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**Comparative Study of Piezoelectric and conventional Rotary
Osteotomy Techniques for surgical removal of Impacted
Mandibular Third Molars (Clinical Study)**

A thesis submitted to the council of the College of Dentistry at the
University of Baghdad, in partial fulfillment of requirements for the
Degree of Master of Science in Oral and Maxillofacial Surgery

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Abstract

Background: Impacted lower third molars surgery is frequently encountered in clinical work. Many attempts have been made to reduce postoperative complications. As bone removal is necessary for extracting the third molars that are impacted in bone, hence, it is necessary to choose surgical instruments that conform to anatomic landmarks and are based on physiological principles which may decrease the post-extraction complications. Traditional rotary cutting instruments are potentially injurious. So piezosurgery, as a new osteotomy technique, has been introduced in oral and maxillofacial surgery for atraumatic, precise and selective bone cutting.

Aims: The purpose of this study was to compare the use of ultrasound piezoelectric device and conventional rotary instruments in impacted lower third molars osteotomies and their effect on postoperative trismus, swelling and pain.

Materials and methods: This non-randomized prospective and controlled clinical trial was performed between January 2017 & September 2017. A total of 37 healthy adult individuals (21 male and 16 female) were included in this study. They were in need of surgical removal of their (40) impacted mandibular third molar teeth. Individuals were divided into a study group and a control group, (20) impacted mandibular third molar teeth for study group, where piezoelectric osteotomy technique was used and (20) impacted mandibular third molar teeth for control group, where conventional rotary osteotomy technique was used. Assessment of trismus and swelling was done by measuring the maximum mouth opening and the distance between five predetermined points (tragus, angle of mouth, pogonion, lateral angle of eye and angle of the body of mandible) respectively. These measurements were done before surgery as a baseline record as

well as at the third and seventh day postoperatively. Pain was evaluated by the numeric rating scale along the seven days following the surgery. All these variables in addition to the time of operation were compared between the two groups.

Results: The time taken for removal of impacted tooth by rotary technique was less than time taken in piezoelectric device, which was significant statistically ($p < 0.05$). Mouth opening was better in the piezoelectric group as compared with rotary technique but the statistical result was non-significant. Swelling was less in the piezoelectric group but it did not reach a significant level except in the region of tragus _ mouth. Severity of pain experienced was more in the rotary group but it was non-significant statistically while reached a significant level at the sixth day where ($P < 0.05$) and high significant results were obtained in the seventh day postoperatively ($p < 0.01$).

Conclusions: There is a trend of less trismus, swelling and pain when using piezoelectric device for osteotomy of impacted lower third molars as compared with traditional rotary handpiece although, they did not reach significant level statistically. The piezosurgery method reduces postoperative pain, trismus, and swelling despite the increasing time of surgery in piezoelectric group.