

## Knowledge on periostome and atraumatic extraction among dental students

R. Shasmitha<sup>1</sup>, Kathiravan Selvarasu<sup>2\*</sup>

### ABSTRACT

**Aim:** The aim of this study was to understand the knowledge of dental students on periostomes in non-surgical tooth extractions. **Materials and methods:** An annexure a questionnaire was distributed among 200 dental students practicing in Saveetha Dental College. An annexure A questionnaire (Picture 1) was distribute among 200 dental students practicing in Saveetha dental college. The three criteria namely the familiarity of the periostome, principles of periostome and the principles of atraumatic extraction are considered based on questionnaire level. The final results are graphically analyzed. **Results:** This study depicts the knowledge about periostomes and its uses among the undergraduate students of Saveetha Dental College. As we already discussed, the awareness of atraumatic extractions should be made possible on a wide scale even for new practitioners onto the field. The importance of atraumatic extraction is not only reducing the post-operative pain but also aids in maintaining the gingival collar and fast healing and puts less pressure on the buccal and lingual/palatal cortices of the bone. Only 50% of the dental students have the knowledge about atraumatic extraction and the aim of any extractions, because the importance of atraumatic extractions has not been stressed enough [Graph 1]. 51% of them know the use of a periostome and their function, and they understand that periostomes aid in relieving the periodontal ligaments by tearing them from bone socket to the tooth [Graph 2]. Only 42% of the students know that periostome was used before immediate implant placement, and the remaining 48% thinks that the periostome is the same of an elevator and its function is elevated. **Conclusion:** This study clearly reveals the knowledge on atraumatic extractions, various methods of atraumatic extractions and on periostomes is less amongst the undergraduate students of Saveetha Dental College. We understand that the basic principle of any extraction is to do no harm to the healthy parts of the tooth. This can be achieved with atraumatic extractions performed using periostomes and luxators, encouraging the same during routine clinical practices Awareness on atraumatic extractions with the importance of soft tissue, gingival contour and preservation of bone volume should be emphasized to the undergraduate students and give opportunities in clinical practices to observe, study and practice along with theoretical knowledge in atraumatic extractions

**KEY WORDS:** Atraumatic extraction, Extraction, Gingival fibers, Periodontal fibers, Periostome

### INTRODUCTION

Tooth extraction is a painless surgical procedure mostly performed under local anesthesia. However the soreness and pain due to tooth extraction last for several days. A complex cascade of biochemical and histologic events then ensues during the wound healing process which further leads to physiologic alterations to alveolar bone and soft-tissue architecture.<sup>[1-3]</sup> During the extraction procedure, basic surgical techniques must be followed, and the clinician must be prepared to manage complications. While traditional dental

extraction techniques encourage minimal trauma, luxation elevation and forceps removal often result in fracture or deformation of the dentoalveolar housing. Basic exodontia principle is often advocated that the trauma should be kept to a minimum and where bone preservation is typically a secondary concern. This trauma typically results in post-extraction ridge defects that may preclude treatment with dental implants or results in subpontic food traps when traditional fixed partial dentures are used. These problems may be avoided with “atraumatic” extraction techniques. Atraumatic extraction preserves bone and gingival architecture and allows for the option of future or immediate dental implant placement. A number of tools and techniques have been proposed for minimally invasive tooth removal namely the Easy

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<sup>1</sup>Department of Oral and Maxillofacial Surgery, Saveetha Dental College, Saveetha University, Saveetha Institute of Medical and Technical Sciences, Chennai, Tamil Nadu, India, <sup>2</sup>Department of Oral and Maxillofacial Surgery, Saveetha Dental College, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India

\*Corresponding author: Kathiravan Selvarasu, Department of Oral and Maxillofacial Surgery, Saveetha Dental College, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai – 600 077, Tamil Nadu, India

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X-Trac System (Titan Instrument, Hamburg, New York, USA), Physics Forceps (Surgical Solutions USA, Carlsbad, California, USA), #15 scalpel blades, periostomes, the use of hard-tissue graft materials derived from a variety of sources, graft-stabilizing membranes, as well as soft-tissue grafts, which reduces the degree of damage and extent of resorption that physiologically occurs following tooth extraction.<sup>[4,5]</sup> Periostomes are extraction instruments that employ the mechanisms of “wedging” and “severing” to facilitate tooth removal.<sup>[6-8]</sup> Periostomes

are composed of very thin metallic blades that are gently wedged down the periodontal ligament (PDL) space in a repetitive circumferential fashion. In addition to minimally invasive luxation, the periostome blade severs Sharpey’s fibers that secure the tooth within the socket. The extraction socket with an undamaged alveolus and well-preserved soft tissues can be successfully treated with immediate implant placement. Surgical extrusion by periostome also avoids the consequences of extensive resective surgery and orthodontic extrusion such as uneven

