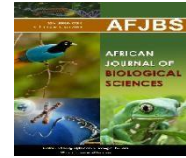


<https://doi.org/10.48047/AFJBS.6.8.2024.351-357>



African Journal of Biological Sciences



Research Paper

Open Access

IDENTIFICATION OF THE FATE OF MANDIBULAR THIRD MOLAR PRESENT ALONG THE FRACTURE LINE IN MANDIBULAR ANGLE FRACTURE: A RETROSPECTIVE ANALYSIS

Prof (Dr.) Sandeep Kumar Samal,^{1*} Dr Kumar Suraj Satapathy,² Dr Nitya Sundar Satpathy,³ Dr Suraj Papa Padhi,⁴ Dr Asutosh Pradhan,⁵ Dr Sachidananda Tripathy,⁶ Dr Tonmoy Ranu⁷

^{1*}Professor And HOD, Department of Oral and Maxillofacial Surgery, Hi Tech Dental College and Hospital, Pandara, Rasulgarh, Bhubaneswar, Odisha

²PGT Final Year MDS, Department of Oral and Maxillofacial Surgery, Hi Tech Dental College and Hospital, Pandara, Rasulgarh, Bhubaneswar, Odisha

³PGT Final Year MDS, Department of Oral and Maxillofacial Surgery, Hi Tech Dental College and Hospital, Pandara, Rasulgarh, Bhubaneswar, Odisha

⁴PGT Final Year MDS, Department of Oral and Maxillofacial Surgery, Hi Tech Dental College and Hospital, Pandara, Rasulgarh, Bhubaneswar, Odisha

⁵PGT Second Year MDS, Department of Oral and Maxillofacial Surgery, Hi Tech Dental College and Hospital, Pandara, Rasulgarh, Bhubaneswar, Odisha

⁶PGT Second Year MDS, Department of Oral and Maxillofacial Surgery, Hi Tech Dental College and Hospital, Pandara, Rasulgarh, Bhubaneswar, Odisha

⁷PGT Second Year MDS, Department of Oral and Maxillofacial Surgery, Hi Tech Dental College and Hospital, Pandara, Rasulgarh, Bhubaneswar, Odisha

Corresponding author

Dr Sandeep Kumar Samal,

Email id: drsandeepsamal@gmail.com

Article History

Volume 6, Issue 8, 2024

Received: 11 Mar 2024

Accepted: 14 Apr 2024

doi: 10.33472/AFJBS.6.8.2024.351-357

ABSTRACT

Background: Controversial data in the literature exist whether to extract or preserve the teeth in fracture line where few studies favor preservation of the non-infected tooth in fracture line owing to its advantages, whereas, other data suggest its removal which managing fracture.

Aim: The present retrospective clinical study was conducted to assess and identify the fate of mandibular third molar present along the fracture line in mandibular angle fracture.

Methods: The present retrospective study included 86 cases with mandibular angle fracture which were further divided into two groups. In group I cases, the third molar was retained while managing the fracture, whereas, for group II, third molars were extracted while managing the fracture. The indications considered for extraction were periapical lesions, mobility, periodontal discharge, redness, and associated pain. Considering the bone healing following extraction in these cases, extraction was done.

Result: 3rd mandibular molar was extracted in 36.04% (n=31) study subjects. In 63.95% (n=55) study subjects the mandibular 3rd molar in the fracture line was retained and not extracted. vertical impaction was seen in 37.5% (n=18) subjects with partial 3rd molar impaction, mesioangular impaction was also seen in 50% (n=24) study subjects with partial 3rd molar impaction. There was a total of 48 cases with partial 3rd molar impaction. In complete 3rd molar impaction, for all 38 cases, the impaction type was not applicable. In total of 86 cases, vertical, mesioangular, disto-angular, and non-applicable impaction type was seen in 20.93% (n=18), 27.90% (n=24), 6.97% (n=6), and 44.18% (n=38) study subjects respectively. In the 3rd molar removed group, implants were retrieved in 25.80% (n=8) subjects and were retained in 74.19% (n=23) subjects. In the 55 subjects where the 3rd molar was retained, implants were retrieved in 10.90% (n=6) study subjects and were retained in 89.09% (n=49) study subjects. Implants were retrieved in a total of 16.27% (n=14) study subjects, whereas, implants were retained in 83.72% (n=72) study subjects.

Conclusion: The present study concludes that to get better outcomes following management of the mandibular angle fracture, partially impacted third molars should be extracted during the treatment itself provided the stability of the fracture segments is maintained.

