

Original Article

PRESENCE OR ABSENCE OF TOOTH IN THE LINE OF ANGLE FRACTURE- DIFFERENCE IN THE COMPLICATION RATE

Amiya Agrawal¹, Siddhartha Chandel², Gaurav Singh³, Nishi Singh⁴, Parul Singh⁵, Ankita Singhal⁶

¹Assistant Professor, Department of Trauma & Emergency (Oral & Maxillofacial Surgery), King George's Medical University, Lucknow, Uttar Pradesh, ²Associate Professor, Department of Dentistry, Era University, Lucknow, Uttar Pradesh, ³Reader, Department of Oral and Maxillofacial Surgery, Shree BankeyBihari Dental College, Ghaziabad, Uttar Pradesh, ⁴Reader, Department of Periodontics, Career Dental College and Hospital, Lucknow, Uttar Pradesh, ⁵SeniorPedodontic Consultant & Director DOC Clinics and Research Center Pvt. Ltd. Delhi. ⁶Orodonal Surgeon, The Dentist Dental Clinic, Daliganj, Lucknow, India

Abstract

Background: Mandibular fractures are the most commonly occurring facial fractures and angle is the most common site for postoperative complications. Many reasons are thought to be responsible for this like non self cleansing area, poor access to oral hygiene, junction of dentulous and edentulous regions of jaws, presence of tooth in the fracture line. It has always been a topic of debate or controversy regarding the prophylactic removal of wisdom tooth in the fracture line before the fixation of fracture. The aim of present study is to evaluate the prognosis and complications associated with mandibular angle fracture, in which tooth is present or absent in the fracture line. The study also gives an idea about the aetiology of mandibular fractures. **Materials and Methods:** The retrospective study was conducted wherein all 134 patients treated with angle fracture were analysed. Patients were divided into two categories- in Group I, third molar was present in the line of angle fracture and in Group II, and there was no tooth in the line of fracture. Data was taken from the medical records present in the hospital. Information regarding patient's age, sex, side of angle fracture, etiology of fracture, medical history, time interval between trauma and surgery was recorded. Any complications occurring during the follow up period were divided into minor and major. Initial follow up interval was once every two weeks for a period of four months. After that the patient was followed monthly for the rest of the year. **Results :** A total of 134 patients with angle fracture took part in the study. There were 86.4% male patients (n=116) and 13.4% female patients (n=18). Out of these majority of them i.e. 41.7% belonged to an age group of 20-30 years. Majority of patients i.e. 54.4% met with a road traffic accident. Approximately 32.1% patients (n= 43) were of assaults. In group I, 10 patients presented with major and minor complications. There were 5 patients who had major and 5 patients had minor complications. In group II, 7 patients had complications- 3 major and 4 minor complications. The difference was statistically not significant. **Conclusion:** According to our study results, presence or absence of third molars had no influence in the healing of angle fractures of mandible.

Keywords: Angle, Complications, Fracture, Mandible

Corresponding author: Dr. Gaurav Singh, Reader, Department of Oral and Maxillofacial Surgery, Shree Bankey Bihari Dental College, Ghaziabad, Uttar Pradesh

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INTRODUCTION

Facial fractures are very common fractures these days accounting for 23%- 27% of bony injuries.¹ Amongst facial bones, mandible is the most commonly affected bone. Mandibular angle is the common site of fracture and is the most common site of postoperative infection.² Many reasons are thought to be responsible for this like non self cleansing area, poor access to oral hygiene, junction of dentulous and edentulous regions of jaws, presence of tooth in the fracture line.^{3,4} It has always been a topic of debate or controversy regarding the prophylactic removal of wisdom tooth in the fracture line before the fixation of fracture.⁵ According to Bradley et al⁶ in 1965, prophylactic tooth extraction leads to a decrease in incidence of infection or non-union. However according to recent recommendations extraction is only advised under specific causes following administration of antibiotics. According to a recent set of studies conducted by Zacharides et al⁷ and Malanchuk et al⁸ in 2007, postoperative infectious complications are attributed to limited use of antimicrobial agents, delayed medical care and the use of semi rigid method of fixation. The decision regarding the treatment still depends on the case and varies with each case and is also dependent on surgeon's experience and preference. The aim of present study is to evaluate the prognosis and complications associated with mandibular angle fracture, in which tooth is present or absent in the fracture line. The study also gives an idea about the aetiology of mandibular fractures.

