



A Comparative Evaluation between the Chisel Technique and Micro Motor Technique in Removal of Mandible Impacted Third Molar

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Abstract

Background: Impaction is a condition where the tooth is either partially or completely unerupted, and that which lies embedded in the soft tissue or bone, so that its further eruption is unlikely to occur. Mandibular third molars are the most commonly impacted teeth in the oral cavity followed by the maxillary third molars. This may be attributed to many local reasons like density of bone, lack of space in the jaw, ectopic position of tooth bud, retained deciduous tooth/teeth and few systemic causes like syphilis, rickets and anemia. It may also be hereditary. Surgical elimination of impacted third molar is a very frequent surgical event done in the department of Oral and Maxillofacial Surgery. This study is intended for clinically assessing and evaluating the two efficient techniques. The first technique uses the chisel and mallet while the second technique uses the bur with micro motor. The techniques were compared on the following parameters- pain, swelling, infection, trismus and operation time.

Materials and methods: 40 patients who reported to the OPD in Vivekanandha dental college for women, thiruchengode were considered as the study population. They reported with impacted mandibular third molar. They were haphazardly separated into two equal groups Group I (Surgical procedure performed by Chisel & Mallet) and Group II (Surgical procedure performed by Surgical Bur). Exposure of the tooth was followed by the removal of overlying bone to expose the crown with the help of Chisel & Mallet in Group I and by Surgical Bur in Group II.

Statistical Analysis: At the end of the study following measures have been used to evaluate two different tooth removal techniques- Mean, Chi-square test, Standard Deviation, Paired "t" test, Confidence Limit

Results: Present study was done to evaluate the outcome of chisel and mallet against surgical bur method for removal of impacted third molar. Pain was more in group A than in group B. Mouth opening reduction was same in Group A and Group B. Swelling was prominent in group B than in group A. Infection was found to be more in individuals of group B than in group A. Anxiety level was found to be more in group A than in group B. However, the operating time was more in group A than in Group B.

Conclusions: In our opinion, bur technique would be the better option compared to the chisel and mallet technique taking into account the anxiety levels of patients. However chisel and mallet technique is also considered to be effective and feasible owing to the other factors such as post-operative pain, swelling, trismus.

Keywords: Impacted third molar, trismus, micro motor, pain, swelling

INTRODUCTION

Surgical elimination of impacted third molar is the commonest surgical measure performed in the department of oral and maxillofacial surgery set up. Surgical removal of impacted third molar is not an easy job for the reasons like its anatomical location and deprived ease of access. Third molar surgery may give rise to morbidities such as pain, trismus,

swelling inflammatory complications like alveolar osteitis (dry socket), and surgical site infections that may be severe enough to interfere with normal activities. Surgical complications may require additional management beyond what is originally planned.^[4] Although, various techniques have been practiced till date that is equally effective and competent in preventing the complications, this study is intended for clinically assessing and evaluating the two efficient techniques. The first technique uses the chisel and mallet while the second surgical technique uses the bur with micro motor. The techniques were compared on the following parameters- pain, swelling, infection, trismus and operation time.

MATERIALS AND METHODS

Forty patients with impacted third molars reported to the department of oral and maxillofacial surgery, Vivekananda dental college for women, tiruchengode. They were indicated for surgical extraction and were randomly selected from the outpatient department of oral and maxillofacial surgery. The patients were split into 2 groups- Group A with 20 patients and Group B with 20 patients. For the patients belonging to group A, the impacted tooth/teeth was removed by using the conventional chisel and mallet technique. And surgical bur technique was done for the second group- group B. Investigations like Orthopantomogram (OPG), intraoral periapical radiograph (IOPA) (OPG for WHARFE assessments and Pederson scale and IOPA for WAR lines), Hemoglobin, bleeding time, clotting time and blood glucose levels were made and assessed. Among the 40 patients, 22 patients had mesioangular type of impaction, 6 members had vertical type of impaction and 12 patients had distoangular type of impaction. Consent was obtained from the patients and the procedure was started.