Keywords: Mandibular angle fracture, mandibular fracture, Third molar, Tooth in line of fracture.

INTRODUCTION

The mandibular region of the face is the most commonly fractured area during a blow or road traffic accident posing impacts in this area. This area is more prominent to fracture owing to its skeletal position and prominence which predispose it to trauma frequently. Encountering third

molars and other teeth in the mandibular fracture lines is a common finding. However, controversial data in the literature exist whether to extract or preserve the teeth in fracture line where few studies favor the preservation of the non-infected tooth in fracture line owing to its advantages, whereas, other data suggest its removal which managing fracture. Previous literature data suggest that teeth in fracture lines can help in determining the fracture location adequately. In the recent past, management strategies for teeth in fracture lines have changed were in the past, it was suggested to remove teeth in the fracture line immediately.¹

Recent literature data also favors the retention of non-infected teeth present in the fracture line as preserving these teeth can help in treatment in a few cases, and hence, these can contribute to the fracture stability in some cases. Removing or extracting teeth present in the fracture line can be harmful in a few cases including the bony loss in tension zone, conversion of a closed fracture into an open one, increase contamination risk in fracture via empty alveolus, increase trauma to already affected region, and diminishing the contact between the fracture segments.²

A tooth is considered retained when following the normal eruption, it is covered with either soft tissue and/or bone. A tooth can be retained owing to the presence of cysts and/or tumors, supernumerary teeth, impacted hard and/or soft tissue, retention of deciduous tooth trauma, less space for tooth eruption, improper tooth positioning for adjacent teeth or dental germ, dental anomalies, and/or early deciduous teeth loss. Few literature studies reported that the most commonly impacted tooth is the mandibular third molar followed by maxillary third molars, maxillary canines, and supernumerary teeth.³

Third molars that are retained can be classified based on the long axis to the third molar angle in comparison with the adjacent second molar where the most commonly seen position is vertically followed by mesioangular or mesial position. However, this data is conflicting where mesioangular was found to be the most common position followed by the vertical position.⁴ The present retrospective clinical study was conducted to assess and identify the fate of mandibular third molar present along the fracture line in mandibular angle fracture.

MATERIALS AND METHODS

The present retrospective clinical study was conducted to assess and identify the fate of mandibular third molar present along the fracture line in mandibular angle fracture. The present study was conducted at Department of Oral and Maxillofacial Surgery, Hi Tech Dental College and Hospital, Pandara, Rasulgarh, Bhubaneswar, Odisha. The study population was comprised of the subjects visiting the Department of Oral and Maxillofacial Surgery of the Institute.

The inclusion criteria for the study were subjects of age 18-55 years, with complete medical records and data, subjects with mandibular angle fracture, and subjects requiring open reduction and internal fixation. The exclusion criteria for the study were subjects having infected fracture sites, subjects with incomplete records and less than 6 months follow-up, subjects managed with closed reduction or by intermaxillary fixation, pregnant and lactating females, and subjects having pre-existing systemic diseases.

After the final inclusion of the study subjects based on the inclusion criteria, the fracture site was accessed with the intraoral vestibular incision. This was followed by the anatomic reduction and plating after approximation of the fracture segments. The teeth present in the fracture line was extracted if it does not compromise the bone fragment reduction, involved or

exposed apical half or more of the root, tooth mobility, caries, periodontal/pericoronal infection, and fractured teeth.

Postoperative infection for the study was considered for the purulent discharge needing surgical intervention including plate removal. For fracture reduction, in all the study subjects, plates and screws were used with semi-rigid fixation. Following treatment, antibiotic coverage and analgesics were given to all the subjects for 3 days. The present retrospective study included 86 cases with mandibular angle fracture which were further divided into two groups. In group, I cases, the third molar was retained while managing the fracture, whereas, for group II, third molars were extracted while managing the fracture. The indications considered for extraction were periapical lesions, mobility, periodontal discharge, redness, and associated pain. Considering the bone healing following extraction in these cases, extraction was done.

At the 3rd month follow-up, a few additional teeth were extracted which were retained initially owing to the presence of infection. At the follow-up of the 6th month, implant plates were removed and teeth were extracted for the group where they were initially retained.

The collected data were subjected to the statistical evaluation using SPSS software version 21 (Chicago, IL, USA) and one-way ANOVA and t-test for results formulation. The data were expressed in percentage and number, and mean and standard deviation. The level of significance was kept at $p < 0.05$.

