

PIEZOELECTRIC VERSUS CONVENTIONAL ROTARY TECHNIQUE FOR SURGICAL EXTRACTION OF HORIZONTALLY IMPACTED MANDIBULAR THIRD MOLAR (A RANDOMIZED CONTROLLED CLINICAL TRIAL)

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INTRODUCTION

Impacted mandibular third molar extraction is a common procedure in dental surgery. The conventional technique involves using manual and/or rotary instruments to perform osteotomy and odontectomy, allowing dental extraction with a shorter intervention time and reduced patient anxiety.(1) New surgical techniques and innovative technologies have greatly improved the predictability and reduced the invasiveness of oral surgery procedures. Piezoelectric bone surgery (PBS) was introduced into clinical practice almost 20 years ago.(2)

METHODOLOGY

Sixteen patients with horizontally impacted lower third molars in class II position B (3) indicated for surgical extraction were treated randomly using either the piezo-surgery (4) or the conventional bur technique. (5)

Duration of the procedure, soft tissue healing, postoperative edema, trismus, pain, and bone density were evaluated.

Post operative pain was evaluated as mean VAS score. (5)

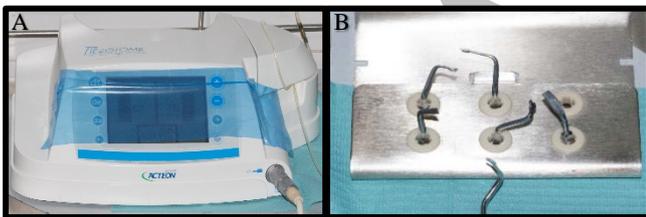


Figure (1): (A) Piezotome. (B) Piezo-electric device tips.

RESULTS AND DISCUSSION

All patients were clinically evaluated starting from the first postoperative day till the seventh postoperative day. Study and control groups were compared using paired t-test. They showed soft tissue healing with absence of any signs of infection. There was statistical significance in reduction of pain (table 1), trismus (table 2), and swelling in study group, where the time of the procedure was statistically increased in study group. For bone density, statistical difference was found where study group showed better results.

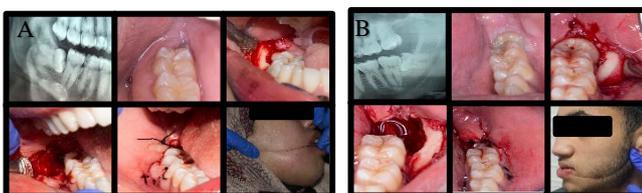


Figure (2): (A) Surgery using conventional rotary method
(B) Surgery using piezotome

Table (1): VAS mean score

	Mean (SD)		P value of paired t-test
	Study	Control	
After 1 day	3.8(0.68)	6.5(0.51)	< 0.001*
After 3 days	2.6(0.5)	5.4(0.52)	< 0.001*
After 7 days	1.2(0.47)	4.6(0.52)	< 0.001*

Table (2): Trismus (limited mouth opening) mean value (cm)

	Mean (SD)		P value of paired t-test
	Study	Control	
After 1 day	3.6(0.2)	2.5(0.3)	< 0.001*
After 3 days	3.8(0.23)	2.8(0.2)	< 0.001*
After 7 days	4.4(0.15)	3.6(0.2)	< 0.001*

CONCLUSION

With the limitations of this study, it can be concluded that piezo-surgery reduces postoperative pain, trismus, and swelling and improves the postsurgical soft tissue healing and bone formation. Also, it may play an important role in increasing bone density within the extraction socket and decreasing the amount of bone loss during operation. The only disadvantage encountered in the study is the elongation of surgical time.

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REFERENCES

1. M. Cicciu`, C. Stacchi, L. Fiorillo, G. Cervino, G. Troiano, T. Vercellotti, A.S. Herford, P. Galindo-Moreno, R. Di Lenarda: Piezoelectric bone surgery for impacted lower third molar extraction compared with conventional rotary instruments: a systematic review, meta-analysis, and trial sequential analysis. Int. J. Oral Maxillofac. Surg. 2019
2. Stacchi C, Lombardi T, Cusimano P, et al. Bone scrapers versus piezoelectric surgery in the lateral antrumotomy for sinus floor elevation. J Craniofac Surg 2017;28:1191–1196.
3. Jaron A, Trybek G. The Pattern of Mandibular Third Molar Impaction and Assessment of Surgery Difficulty: A Retrospective Study of Radiographs in East Baltic Population. Int J Environ Res Public Health. 2021 Jun 3;18(11):6016.
4. Lucas M, Mathieson A. Ultrasonic cutting for surgical applications. In: Gallego-Juarez JA, Graff KF, editors. Power Ultrasonics. (Chap. 23), Cambridge: Woodhead Publishing, Elsevier (2015) p. 695–721.
5. Elden, Shady & Hussein, Mansour & Alfakhrany, Abdelmageed. (2018). Piezoelectric versus conventional rotary techniques for impacted lower third molar surgery. Al-Azhar Journal of Dental Science. 21.229235.10.21608/ajdsm.2018.71539.