TECHNIQUE

Patients were draped by way of using drape sheets under all aseptic settings. Patients were given local anesthesia until the desired level of anesthesia was attained. The blocks given were inferior alveolar nerve block and long buccal nerve block and lingual nerve block along with infiltrations. 2% lidocaine hydrochloride with 1:200,000 adrenaline was used. Standard wards incision was made on the site of surgery to expose the impacted third molar. Once done, the overlying bone has to be removed. For which two techniques were employed. First one is the chisel and mallet technique which was done for patients belonging to Group A. Distal to second molar; a perpendicular stop cut was made using 3 mm chisel with its beveled end opposite to the second molar. This is expected to avoid splitting of the bone down the buccal aspect of second molar. The stop cut was made depending on the depth of the impacted third molar. Following the establishment of the point where the elevator needs to be applied, the distal bone was detached to permit the liberation of the tooth. A 5 mm chisel was placed distal to the third molar with the beveled side upward and cutting edge parallel to the external oblique ridge for removal of this piece of bone. In these cases, lingual plate was not removed. However, the point of application of elevator was same as that of lingual split technique. For the patients belonging to Group B, Burs with micro motors were used. Straight fissure bur was mounted to a low speed micrometer. Straight hand piece was used to create a trough around the distal and buccal portion of the impacted tooth for a few cases. As the bone was removed in the distolingual region, lingual flap was correctly sheltered with a howartz elevator. Failing to do so probably causes damage to the lingual flap or the lingual nerve. All the way through the procedure, ample quantity of normal saline was used to irrigate to evade thermal necrosis of bone. The removal of tooth was done in toto for nearly all the cases. However, splitting of the tooth was also done in the course of removal for a few cases. Subsequent to the removal of impacted third molar, the wounds were inspected cautiously and checked for bone particles and tooth follicles. After removal of the granulation tissues, Sutures were placed by using 3-0 black silk. Same antibiotics and analgesics were given to all the 40 patients. The surgical time was noted from making the Incision till the last suture was placed.

DISCUSSION

An impacted tooth is one that does not erupt in the oral cavity and this may be due to any obstacle in its trail of eruption. Obstruction might be owing to neighboring tooth, bulky bone, and fibrous tissue. There are many techniques for surgical extraction of impacted mandibular third molars like buccal conventional technique using chisel and mallet or burs and lingual split technique^[1]. Countless tribulations allied with the elimination of mandibular third molar impaction have guided us to evaluate the prevailing techniques for their efficiency. This study was undertaken to judge clinically the efficacy of two different bone cutting techniques and approaches to eradicate investing bone in the removal of impacted mandibular third molar. In this study, 40 patients were included and randomly grouped in two groups as follows:

- a. Buccal approach technique using chisel and mallet,
- b. Buccal approach technique using rotary instruments.

Similar medications were given to all patients, and same regimen of antibiotics and analgesics were prescribed. Out of the forty patients selected, 27% were male and 73% were females. The distribution is clearly shown in table 1 and figure 1. 55% belonged to the age group of 15-25 and 45% belonged to the age group of 26-40. This is explained in table 2 and figure 2. Patients reported with three types of impactions- mesioangular(22), distoangular (12) and vertical(6) which is apparent from table-3 and figure-3.

Sides and methods of surgery were selected by coin tossing method. The parameters noted were—anxiety, operation time, pain, swelling, trismus and infection. The patients were examined on the 1st, 3rd and 5th day following the surgery. Pre-operative Anxiety of the patients was assessed with the help of Corah's Dental Anxiety Scale after explaining about the procedure to the patients. Intra Operative time taken was recorded for both the techniques. Post-operative Pain was assessed by the visual analog scale with the following Numerical scale,

- 0: No pain – The patient feels well
 1: Slight pain – If the patient is distracted, he does not feel pain
 2: Mild pain – The patient feels pain even if concentrating on some activity
 3: Moderate – The patient is very disturbed but nevertheless can continue with normal activities
 4: Severe pain – The patient is forced to abandon normal activities
 5: Extreme pain – The patient must abandon every type of activity and feels the need to lie down. Postoperative swelling was recorded by Breytenbach method of measurement, i.e., from tragus to pogonion (ear to chin) and from lateral canthus of eye to the angle of the mandible ^[13]. Trismus was measured by measuring interincisal distance both preoperatively and postoperatively. Post-operative Nerve injury was assessed by the presence of loss of sensation.

0	=	No sensational impairment
1	=	Mild loss of sensation
2	=	Moderate loss of sensation
3	=	Severe loss of sensation.