Results

The present retrospective clinical study was conducted to assess and identify the fate of mandibular third molar present along the fracture line in mandibular angle fracture. The present retrospective study included 86 cases with mandibular angle fracture which were further divided into two groups. In group, I cases, the third molar was retained while managing the fracture, whereas, for group II, third molars were extracted while managing the fracture. The demographic characteristics of the study subjects are listed in Table 1. The mean age of the study subjects was 34.62 ± 4.28 years. There were 9.30% (n=8) subjects in the age range of <20 years. The majority of the study subjects were in the age range of 21-40 years with 74.41% (n=64) subjects followed by 16.27% (n=14) subjects in the age range of 41-55 years. There were 84.8% (n=73) males and 15.11% (n=13) females in the present study. The etiology of mandibular angle fracture was RTA (road traffic accidents) in 83.72% (n=72) subjects, blow in 11.62% (n=10) subjects, and others in 4.65% (n=4) study subjects (Table 1).

On assessing the extraction or removal of mandibular 3rd molar present in the fracture line in the study subjects, it was seen that the 3rd mandibular molar was extracted in 36.04% (n=31) study subjects. In 63.95% (n=55) study subjects the mandibular 3rd molar in the fracture line was retained and not extracted as shown in Table 2.

The study results showed that vertical impaction was seen in 37.5% (n=18) subjects with partial 3rd molar impaction, mesioangular impaction was also seen in 50% (n=24) study subjects with partial 3rd molar impaction. There were a total of 48 cases with partial 3rd molar impaction. In complete 3rd molar impaction, for all 38 cases, the impaction type was not applicable. In total of 86 cases, vertical, mesioangular, disto-angular, and non-applicable impaction type was seen in 20.93% (n=18), 27.90% (n=24), 6.97% (n=6), and 44.18% (n=38) study subjects respectively as shown in Table 3.

In the 3rd molar removed group, implants were retrieved in 25.80% (n=8) subjects and were retained in 74.19% (n=23) subjects. In the 55 subjects where the 3rd molar was retained, implants were retrieved in 10.90% (n=6) study subjects and were retained in 89.09% (n=49) study subjects. Implants were retrieved in a total of 16.27% (n=14) study subjects, whereas, implants were retained in 83.72% (n=72) study subjects as depicted in Table 4.

DISCUSSION

The present retrospective clinical study was conducted to assess and identify the fate of mandibular third molar present along the fracture line in mandibular angle fracture. The mean age of the study subjects was 34.62±4.28 years. There were 9.30% (n=8) subjects in the age range of <20 years. The majority of the study subjects were in the age range of 21-40 years with 74.41% (n=64) subjects followed by 16.27% (n=14) subjects in the age range of 41-55 years. There were 84.8% (n=73) males and 15.11% (n=13) females in the present study. The etiology of mandibular angle fracture was RTA (road traffic accidents) in 83.72% (n=72) subjects, blow in 11.62% (n=10) subjects, and others in 4.65% (n=4) study subjects. On assessing the extraction or removal of mandibular 3rd molar present in the fracture line in the study subjects, it was seen that the 3rd mandibular molar was extracted in 36.04% (n=31) study subjects. In 63.95% (n=55) study subjects the mandibular 3rd molar in the fracture line was retained and not extracted. These findings were consistent with the results of Inaoka SD et al⁵ in 2009 and Marciani RD⁶ in 2007 where authors showed similar proportions of retained and extracted third molars in the fracture line.

The study results also showed that vertical impaction was seen in 37.5% (n=18) subjects with partial 3rd molar impaction, mesioangular impaction was also seen in 50% (n=24) study subjects with partial 3rd molar impaction. There was a total of 48 cases with partial 3rd molar impaction. In complete 3rd molar impaction, for all 38 cases, the impaction type was not applicable. In total of 86 cases, vertical, mesioangular, disto-angular, and non-applicable impaction type was seen in 20.93% (n=18), 27.90% (n=24), 6.97% (n=6), and 44.18% (n=38) study subjects respectively. These results were in agreement with the studies of Balaji P⁷ in 2015 and Lim HY et al⁸ in 2017 where comparable impaction types as the present study were shown by the authors in their studies.

In 3rd molar extracted group, implants were retrieved in 25.80% (n=8) subjects and was retained in 74.19% (n=23) subjects. In the 55 subjects where the 3rd molar was retained, implants were retrieved in 10.90% (n=6) study subjects and were retained in 89.09% (n=49) study subjects. Implants were retrieved in a total of 16.27% (n=14) study subjects, whereas, implants were retained in 83.72% (n=72) study subjects. These findings were similar to the studies of Subbaiah MK et al⁹ in 2015 and Bobrowski AN et al¹⁰ in 2013 where authors reported similar rates of implant removal and retention as in the present study.

