Lidocaine is usually used at a 2% concentration. The onset of lidocaine is about 45–90 s and its duration of action is 10–20 min. It is about 95% metabolized in the liver .**Articaine**. Originally called 'Carticaine', it was first prepared by Rusching et al. in 1969. It is the only amide local anesthetic that contains a thiophene ring and an additional ester ring. The thiophene ring increases its lipid solubility which, in turn, makes it highly diffusible and effective at penetrating tissues, and 95% is plasma protein bound. The presence of the amide and ester linkage reduces the risk of overdosing, which could lead to a toxic reaction. Elimination of articaine is through the kidneys [2]. Many local anaesthetics have epinephrine added to them to cause vasoconstriction of the neighbouring capillaries, which results in slower absorption of the anaesthetic and increased the time of action.**Bupivacaine. S**ynthesized in 1957 by Ekenstam and was first used in a clinical setting in 1963. It is constructed with a longer side chain with four methylene groups on the piperidine ring that is responsible for the different properties of bupivacaine, compared to lignocaine. The onset of bupivacaine ranges from 1–17 min and the duration of action lasts 2–9 h. The duration of anaesthesia is significantly longer with Bupivacaine than with any other commonly used local anesthetic. It is usually used at a 0.5% concentration .**Mepivacaine.** First introduced into dentistry in 1960 as a 2%solution containing vasoconstrictor levonordefrin. In 1961,a 3% solution without any vasoconstrictor was developed. Mepivacaine has a very similar anaesthetic potency to lidocaine, but also has milder vasodilating ability, which leads to a longer duration of anaesthesia without the use of a vasoconstrictor. Mepivacaine is the third most widely used local anesthetic in dentistry after lidocaine and articaine. In dentistry, mepivacaine is available as a 3% solution without vasoconstrictors or as a 2% solution with vasoconstrictors [7]. **Prilocaine** was introduced to the market in 1965. It is less toxic and less potent than mepivacaine or lidocaine and provides a slightly longer duration of action. It is available as 4% prilocaine with epinephrine and as plain 4% prilocaine. There have been reports that the administration of prilocaine in children may induce methemoglobinaemia. This is a condition that affects oxygen levels in the blood [6]. As a result, prilocaine should not be used in children younger than 6-months old, pregnant women, or in patients taking oxidizing drugs. Practitioners should be vigilant of the dosing guidelines in order to ensure patient safety

AIM & OBJECTIVE

The aim of the study was to clinically determine the anesthetic efficacy of buccal infiltration over conventional buccal and palatal nerve block technique using 2% Lidocaine with 1:80,000 epinephrine as the anaesthetic agent in maxilla.

1.Pain

2.buccal infiltration effectiveness

MATERIAL & METHODS

A clinical study was performed in 85 patients (53 females and 32males) in Department of oral & maxillofacial surgery,DivyaJyoti college of dental sciences and research, Modinagar. This study was conducted on adults from local population requiring extraction who were having partial edentulous and complete dentulous. Patients prior to the commencement of implant surgery a detailed history of the patients was carefully recorded and patients were apprised about the potential risks and benefits and an informed consent was obtained on prescribed format.

SAMPLE SIZE

85 patients

Study will be conducted under four main groups namely:

i. Age (15-25)
ii. Age (25-40)
iii. Age (40-60)
iv. Age (60 –above)

Inclusion Criteria

- ✓ Willing to accept the conditions of the study and to give informed consent.
- ✓ No radiotherapy in head & neck area before 6 months .
- ✓ Patients above 16 years of age
- ✓ Patients with proper oral hygiene
- ✓ Adequate patients compliance
- ✓ Patients neurologically and hemodynamically stable enough to undergo a lengthy surgical procedure.

Exclusion criteria

- ✓ Any systemic disease that jeopardizes surgical treatment e.g. cardiovascular diseases, neuromuscular diseases, osteoporosis, uncontrolled diabetes.
- ✓ Psychological or psychiatric conditions that could influence the subjects reaction to treatment
- ✓ Acute or chronic symptoms of temporomandibular disorders
- ✓ History of radiation therapy to the orofacial region.
- ✓ Refusal of informed consent.
- ✓ Patients allergic to drugs and anesthetics.

METHODOLOGY

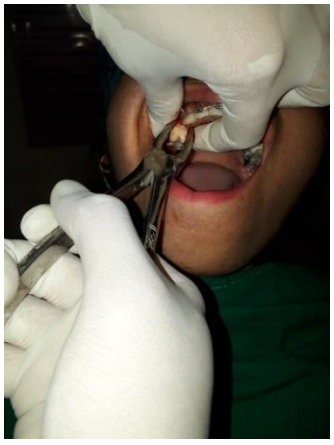
A Total of 85 patients were selected and randomly assigned to 4 age groups

1 Age (15-25)
2 Age (25-40)
3 Age (40-60)
4 Age (60 –above)

All the patients were operated under aseptic conditions using sterile instruments and drapes. 2% lignocaine with adrenaline local anesthetic was used in all cases. After aspiration, 2 mL of the anesthetic was injected and several aspirations were carried out during injection . All the injections were carried out by in 45 sec with the use of standard dental syringe with a 27-guage needle measuring 20 mm in length. After 5-7 min, flap was raised using Molt no .9 periosteal elevator on buccal and palatal side the reflection of gingiva and periosteum . The patients were asked to report the presence or absence of pain during the procedure. Pain is measured using wong baker pain rating scale.