- 1) The most important aspect of any surgical procedure is:
  - A) Setting up the treatment room
  - B) Discussing the financial arrangements
  - C) The pre operative assessment
- 2) What do you think is the aim of a tooth extraction?
  - A) Permits efficient procedures
  - B) Minimise trauma to the surrounding structures and discomfort.
  - C) Encourage rapid healing
  - D) All the above
- 3) The likelihood of failure to tooth extraction can be due to:
  - A) Restricted mouth opening of the patient
  - B) Crown - Root fracture
  - C) Infections
  - D) All the above
- 4) Teeth with the short tapering roots will be much difficult to extract than those with long, bulbous roots:
  - A) True
  - B) False
- 5) Care must be taken to preserve as much bony support (especially the buccal cortical plate) in order to:
  - A) Keep soft tissue at a good biologic and esthetic level.
  - B) Decrease the time involved with the procedure.
  - C) Prevent the collapse of the bony socket.
  - D) Both A and C
- 6) Fracture of the buccal plate will increase the rate and amount of resorption of the alveolar ridge following extraction of the maxillary incisors:
  - A) True
  - B) False
- 7) The extraction of maxillary canines can be very difficult even when they are fully erupted due to their extremely long roots and thin buccal cortical bone overlying the root.
  - A) True
  - B) False
- 8) Root tips must be luxated in order to be removed.
  - A) True
  - B) False
- 9) Periostome can be used for:
  - A) Atraumatic anterior tooth extraction
  - B) Atraumatic posterior tooth extraction
  - C) Sever the gingival and periodontal fibers
  - D) Both A and C
- 10) Important application of periostome is:
  - A) Before immediate implant placement
  - B) Elevation of the tooth
  - C) None of the above.

Picture 1: Questionnaire annexure A

gingival margins, loss of interdental papilla, relapse, and several fiberotomy sessions. The procedure is like the blade of the periosteal elevator was placed in the PDL space of the tooth to be treated and manipulated in a “walking motion” to luxate the tooth.<sup>[9-14]</sup> The tooth was carefully extruded to the desired position using a hemostat and placed at a level such that the fracture margin was situated at least 3–5 mm from the alveolar crest. The simple interrupted sutures were employed for the closure of flaps.

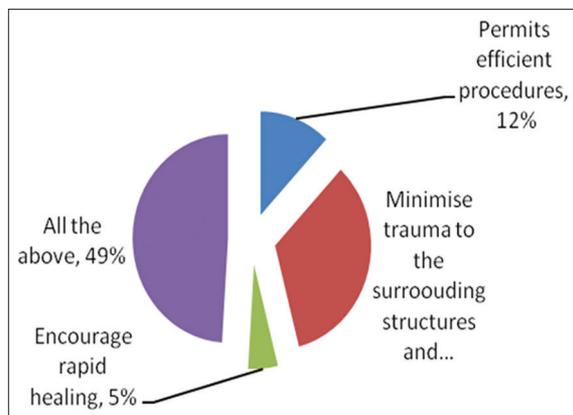
## MATERIALS AND METHODS

An annexure A questionnaire [Picture 1] was distributed among 200 dental students practicing in Saveetha Dental College. The three criteria, namely the familiarity of the periosteal elevator, principles of periosteal elevator, and principles of atraumatic extraction, are considered based on questionnaire level. The final results are statistically analyzed.

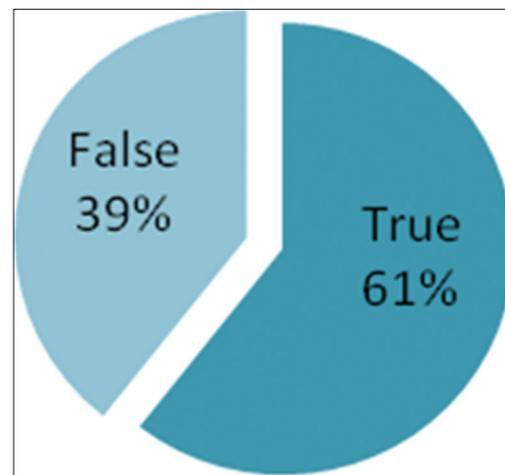
## RESULTS

This study depicts the knowledge about periosteal elevators and its uses among the undergraduate students of Saveetha Dental College. As we already discussed, the

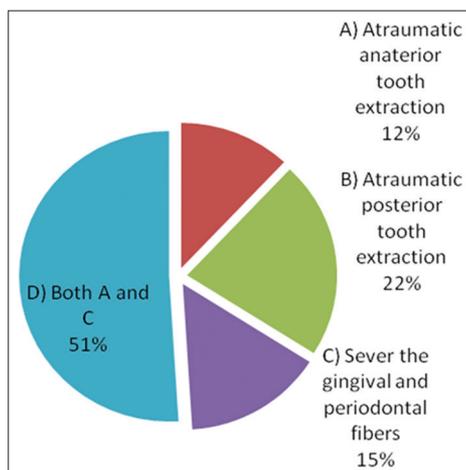
awareness of atraumatic extractions should be made possible on a wide scale even for new practitioners onto the field. The importance of atraumatic extraction is not only reducing the post-operative pain but also aids in maintaining the gingival collar and fast healing and puts less pressure on the buccal and lingual/palatal cortices of the bone. Only 50% of the dental students have the knowledge about atraumatic extraction and the aim of any extractions, because the importance of atraumatic extractions has not been stressed enough [Graph 1]. 51% of them know the use a periosteal elevator and their function, and they understand that periosteal elevators aid in relieving the PDLs by tearing them from bone socket to the tooth [Graph 2]. Only 42% of the students know that periosteal elevator were used before immediate implant placement, the remaining 48% assumed that periosteal elevator is same of an elevator and its function is elevation, more over they did not know the operator handling of periosteal elevator to perform atraumatic extraction [Graph 4], whoever they do not know about the method in how to use the periosteal elevator and the procedure of handling it. Most of the students state that root tips should be luxated for better atraumatic extraction and also it has been perceived that extraction of maxillary canines is difficult due to long roots, and the presence of thin



