

Comparison Of The Clinical Efficacy Of Two different Extraction Techniques In The Removal Of Impacted Maxillary Third Molar

Research Article

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Abstract

Purpose: The aim of the study was to assess and compare the effectiveness and efficiency of JOEDD's technique to the conventional forceps' technique in the extraction of a fully erupted maxillary third molar.

Materials and Methods: The present study was conducted on 30 patients requiring extraction of fully erupted maxillary third molars attending the Out patient Department of Oral and Maxillofacial Surgery. The study plan was a prospective single blinded study. The selected patients were randomly placed in to two groups in accordance with randomization plan. JOEDD's technique of extraction was used on Group 1 patients where as Conventional forceps were used for extraction on Group 2 patients. Duration of the procedure, patient compliance, trauma to the surrounding soft and hard tissue were evaluated. Statistical analysis of the recorded and compiled data was done.

Results: It was observed from the present study on analysis of 30 patients based on parameters showed that JOEDD's technique had minimal trauma to surrounding soft and hard tissues, time taken for extraction was under 2 minutes and less root and tuberosity fractures while compared to the other group of study.

Conclusion: For the extraction of maxillary third molar, JOEDD's technique has proved to be better in comparison with the conventional maxillary third molar with minimalized complications provided the right selection of cases and techniques are used. Its use can revolutionize the technique of modern usage for the extraction of maxillary third molars.

Keywords: Extraction; Maxillary Third Molar; Joedd's Technique; Forceps Extraction.

Introduction

Extractions are the most common procedures in the normal routine of a dental surgeon. Traditional extraction techniques use a combination of severing the periodontal ligament, luxation of the tooth using an elevator and removal using forceps. If the elevator fails in achieving adequate separation of the tooth from within the socket, forceps accomplishes the work by inducing intermittent lateral and apical forces which help in the ease of removal of the tooth from within the socket. The conventional method of extracting a fully erupted maxillary third molar is by using the Universal #210 forceps.

Dr. Joseph Edward describes a technique (JOEDD's technique) in which #217 lower cow horn forceps is used for the luxation of the maxillary third molars. The two beaks of #217 cow horn forceps engage interdental between the second and third molar which acts as a wedge down the periodontal ligament, tears the fibers and luxates the tooth from within the socket.

The aim of the study is to assess and compare the effectiveness and efficiency of JOEDD's technique to the conventional forceps' technique in the extraction of a fully erupted maxillary third molar. Duration of the procedure, patient compliance, trauma to the surrounding soft and hard tissue are evaluated.

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Materials and Methods

The present study was conducted on 30 patients requiring extraction of fully erupted maxillary third molars attending the Out-patient Department of Oral and Maxillofacial Surgery in a time period of 5 months from September 2019 to January 2020. The study plan was a prospective single blinded study.

Patients in the age groups of 20-50 years only were included. Normal healthy patients with type 2-3 bone density (Lekholm and Zarb classification based on RVG) and without any severe systemic disease were included in this study. Exclusion criteria included persons aged less than 20 years and more than 50 years, patients with severe systemic disease, isolated third molars and grossly decayed third molars. All extractions were strictly performed by a single surgeon to rule out inter operative bias. One person was assigned to collect data. Main variables taken were patient compliance, time taken for extraction, trauma to surrounding soft tissues, root fracture and tuberosity fracture.

The distribution of sex and age of the patients participated in the present study is shown in Figures 1 and 2. Prior to extraction, a brief history of every patient was taken to select cases as per inclusion and exclusion criteria.

Following measurements were made for the patients.

1. Patients compliance was recorded using non-calibrated 100 mm visual analogue scale (VAS) on the operative day, 1st post-operative and the 3rd post-operative day. The upper and lower limit of the scale were 'no pain' and 'pain could not be worse' respectively.

2. Time taken for the extraction using a digital stop watch.

Patients were divided equally according to gender. Sequentially numbered opaque sealed envelopes were allocated with data as odd and even numbers. Data with odd numbers underwent conventional forceps technique and with even numbers underwent Joedd's technique.

Armamentarium: The lower cow horn forceps (#217) is typically used for the removal of carious mandibular molar with extensive destruction of crown structure but with an intact furcation designed to function according to the wedge principle below the crest of the bone engaging in to the furcation. The control group used Upper third molar forceps (#210), conventionally used for the removal of erupted maxillary third molar.

Observation and Results

The measurements and recordings for patient compliance, time taken for the extraction, trauma to surrounding soft tissues, root fracture and tuberosity fraction were made on the scales designed for the purpose. The data recorded was compiled and put to statistical analysis.

Patient Compliance

Mean value of patient compliance on a Visual Analog Scale(VAS) [Table 1].

Figure 1. 60% Female and 40% Male.

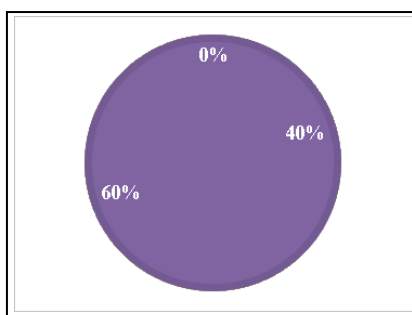
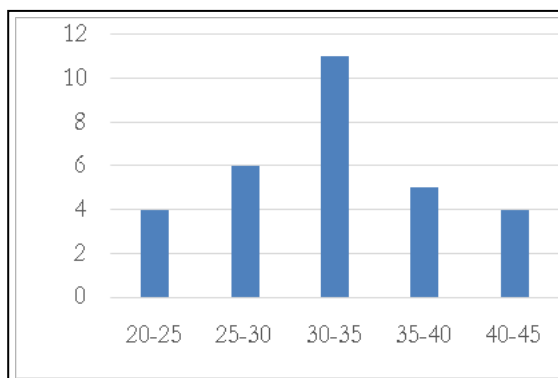


Figure 2. Age of the patient.



