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Original Article

Dentistry Section

Anaesthesia Techniques for Maxillary Molars – A Questionnaire-Based Retrospective Field Survey of Dentist in Western India

GANESH RANGANATH JADHAV[1], PRIYA MITTAL[2]

ABSTRACT

Introduction: Clinicians use various anaesthesia techniques like Posterior Superior Alveolar (PSA) nerve block, buccal infiltration with or without supplemental anaesthesia like palatal and intraligamentary infiltrations for root canal treatment in maxillary molars. However there is no general consensus regarding which technique is enough for performing endodontic treatment in maxillary molars.

Aim: The aim of this questionnaire-based survey is to compare and evaluate the various techniques used to anaesthetize the maxillary molars and its effect on postoperative pain.

Materials and Methods: The data were obtained from 290 dental practitioners using a specially prepared questionnaire survey conducted anonymously. The questionnaire contained questions covering data such as years in dentistry, acquired specialty, techniques used for anaesthetizing maxillary molars, success of anaesthesia, and postoperative pain, etc.

Results: Buccal infilteration with supplemental anaesthesia in the form of palatal (82%) and intra-ligamentary infilteration (88%) show higher success rate compared to only buccal infilteration (69%). However, intra-ligamentary infilteration group showed highest rate (75%) of postoperative pain. General practitioners (62% of clinicians) prefer to give both buccal and palatal infilterations and specialists opt for only buccal infilteration (66-74% of specialists).

Conclusion: Only buccal infilteration is sufficient during root canal treatment of maxillary molars. Routine use of supplemental anaesthesia in the form of palatal and intra-ligamentary infilteration is not necessary unless patient experiences discomfort during endodontic treatment. However, intra-ligamentary infilteration may lead to postoperative discomfort in the form of pain.

Keywords: Buccal infiltration, Intraligamentary infiltration, Palatal infiltration, Posterior superior alveolar (PSA) nerve block, Supplemental anaesthesia

INTRODUCTION

The techniques used to anaesthetize maxillary molars for endodontic purpose include Posterior Superior Alveolar (PSA) nerve block, buccal infiltration with or without supplemental anaesthesia in the form of palatal or buccal infiltrations [1-3]. In PSA block needle is inserted into the buccal mucosa above the second molar in an upward-backward direction and anaesthetic solution is deposited [4]. PSA nerve block is not routinely used to perform root canal treatment in maxillary molars because buccal infilteration is sufficient to anaesthetize the maxillary molars and intravascular injection during block may lead to rare complications like diplopia, blurring of vision, mydriasis palpebral ptosis, temporary paralysis of the cranial nerves that govern eye movement that is oculomotor, trochlear, and abducens nerves [5-13]. Buccal infiltration anaesthesia is safe and commonly used for providing pulpal anaesthesia in maxillary teeth [14,15]. In infiltration technique local anaesthetic solution diffuses into the cancellous bone via the porous thin cortical plate and provides a success rate of 72% to 100% in healthy pulps [16-19]. The intraligamentary infiltration can be used as primary or supplemental anaesthesia technique. However primary intraligamentary anaesthesia technique doesn't provide adequate pain control in endodontic treatment and its success rate is found to be low around 50%. Hence it is widely used as a supplemental anaesthesia. There is no general consensus regarding which technique is ideal for performing endodontic treatment in maxillary molars. Extrapolating from the above facts, this questionnaire-based survey on Indian Dentist was conducted to compare and evaluate the various techniques used to anaesthetize the maxillary molars and its effect on postoperative pain.

MATERIALS AND METHODS

Overall, the 2014 questionnaire-based retrospective field survey of dentists in Western India resulted in a total of 290 questionnaires received personally from the sample of 320 adult respondents. The response rate was 90.63%. Refusal rates were lower due to simple design of questionnaire and simultaneous distribution and collection of questionnaire personally. The study sample included 290 dental practitioners (general practitioner–173; endodontist-42; other specialities-75) from Western Maharashtra. The survey was conducted in October 2014. The data were obtained using a specially prepared questionnaire survey which was conducted anonymously. The questionnaire contained questions covering data such as years in dentistry, acquired specialty, techniques used for anaesthetizing maxillary molars, success of anaesthesia, and postoperative pain at 72 hours, etc. Data was processed, analysed and tabulated.

RESULTS

Buccal infilteration with supplemental anaesthesia in the form of palatal (82%) and intra-ligamentary infilteration (88%) show higher success rate compared to only buccal infilteration (69%) [Table/Fig-1]. General practitioners (62% of clinicians) prefer to give both buccal and palatal infilterations and specialists opt for only buccal infilteration (66-74% of specialists) [Table/Fig-2]. Buccal infilteration with supplemental anaesthesia in the form of palatal (82%) and intra-ligamentary infilteration (88%) showed higher success rate compared to only buccal infilteration (69%) [Table/Fig-3]. However, intra-ligamentary infilteration group showed highest rate (75%) of postoperative pain [Table/Fig-4].

Years in dentistry	BI	BI+PI	BI+IL
up to 10 years	68	37	5
10-20 years	45	47	8
over 20 years	27	50	3

[Table/Fig-1]: Distribution of techniques used according to clinical experience.

	BI	BI+PI	BI+IL
GP	59	107	7
ENDO	31	11	0
OTHER SPECIALITIES	50	16	9

[Table/Fig-2]: Distribution of techniques used according to specialties.