This study showed that the anxiety was found to be higher in patients belonging to Group A where chisel and mallet was used for the removal of impacted teeth. This is in accordance with the observational study conducted by amitkumar et al where he concluded that the anxiety of patients before the surgery was attributed to several factors like level of education, season and habitat, previous history of surgeries, substance abuse and age and that they were not modifiable.^[2]

Next parameter assessed was the operating time. Surgical time depends on a variety of factors like co-operation of the patients, instruments, skill of the surgeon, and surgical convenience from patients to patients.^[3] Almost all the patients were operated in between 30-60 minutes. Our study reveals that the surgical time was longer in group B when compared to group A. this is explained in Table 5 and figure 5. The grounds may be cutting with bur at low speed and suctioning the coolant. comparable studies were made by Rud and DrOdont in 1984^[8]Hindy, Singh et al. in 2013,^[9] and Vivek et al. in 2014,^[10] which also yielded the same results. Next to operating time, the factor assessed was pain. Patients were recalled on the 1st, 3rd and 5th day post-surgery and the other factors were evaluated. Pain was assessed by the visual analog scale and it was found that the patients belonging to group an experienced more pain when compared to the patients belonging to group B. People showed high levels of dissatisfaction and this may be owing to the probable fear and jerk caused by the mallet.^[11]Kruger^[5] and Thoma^[6] have mentioned pain to be post-operative complication in third molar surgery while using buccal approach.Kurger GO ^[5] used lingual split technique and Thoma^[6] and Archer^[7] have discussed about buccal bone cutting. They both have concluded that swelling was a recognized problem of third molar surgery. The incidence of swelling or infection causes contraction of muscle leading to trismus. Swelling was found to be more common in patients belonging to group B compared to group A. reason for more swelling in group C might be that electric-driven instruments generates a certain amount of onwads transmission force enough to drive the bone particles deeper to bony canaliculi; another reason may be inability to achieve complete sterilization of bur and hand piece assembly, which lead to cross-infection and brushing of surrounding tissues^[12]. Nevertheless, there was a noteworthy reduction in post-operative swelling at day 3 and day 5. Similar results were obtained by Singh et al. Invariably swelling can lead to trismus as mentioned earlier. In our study group, trismus was found to be more or less equal in both the groups. Next parameter considered was post-operative infection. Patients reported back with infections in few cases. However, group A patients were less infected in comparison with the group B patients.

Birn^[14]MacGrigor^[13] reported 5-10% occurrence of dry socket. Simpson stated that if bur or chisel were used appropriately, post-operative revival was roughly alike. Lilly^[15] and Horton^[16] showed that consequences were improved while using bur.

Szmyd et al^[12] evaluated the high speed bur technique verses the chisel mallet technique clinically and established no major difference in post-operative swelling, trismus, and pain and other symptoms, which is in controversy to our study.