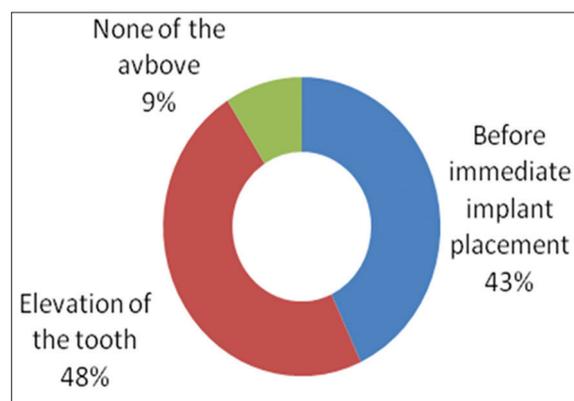
Graph 1: Principles of atraumatic extraction



Graph3: Factors influencing the failure of tooth extraction perceived by the students



Graph 2: Use of periosteal elevators



Graph 4: Importance of periosteal elevator

buccal cortical bone will lead to fracture on pressure elevation or extraction which will, indeed, lead to alveolar ridge resorption but only 48% of the students say that teeth with long bulbous roots are difficult to extract. Students understand that extraction failures are due to improper forceps engaging and handling; moreover, they perceive that elevating the buccal and lingual/palatal flaps aids in successful extraction but failed to think that it is necessary to relieve the periodontal and gingival fibres from the bone socket to luxate the tooth which later allows the forceps to aid in extracting the tooth, without putting the forceps into the PDL space. The tooth is extracted, and here, the use of a slow gentle rotation pulling force is preferred, which in case periotome was used [Graph 3].<sup>[15-17]</sup>

## DISCUSSION

Recently, there has been a great interest in atraumatic extractions, which grabs the desire for dentists wanting to do immediate dental implant placement. Atraumatic extractions are desired more and more to preserve bone for immediate implant placement. In general, the benefit of dental implants is solid support for the patient's new teeth, which require the bone around the dental implant to heal.<sup>[18]</sup> Depending on how the tooth extraction is performed, the healing time required can vary greatly, hence the desire to perform an atraumatic extraction. Hence, it is very essential to perform atraumatic extractions.<sup>[19]</sup> Deliberately, many students have the knowledge on atraumatic extraction but do not know the various methods of atraumatic extractions or the use of periotome. The students know that periotome was used before immediate implant placement, and the remaining 48% thinks that the periotome is the same of an elevator and its function is elevated; however, the principle of the periotome is severing of the gingival fibers and periodontal fibers. Most of the students only used the conventional forceps and periosteal elevators for extractions, they do not have exposure to atraumatic extraction tools or methods. Hence, it is important to know the basics of atraumatic extractions and perform atraumatic extractions in future with preserving the surround structures, permitting rapid healing, and providing comfort to the patient.

## CONCLUSION

This study clearly reveals the knowledge on atraumatic extractions, various methods of atraumatic extractions, and periotomes. We understand that the basic principle of any extraction is to do no harm to the healthy parts of the tooth. This can be achieved with atraumatic extractions performed using periotomes and luxators, encouraging the same during routine clinical practices. Thorough preoperative assessment should be performed to avoid complications

during procedure due to systemic or local factors. Exclusion criteria remain the same for any extraction irrespective of using a periotome or luxators. A complete assessment should be to eliminate any difficulties both to the patient and the practitioner. Using proper instrumentation and knowing where the complications arise, both are the very important aspects of efforts to give a patient the best possible outcome.<sup>[20]</sup> Awareness on atraumatic extractions with the importance of soft tissue, gingival contour, and preservation of bone volume should be emphasized to the undergraduate students and give opportunities in clinical practices to observe, study, and practice along with theoretical knowledge in atraumatic extractions. Students should encourage themselves to study and practice and to handle different circumstances. In case of immediate implant, students should have clinical observations of the procedure and should understand that the preservation of marginal soft tissue contours is an important consideration in the esthetic zone, particularly, in cases with thin labial plate of bone. Under normal circumstances, tooth extraction alone in these areas will result in loss of labial plate and soft tissue collapse into the extraction socket within a matter of weeks, resulting in loss of bone volume and gingival contour.

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