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A Modified Cryer Elevator During Removal of Roots in Impacted Mandibular Third Molar Surgery

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Abstract

The most important aspect of impacted mandibular third molar surgery or in complicated exodontia is removal of roots. Based on our clinical experience, we modified the cryer elevator and compared with normal cryer elevator during surgical removal of roots in bilateral symmetrical impacted mandibular third molars. Therefore, a randomised single blind clinical trial was designed to analyze the efficacy of modified cryer elevator. Thirty-six patients with bilateral identical impacted lower third molars requiring surgical removal, under local anaesthesia, were included. A standard surgical protocol was followed. Roots were removed using Cryer elevator on one side and modified cryer elevator on the other. The ease of the removal of roots (easy, moderate and difficult) and time interval from the start of buccal guttering until removal of roots out of the socket were noted. The difference in ease of removal of roots (p =0.03) and duration (p<0.001) was statistically significant between the two elevators. We conclude use of modified cryer elevator is effective in surgical extraction of impacted mandibular third molars.

Keywords: Cryer Elevator, Elevator, Impacted Tooth, Mandibular Third Molar, Roots

1. Introduction

The success of impacted third molar surgery depends on good reflection, proper guttering, sectioning of tooth, selection of elevator, and removal of roots at the end. A variety of flap designs[1], local anaesthetics[2,3], sedation[4], surgical techniques[5–10], antibiotics[11–14], analgesics[15,16] and radiographic techniques[17,18] have been described to improve the impacted third molar surgery. We focused on instruments used for removal of impacted lower third molars. Cryer elevator is a triangular shaped elevator commonly used to deliver roots out of the socket[19,20]. It works on rotational or wheel or axle type of motion[19,20]. Roots of impacted lower third molars sometimes finds difficult to remove. Proper training, skill and experience are necessary to extract impacted mandibular third molars. Based on our clinical experience, we modified the cryer elevator and compared with normal cryer elevator during surgical extraction of impacted mandibular third molars.

2. Materials and Methods

Thirty-six patients (16 men and 20 women) aged between 20 and 30 years with bilateral symmetrical mandibular third molars requiring either prophylactic or symptomatic extraction who reported to the dental unit between October 2015 and October 2016, were included. The study protocol followed a prospective, randomised, single blind clinical trial. The collage ethics committee approved the study protocol and written informed consent was obtained from all of the patients before the procedures.

Patients with bilateral identical impacted lower third molars that had a similar difficulty index (Figure 1) were included. Patients with any systemic problems or impacted teeth associated with any pathological conditions or any cardiac problems or immunocompromised conditions were excluded from the study.

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Figure 1: Bilateral symmetrical impacted third molars.

2.1. Design of the Instrument

The triangular shaped blade of the cryer elevator (Figure 2) is modified by creating a V shape cut as shown in (Figure 3). The blade of this modified elevator has two sharp triangular shaped points which helps to deliver roots out of the socket.



Figure 2: Triangular saped blade of cryer elevator.

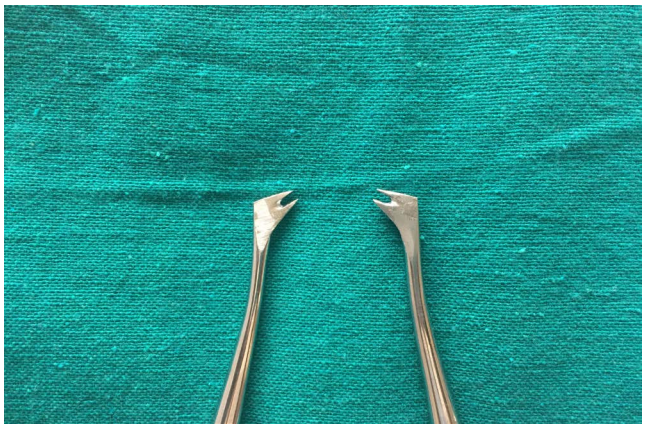


Figure 3: Modifiedcryer elevator.

2.2. Technique

All patients were infiltrated with 2% lignocaine hydrochloride with adrenaline. A classic inferior alveolar nerve block and long buccal nerve block was given. A standard surgical protocol was used to remove impacted third molars using hand piece.

During surgical removal of impacted teeth, if required the crown was sectioned from the roots of the impacted tooth and delivered out from the socket. The roots of the tooth are then delivered together or independently by either elevator using rotational or wheel and axle type of motion having judicious amounts of force to prevent complications. (Figures 4 and 5) showing use of modified cryer elevator during removal of roots of impacted third molars. Postoperatively all patients were received a treatment regimen of antibiotics and analgesics for five days.