Table-1: Gender wise distribution

Gender	Numbers	Percentage
Male	11	27.5%
Female	29	72.5%
Total	40	100%

Figure-1: Gender

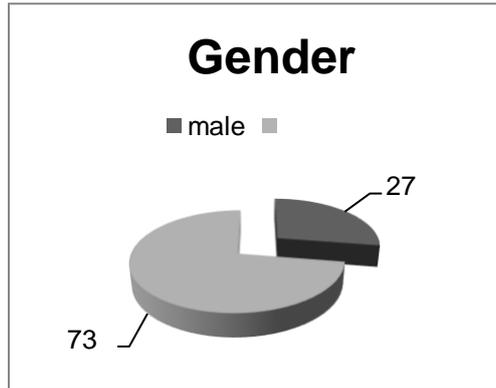


Table-2: Age wise distribution

Age group	Numbers	Percentage
15-25	22	55%
26-40	18	45%
Total	40	100%

Figure-2: Age

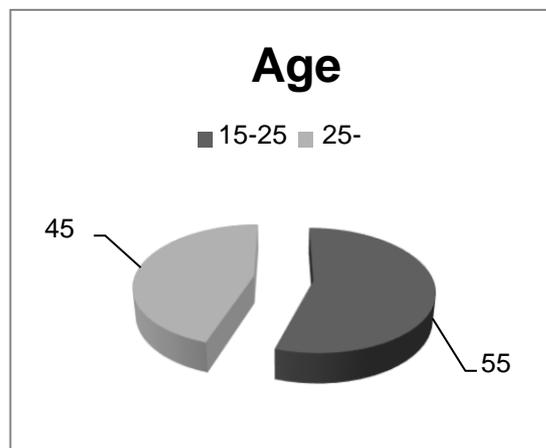
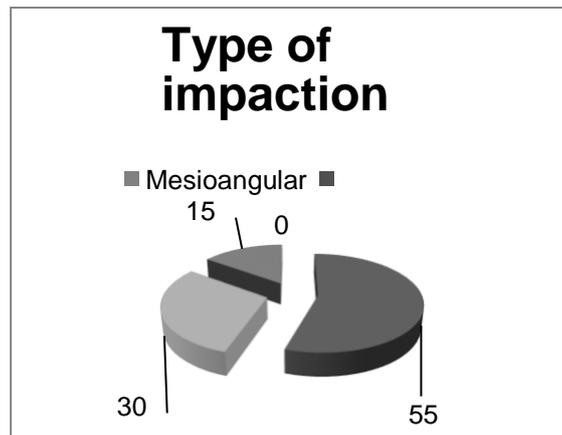


Table-3: Type of impaction

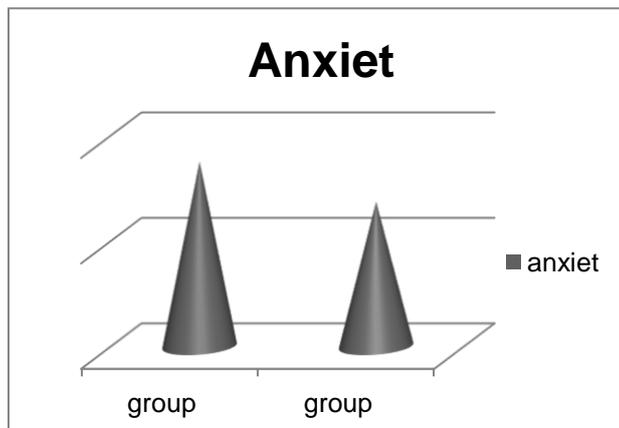
Type of impaction	Mesioangular	Distoangular	Vertical
Male	5	5	4
Female	17	7	2
Total	22	12	6
			Total- 40

Figure-3: Type of impaction



Pre- Operative analysis:

Figure-4: Anxiet



Intra-operative:

Figure-4: Operating Time

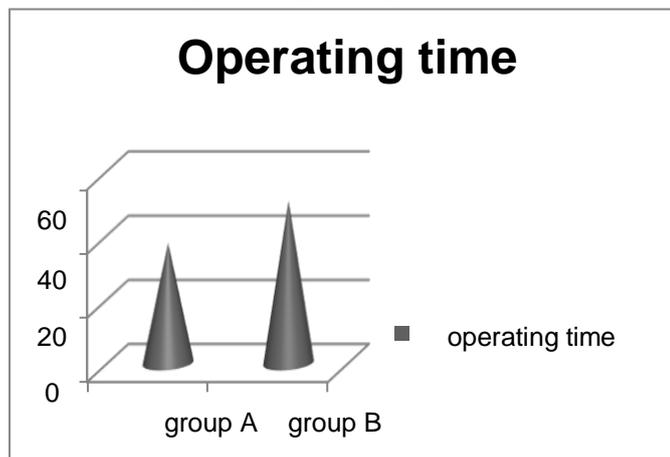


Table-4: Comparison of operating time in two groups

	GROUP A	GROUP B
MEAN	37.55	50.65
STANDARD DEVIATION	3.91	3.43

Post-operative analyses:

Figure-5: Trismus

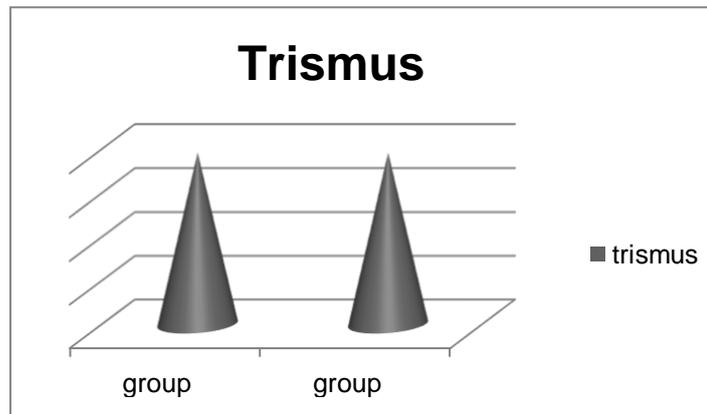


Figure-5: Pain

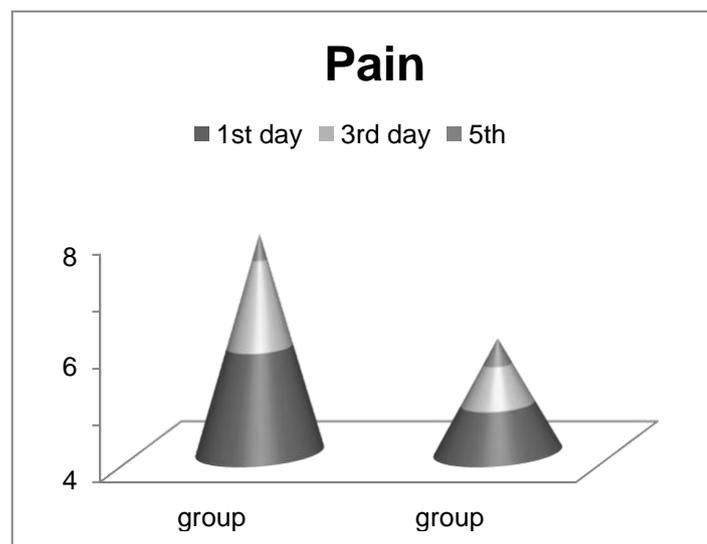


Table-5: comparison of pain between the two groups

		1st day	3rd day	5th day
Group A	Mean	3.72	3.04	0.9
	Standard deviation	0.98	0.99	0.81
Group B	Mean	1.7	1.4	0.9
	Standard deviation	1.12	1.18	0.71

Figure-6: Swelling

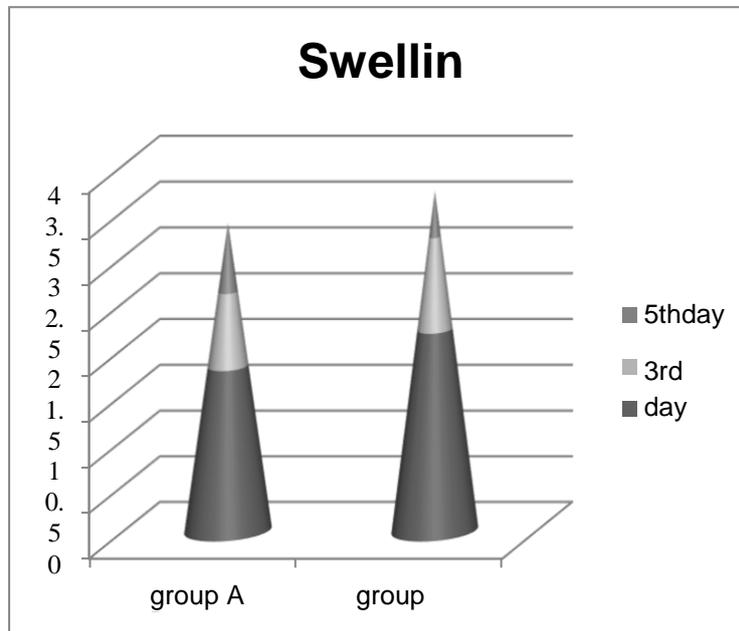


Table-6: comparison of swelling between the two groups

		1 st day	3 rd day	5 th day
Group A	Mean	1.8	0.81	0.75
	Standard deviation	0.69	0.54	0.91
Group B	Mean	2.20	1.01	0.5
	Standard deviation	1.26	0.69	0.38

CONCLUSION

In our opinion, bur technique would be the better option compared to the chisel and mallet technique taking into account the anxiety levels of patients. However chisel and mallet technique is also considered to be effective and feasible owing to the other factors such as post-operative pain, swelling, trismus. The only reason to avoid chisel and mallet technique was the anxiety, fear and jerk experienced by the patients. However, it could be considered with conscious sedation.

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