	Yes	Not Always	No
BI	97	40	13
BI+PI	112	20	5
BI+IL	14	2	0

[Table/Fig-3]: Evaluation of success of anaesthesia.

	Yes	No
BI	0	140
BI+PI	0	137
BI+IL	12	4

[Table/Fig-4]: Evaluation of postoperative pain.

Anesthesia techniques for maxillary molars – A questionnaire-based retrospective field survey of dentist in Western India
Principal Investigator – Dr Ganesh Jadhav

1. Since how long you have been practicing dentistry?
   A. Upto 10 years
   B. 10-20 years
   C. More than 20 years
2. Are you a specialist? If yes, please mention your specialty.
   A. No
   B. Yes – a. Endodontist
   b. Other speciality
3. Which technique do you use for root canal treatment of maxillary molar?
   A. Buccal infilteration
   B. Buccal infilteration and Palatal infilteration
   C. Buccal infilteration and Intra-ligamentary infilteration
4. Considering intra-operative pain as a success of anesthesia, how do you rate the success of your anesthesia technique?
   A. Yes
   B. Not always
   C. No
5. Do you feel there any evidence of higher chances of post-operative pain at 72 hours related to anesthesia technique?
   A. Yes
   B. No

The following information is optional:
Your name: _____
Designation: _____
Institute/: _____
Clinic address

Thank you very much for sparing your time. Best wishes!

[Table/Fig-5]: Questionnaire of the Study.

DISCUSSION

The present retrospective questionnaire-based [Table/Fig-5] field survey was conducted to throw light on the current trends and consensus regarding the various techniques used to anaesthetized the maxillary molars and its correlation with the postoperative pain. Buccal infiltration alone and buccal with palatal and intraligamentary infiltrations are commonly used techniques to anaesthetize maxillary molars for endodontic purpose. The present survey showed that dentist up to 10 years of clinical experience used BI alone in most of the cases (around 62% of clinicians). Dentist between 10-20 years of clinical experience used both BI and BI+PI to the same extent [Table/Fig-1]. However senior dentist with clinical experience of more than 20 years, use BI+PI more frequently (around 63% of clinicians). Very few dentists (5.52%) opted for BI+IL to anaesthetize maxillary molars for endodontic purpose. This was in contrast to previous bulgerian study in which 46% of senior dentist opted for the intra-ligamentary technique [20]. Avoidance of intraligamentary infilteration is attributed to certain challenges in injection technique such as positioning the needle within desired location, controlling the placement of needle throughout the administration phase of anaesthesia, increased pain in the patients due to high syringe pressure with consequent tissue damage, inability to control the correct amount of anaesthesia to be delivered, unpredictability of duration of effect of anaesthesia, etc.

General practitioners (62% of clinicians) preferred to give palatal infilteration along with buccal infilteration for endodontic purpose [Table/Fig-2]. This is because general practitioners may correlate root canal treatment of maxillary molars with extraction in which both buccal and palatal infilterations are needed. Endodontists and other speciality practitioners don't prefer to give palatal infilteration. It may be because it is very painful injection technique owing to the tight binding of mucoperiosteum with bone. Success of anaesthesia was evaluated by absence of pain during root canal treatment. Buccal infilteration with supplemental anaesthesia in the form of palatal (82%) and intra-ligamentary infilteration (88%) showed higher success rate compared to only buccal infilteration (69%) [Table/Fig-3]. This was in contrast with the previous study conducted by Agarwal et al., according to his study, there was no statistical difference between the anaesthetic success of posterior superior alveolar nerve blocks (64%), buccal infiltrations (54%), and buccal plus palatal infiltrations (70%) [3]. In various previous studies, supplemental PDL injection showed successful pulpal anaesthesia in 50-96% of cases for endodontic procedures [21] But, most of the times, a re-injection is advisable for good result [21] Moreover, BI+IL group showed higher rate (75%) of postoperative pain at 72 hour follow-up [Table/Fig-4]. Contrary to this in previous study only 28% of respondents observed development of complications. The prepared questionnaire seems to be very valid for the study as all questions are simple, factual, objective type and guides the study directly towards its goal.

LIMITATION

According to authors, there are certain limitations of the conducted study. Total 290 dental respondents selected in the study may not be truly representative of the Western Maharashtra dentist. Moreover, there is a chance of variability in assessing the pain response of patient as the investigator has to rely on dentist.

CONCLUSION

Taken together, these results suggest that general practitioners (62% of clinicians) prefer to give both buccal and palatal infilterations and specialists opt for only buccal infilteration (66-74% of specialists) for performing root canal treatment in maxillary molars.

RECOMMENDATIONS

Routinely use of supplemental anaesthesia in the form of palatal and intra-ligamentary infilteration is not necessary for carrying out endodontic treatment in maxillary molars unless patient experiences discomfort during endodontic treatment. Additionally, avoid use of intra-ligamentary infilteration as it may lead to higher incidence of postoperative pain.

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PARTICULARS OF CONTRIBUTORS:
1. Assistant Professor, Department of Conservative Dentistry and Endodontics, SDCH Pune, India.
2. Senior Resident, Department of Conservative Dentistry and Endodontics, Centre for Dental Education and Research, All India Institute of Medical Sciences, New Delhi, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Ganesh Ranganath Jadhav,
Assistant Professor, Department of Conservative Dentistry, SDCH, Pune, India.
E-mail: drganesh2009.aiims@gmail.com

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