CASE

LOCAL INFILTRATION BUCCAL REFLECTION LINGUAL REFLECTION



EXTRACTION

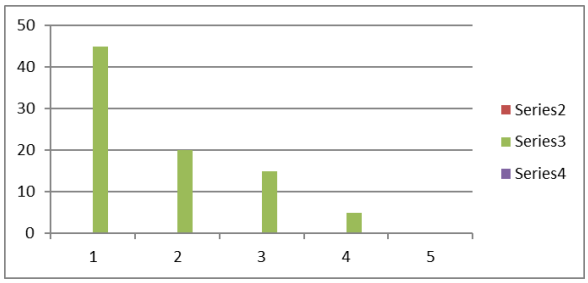
RESULT

The present study was conducted at Department of oral and maxillofacial surgery, Divya Jyoti college of Dental Sciences and Research, Modinagar to the study on"Anesthetic efficacy of buccal local infiltration over conventional buccal and palatal injection techniques using 2% lidocaine with 1:80,000 epinephrine in patients. A total of 85 dentulous and partial edentulous patients were

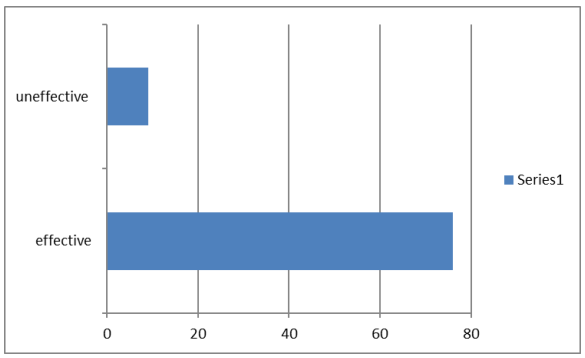
enrolled in our study and were assigned into 4 age groups. In group 1 (45 patients), group -2(20 patients), group-3(15patients), group-4 (5 patients) evaluate the determining parameter Pain and discomfort numeric pain rating scale and effectiveness of anesthesia

Table 1: Comparison of effect of pain

GP	Mean	Std. Deviation	Std. Error Mean	P value	Significance
WITHOUT PAIN	3.18	0.593	0.209	0.043	Significant
WITH PAIN	2.80	0.258	0.081		



Graph 1: Age group



Group 2: Effectiveness of local anesthesia

DISSCUSSION

The present study of the efficacy of buccal infiltration over conventional buccal and palatal injection techniques with 2% lignocaine with ADR in maxillary teeth and age more than 15 years to 70 years, the result showed the buccal infiltration is more effective anesthesia technique except in any case of periapical lesion and significant difference in age groups as younger age groups are more effective in comparison to older age groups.

In the present study, we have compared the efficacy of 2% lidocainewhen administered as buccal infiltration in the maxilla .Management of pain during oral surgical procedures has always been a challenge and area of continued interest. In our study , 9 patients are with pain and 76 patients had no pain with lignocaine 2% with 1:80000epinephrine. patients complaining with pain have periapical lesions so buccal infiltration alone is ineffective so given with palatal anesthesia for these patients after which pain is reduced comparatively. our study shows buccal infiltration is effective along with time. It is more effective after waiting for 5 to 7 minutes and advantage is palatal anesthesia is not required as palatal anesthesia is more painful than buccal anesthesia, patients is pain free .

CONCLUSION

Over the past 50 years or so, huge advances in knowledge and research into local anaesthetics have provided dental practitioners with new techniques and agents that are safer to administer to their patients. In return, the patients themselves experience significantly reduced pain during the injection, which provides more comfort and a less stressfulexperience when visiting the dentist effect of local anesthesia . Dental techniques demanding significant pulpal, bone, and soft-tissue anesthesia can be adequately and securely acquired using ISA. It can be a first choice anesthesia for teeth extractions.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

REFERENCES

1. Role of intraseptal anesthesia for pain-free dental treatment -G Gazal, WM Fareed, MS Zafar DOI: 10.4103/1658-354X.169482

2. Local anesthetics and advances in their administration – an overview-Robert M Jung, Magdalena A Rybak, Paweł T Milner, Natalia Lewkowicz Journal of Pre-Clinical and Clinical Research, 2017, Vol 11, No 1, 94-101

3. Estimation of Anesthetic Success Rates: The Efficacy of Articaine versus Lidocaine-Smith DK, Smith LE and Blume JD DOI: 10.4172/2470-0886.1000125

4. Anesthetic Efficacy Of Buccal And Lingual Infiltrations Of Lidocaine Following An Inferior Alveolar Nerve Block In Mandibular Posterior Teeth-William Foster, Melissa Drum, Al Reader, Mike Beck

5. Ågren E, Danielsson K. Conduction block analgesia in the mandible. Swed Dent J. 1981;5:81–89.

6. Vreeland D, Reader A, Beck M, Meyers W, Weaver J. An evaluation of volumes and concentrations of lidocaine in human inferior alveolar nerve block. J Endod. 1989;15:6–12.

7. Hinkley S, Reader A, Beck M, Meyers W. An evaluation of 4% prilocaine with 1:200,000 epinephrine and 2% mepivacaine with levonordefrin compared to 2% lidocaine with 1:100,000 epinephrine for inferior alveolar nerve block. AnesthProg. 1991;38:84–89.

8. The use of the mandibular infiltration anesthetic technique in adultsJohn G. Meechan*JADA 2011;142(9 suppl):19S-24S.*

9. A comparative evaluation of 4% articaine and 2% lidocaine in mandibular buccal infiltration anesthesia: A clinical study-SunithMaruthingal, Dennis Mohan, Ramesh Kumar Maroli, Ali Alahmari, Ahmed Alqahtani, Mohammed Alsadoon **DOI:** 10.4103/2231-0762.167717

10. Anesthetic efficacy of 4% articaine versus 2% lignocaine during the surgical removal of the third molar: A comparative prospective study-Nikil Kumar Jain, Reena Rachel John- **DOI:** 10.4103/0259-1162.171445.