MATERIALS AND METHODS

The retrospective study was conducted in the respective department during a period of February, 2013- December, 2016. In this study all the patients treated with angle fracture were analysed. Patients were divided into two categories- in Group I, third molar was present in the line of angle fracture and in Group II, and there was no tooth in the line of fracture. Teeth with periodontitis, caries were only removed and rest of the teeth associated with angle fracture were retained. There was no prophylactic extraction of third molars in our study. Patients who were not available for follow up data or patient's whose data was missing were not included in the study. Patients were recalled for a follow up period of two years. Initial follow up interval was once every two weeks for a period of four months. After that the patient was followed monthly for the rest

of the year. All the patients were treated with open reduction and internal fixation with a 4 or 6 hole 2mm miniplate placed according to Champy's line of osteosynthesis i.e. along the external oblique ridge. Intraoral vestibular degloving incision was given in all the patients. Postoperative IMF was done for a period of 2 weeks followed by elastics for 1 week. Patients were maintained on liquid diet and antibiotic was given to all the patients postoperatively. Data was taken from the medical records present in the hospital. Information regarding patient's age, sex, side of angle fracture, etiology of fracture, medical history, time interval between trauma and surgery was recorded. Any complications occurring during the follow up period were divided into minor and major. Major complications included malunion, non union, infection, loosening of plate or screw, resorption of tooth and periapical pathology. Amongst minor complications were mild infections, plate exposure, and wound dehiscence. Data was arranged in a tabulated form and chi square test and Fischer test was used for analysis of difference. SPSS software was used for analysis. The result was considered significant if p value was less than or equal to 0.05.

RESULTS

A total of 134 patients with angle fracture took part in the study. There were 86.4% male patients (n=116) and 13.4% female patients (n=18). Out of these majority of them i.e. 41.7% belonged to an age group of 20-30 years. The second highest group was 30-40 years with 29.1% of total patients. Least number of patients were there between 10-20 years of age (5.2%) and more than 60 years of age (5.9%). Approximately 7.4% of patients belonged to 50-60 years of age. Majority of patients i.e. 54.4% met with a road traffic accident. Approximately 32.1% patients (n= 43) were of assaults. There were only 6.7% patients (n=9) who had a fall from height and 2.9% patients (n=4) of sports injuries. The mean interval between trauma and surgery was 4.2 days. (Table 1) Group 1 patients included 89 patients of angle fracture. There were 5 patients who had bilateral angle fracture and tooth was involved in the fracture line. Caries and periodontitis were not associated with any third molar and hence they were retained in all the cases. It included patients between the ages of 17-65 years of age with the mean of 30.2+/- 4.8 years. Plate removal was not carried out in any group. In group I, 10 patients presented with major

Table 1 : information obtained from case records and during the follow up period.

	Group 1(n=89) (66.4%)	Group 2 (n=47) (33.5%)	Total (n=134)	P value
Sex				>0.05
Male	76(65.5%)	40(34.5%)	116(86.4%)	
Female	13(72.2%)	5(27.7%)	18(13.4%)	
Age Group				>0.05
10-20	4(57.1%)	3(42.8%)	7(5.2%)	
20-30	40(71.4%)	16(28.5%)	56(41.7%)	
30-40	28(71.7%)	11(28.2%)	39(29.1%)	
40-50	6(42.8%)	8(57.1%)	14(10.4%)	
50-60	7(70%)	3(30%)	10(7.4%)	
60+	4(50%)	4(50%)	8(5.9%)	
Etiology				>0.05
Road traffic accidents	48(65.7%)	25(34.2%)	73(54.4%)	
Assaults	31(72.1%)	12(27.9%)	43(32.1%)	
Sports injuries	2(50%)	2(50%)	4(2.9%)	
Home accidents	4(80%)	1(20%)	5(3.7%)	
Fall from height	6(66.6%)	3(33.3%)	9(6.7%)	
Complications				>0.05
None	79(67.5%)	38(32.4%)	117(87.3%)	
Major	5(62.5%)	3(37.5%)	8(5.9%)	
Minor	5(55.5%)	4(44.4%)	9(6.7%)	