Time, Trauma To Surrounding Soft Tissues, Root Fracture and Tuberosity Fracture:

Time, Trauma to surrounding soft tissues, Root fracture and Tuberosity fracture can be tabulated based on the values obtained [Table 2].

Discussion

In the course of extraction of a tooth, there is expansion of the dento-alveolar bone which surrounds the socket and severing of the periodontal ligament attached to the tooth. Along with these physical changes that occur in the course of extraction, there are more importantly, biochemical changes with in the tooth socket. Periodontal ligament, once severed or traumatized using forceps or elevators results in the release of hyaluronidase locally. Hyaluronidase aids in the catalysis of a chemical called hyaluronic acid, a substantial element of a wide range of human tissues extracellular matrix including the periodontal ligament.

As the periodontal ligament is chemically broken down by hyaluronidase, the tooth slowly gets released in attachment to the alveolus which facilitates easy removal using forceps or elevators. The amount of hyaluronidase released per unit time is directly proportionate to the ease of removal of tooth and inversely proportional to trauma caused to the alveolar bone.

Physics Forceps by Golden-Misch works in this principle as it creates with sturdy unslaked pressure on the periodontal ligament, significantly creating a greater release of hyaluronidase in a period of time much shorter than the time required using a traditional third molar forceps or elevators. This is again supported by the fact that the trauma from those techniques are intermittent in nature [5].

Conventional methods of third molar extraction leads to a wide range of complications both intra and post operatively. Luxation of the adjacent tooth when its used as a fulcrum, fracture of the maxillary tuberosity. Complications that occur post-operatively include infections, alveolitis sicca, radix in antro highmori etc. [1], [7-11]. Use of elevators in the extraction of maxillary third molars are very helpful, but its misuse can lead to many complica-

tions such as injury to the soft tissues including injury to floor of mouth, tongue, hard and soft palate which is usually caused due to the slipping of elevators during the course of its use [1].

Excessive load or wrongful application of force often leads to the fracture of the bone especially at the angle of the mandible [12-14]. Extraction of the upper third molar may lead to the fracture of the maxillary tuberosity [3, 4]. Displacement of roots in to the infratemporal fossa, buccal soft tissue, submandibular space, maxillary sinus or inferior dental canal can occur if uncontrolled forces are dissipated. Instrument breakage of the working blade may cause postoperative infection and delay in wound healing [1, 2, 12].

Over time memorandum, many techniques were in practice to minimize complications arising with tooth removal. Over decades extraction in hemophilic patients were done by rubber bands known as rubber band extractions. Orthodontic elastics were used for the atraumatic extraction of teeth in patients treated with bisphosphonate by Regev et al [15]. A comparison (split-mouth) in the use of physical forceps and extraction forceps in orthodontic extraction of maxillary premolars were conducted by Hariharan et al [16] which concluded that a lower visual analogue scale (VAS) score for pain was obtained by the physical forceps in the first post-operative day with no other differences in inflammatory and operative complication and operation time arising between the two groups. A new surgical protocol was introduced by Karl Schumacher with the use of apical instrumentation with focus on occlusal movement of tooth while extraction. This technique helps in preservation of the hard and soft tissues allowing the removal of the most broken-down tooth in a non-flap (closed) technique [17]. Taking in to consideration, all the above-mentioned factors and techniques used over time for the extraction of teeth, a new technique for maxillary 3rd molar extraction has been tried with the use of mandibular cowhorn forceps.

This technique minimizes chances of maxillary tuberosity fracture, slippage of tooth, soft tissue tears along with the requirement of a lower amount of force ensuring that all standard extraction protocols are followed in the course of the procedure.

Minimal chance of occlusal displacement of the adjacent 2nd mo-

Table 1. Mean value of patient compliance on as recorded on visual analog scale (VAS).

Group	Pre-Operative	1 st POD	3 rd POD
Experimental	0.00	25.74	11.83
Control	0.00	51.26	28.34

Table 2. Measured parameters and mean values for experimental and control group.

Parameters	Experimental group		Control group	
Time taken for extraction	1min 48 sec ± 30 sec		3 mins 29 sec ± 45 sec	
Trauma to surrounding tissue	Mild		Moderate	
	Left	Right	Left	Right
Root fracture	1	0	2	2
Tuberosity fracture	1	1	3	2

lar if not adequately supported is a disadvantage of this technique. If the beaks of the lower cowhorn forceps are not in the interdental area of the maxillary third molar or if the force dissipation is incorrect, it may cause the fracture of the distal segment (cusp) of the 2nd molar which we have not encountered in the course of the study. An increased incidence of tuberosity fracture and root fracture were reported in the current study as even <3mm of fractured alveolar bone or its removal with the roots of third molar were an inclusive criterion in the category of fractured maxillary tuberosity and tooth with all forms of root shapes even those with severe dilaceration were extracted and considered a part of the study.

Conclusion

This technique utilizes the use of #217 lower cowhorn forceps for the extraction of maxillary 3rd molars which helps reduce complications arising with the use of conventional forceps technique. This ensures greater patient compliance and ease of acceptance along with minimum trauma and shorter procedure time. This technique however, cannot be used in extraction of tooth with proximal caries or grossly decayed second or third molar.

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