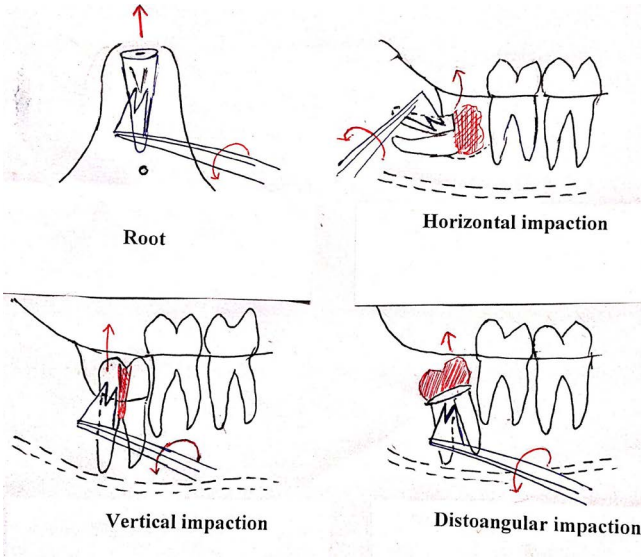


Figure 4: Use of modified cryer elevator during removal of root in impacted teeth.



Figure 5: Modified cryer elevator with tooth root.

2.3. Randomization

In all patients, cryer elevator was used on one side (control side) to remove roots and modified cryer elevator on the other side (treatment side) with a two-week interval in between. The same surgeon performed surgery on all the patients. The choice of elevator for the first operation to remove roots was randomised (by the toss of a coin) and other elevator for the second site.

2.4. Parameters

We recorded ease of removal of roots rated as easy, moderate, and difficult. The time interval from the start of buccal guttering until removal of roots out of the socket was noted (any discomfort encountered during the procedure, stopwatch was stopped and time was noted and continued thereafter once interruption was cleared).

2.5. Statistical Analysis

The data collected were recorded, tabulated and analysed statistically using SPSS version 18.0 software (SPSS Inc., Chicago, IL, USA). The difference between the two groups was measured using the Chi-square test and Independent *t* test. Significance value was set at the 0.05 level ($p < 0.05$).

3. Results

We studied 36 patients who required bilateral surgical removal of impacted mandibular third molars. The difference in ease of removal of roots (p=0.03) and duration (p<0.001) was statistically significant between the two elevators.

With regard to ease of removal of roots, most of the patients had easy removal with modified cryer elevator (n=26) when compared with normal cryer elevator (n=15). Moderate difficulty was seen in 6 patients with modified cryer elevator when compared with 10 patients with normal cryer elevator. With regard to difficult removal, 11 patients had difficulty in removal of roots with normal cryer elevator when compared with 4 patients with modified cryer elevator. The difference was statistically significant between the two elevators (p=0.03). Mean time for removal of roots was more with cryer elevator (29.61 ± 1.28) compared to modified cryer elevator (24.78 ±. 1.09), p< 0.001.

4. Discussion

The common surgical procedure performed in oral and maxillofacial surgical speciality is the removal of impacted teeth. Proper training, experience and skill are necessary to remove these teeth. Maxillofacial surgeons perform the surgical removal of impacted teeth more comfortably and scientifically if they determine in advance just what problems they will encounter. Sometimes, roots of impacted teeth are difficult to remove leading to damage of alveolar bone, bony walls and injury to neurovascular bundle. One of the major complications is fracture of jaw during surgical removal of impacted teeth[21].

Elevators are instruments used for luxation roots which are either visible or buried in the bone. Elevator deliver root out of the socket which cannot be grasped by the blades of the forceps.[19,20] Inappropriate grasp with elevator leads to damage of adjacent vital structures like lingual nerve, tongue, floor of the mouth or forcing roots into nearby inferior alveolar canal or tissue spaces[21]. Therefore, we modified cryer elevator which can engage roots firmly during surgical removal of impacted teeth.

Cryer elevators are pair of instruments that has a single triangular shape blade[19,20] whereas modified cryer elevator has two triangular shape blades. Although Cryer elevator engages the roots to deliver out of the socket, sometimes cryer elevator may not engage the root properly and while an attempt to remove lead to damage of adjacent alveolar bone within the socket (Figure 6) especially buccal and lingual cortical bone. Therefore, we modified the triangular shaped blade of cryer elevator to facilitate easy removal of roots of the impacted teeth and in complicated exodontia. In the present study, most of the patients had easy removal of roots and mean duration was less with modified cryer elevator.

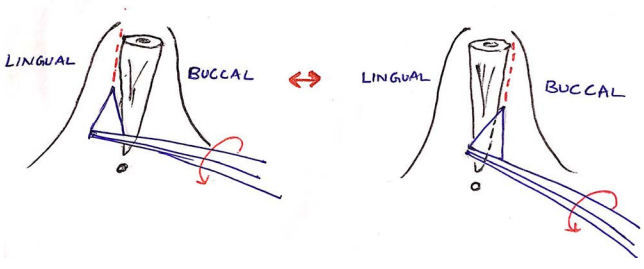


Figure 6: Sometimes cryer elevator may not engage the root properly damaging buccal and lingual alveolar bone.

5. Conclusion

We have been using this modified instrument successfully over the past 2 years. The two sharp triangular shaped points of the modified cryer elevator blade engage the root firmly to deliver it out of the socket. There have been no complications in any patient. Therefore, we recommend modified cryer elevator for management of impacted mandibular third molars.

Funding

None.

Competing interests

None declared.

Ethical approval

Written informed consent was obtained from all patients before the procedure.

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