CONCLUSION

Within its limitations, the present study concludes that to get better outcomes following management of the mandibular angle fracture, partially impacted third molars should be extracted during the treatment itself provided the stability of the fracture segments is maintained. Also, third molar retention has more risk of post-operative infection which is not significant statistically. The present study had a few limitations including small sample size, shorter monitoring period, and geographical area biases. Hence, more longitudinal studies with larger sample size and longer monitoring period will help reach a definitive conclusion.

REFERENCES

1. Al-Khateeb TH, Bataineh AB. Pathology associated with impacted mandibular third molars in a group of Jordanians. *J Oral Maxillofac Surg* 2006;64:1598–602.
2. Damante JH, Freitas JAS, Tavano O, Alvares LC. Interpretação radiográfica. In: Alvares LC, Tavano O, eds. *Curso de Radiologia em Odontologia*. São Paulo: Editora Santos; 2009:129–218.
3. Sakr K, Farag IA, Zeitoun IM. Review of 509 mandibular fractures treated at the University Hospital, Alexandria, Egypt. *Br J Oral Maxillofac Surg*. 2006;44:107-11.
4. Farish SE, Bouloux GF. General technique of third molar removal. *Oral Maxillofac Surg Clin North Am* 2007;19:23–43.
5. Inaoka SD, Carneiro SCAS, Vasconcelos BCE, Leal J, Porto GG. Relationship between mandibular fracture and impacted lower third molar. *Med Oral Patol Oral Cir Bucal* 2009;14:349–54.
6. Marciani RD. Third molar removal: an overview of indications, imaging, evaluation, and assessment of risk. *Oral Maxillofac Surg Clin North Am* 2007;19:1–13.
7. Balaji P, Balaji SM. Fate of third molar in line of mandibular angle fracture - Retrospective study. *Indian J Dent Res*. 2015;26:262-6.
8. Lim HY, Jung TY, Park SJ. Evaluation of postoperative complications according to treatment of third molars in mandibular angle fracture. *J Korean Assoc Oral Maxillofac Surg*. 2017;43:37-41.
9. Subbaiah MK, Ponnuswamy I, David M. Relationship between mandibular angle fracture and state of eruption of mandibular third molar: A digital radiographic study. *J Indian Acad Oral Med Radiol*. 2015;27:35.
10. Bobrowski AN, Sonogo CL, Chagas OL. Postoperative infection associated with mandibular angle fracture treatment in the presence of teeth on the fracture line: A systematic review and meta-analysis. *Int J Oral Maxillofac Surg*. 2013;42:1041-8.

TABLES

S. No	Characteristics	Percentage (%)	Number (n=86)
1.	Mean age (years)	34.62±4.28	
2.	Age range (years)		
a)	<20	9.30	8
b)	21-40	74.41	64
c)	41-55	16.27	14
3.	Gender		
a)	Males	84.88	73
b)	Females	15.11	13
4.	Fracture etiology		
a)	RTA (road traffic accidents)	83.72	72
b)	Blow	11.62	10
c)	Others	4.65	4

Table 1: Demographic characteristics of the study subjects

S. No	Extraction/ retaining of mandibular 3 rd molar	Percentage (%)	Number (n=86)
1.	Extracted	36.04	31
2.	Retained	63.95	55

3.	Total	100	86
----	-------	-----	----

Table 2: Retention or removal of the third molar in the fracture line in the study subjects

S. No	Impaction type	Complete 3 rd molar impaction		Partial 3 rd molar impaction		Total	
		%	n=38	%	n=48	%	n=86
1.	Vertical	0	0	37.5	18	20.93	18
2.	Mesio-angular	0	0	50	24	27.90	24
3.	Disto-angular	0	0	12.5	6	6.97	6
4.	Not applicable	100	38	0	0	44.18	38
5.	Total	100	38	100	48	100	86

Table 3: Impaction type of 3rd molars in the study cases

S. No	Implant retrieved	3 rd molar removed		3 rd molar retained		Total	
		%	n=31	%	n=55	%	n=86
1.	Retrieved	25.80	8	10.90	6	16.27	14
2.	Retained	74.19	23	89.09	49	83.72	72
3.	Total	100	31	100	49	100	86

Table 4: Implant removal and third molar retention in the study subjects