and minor complications. There were 5 patients who had major and 5 patients had minor complications. Two patients did not follow the postoperative instructions and hence had malocclusion after 2.5 months which was corrected by elastics. One patient had grade II mobility which was treated by extraction. Two patients had infection in which incision and drainage followed by antibiotic treatment was done. Amongst minor

complications 3 patients had wound dehiscence and two had plate exposure. All of them were treated conservatively. Group II included 47 patients (33.5%) , out of them 40 were males (34.5%) and 5 were females (27.7%). Patients were aged between 19-75 years of age with the mean age of 34.41+/- 5.6 years. In this group 7 patients had complications- 3 major and 4 minor complications. Two patients didn't report during

the follow up period and hence presented with malocclusion. One patient had infection at the fracture site which was treated by incision and drainage and postoperative antibiotics. Amongst minor complications, all patients had limited wound dehiscence which was treated conservatively. On applying fisher test it was seen that there was no significant difference in the gender of the patients and complication rates amongst both the groups. Chi square test was applied to check the significance between age group and etiology, but no significant difference was observed.

DISCUSSION

The incidence of mandibular angle fractures range from 23-42% of total mandibular fractures.⁹ According to Ellis, angle fractures are most commonly associated with complications. The etiologic factors responsible for complications are poor nutritional status, poor oral hygiene, and delay in seeking medical care, non compliant patient, teeth in the fracture line. Other factors that may influence complications are fracture favourability, bone thickness and quality and biting forces. It has always been a source of controversy regarding the removal of third molar present in the fracture line. According to some authors, presence of third molars impairs reduction, alters the vascularity and is a source of infection. So they should be removed before reduction.¹⁰ According to some other authors like Kahnbery and Ridell et al¹¹, teeth left along the fracture line lead to a satisfactory healing. According to our study conducted in 134 patients, there was no significant difference in the complication rate between the two groups. Healing was satisfactory in both the groups. According to authors like Rai and Prahari¹², Chrcanovic et al¹³, retaining third molars in the fracture line is beneficial as it allows for more accurate approximation with larger surface area for reduction. In today's era it has been seen that there has been a significant reduction in the rate of infection and decrease in other complications because of the use of miniplates combined with antibiotics. In the earlier studies conducted by Burch et al¹⁴ and Bradley et al⁶, importance was given to prophylactic removal of third molars but it has become obsolete these days. Furthermore, the rate of complications is also influenced by the method of fixation that is opted. Complication of 7-17% was reported with closed reduction or non rigid methods of fixation.^{15,16} In our present study the rate of complications was

higher in Group I (presence of teeth in the fracture line), this was in accordance with the study conducted by Ramkrishnan et al¹⁷ in 2009, de Amaratunga et al¹⁸ in 1987. According to author Chrcanovic¹³, tooth present in the fracture line should be extracted in following cases where the tooth is associated with any pathologic changes like periodontitis, caries, crown root fracture or tooth interfering with reduction.

CONCLUSION

Third molar retention is associated with complications but the difference was not significant according to our study. Administration of postoperative antibiotics and IMF with light traction using elastics for a period of greater than 2 weeks can significantly lower the incidence of complications.

REFERENCES

1. Natu SS, Pradhan H, Gupta H, Alam S, Gupta S, Pradhan R, et al: An epidemiological study on pattern and incidence of mandibular fractures. *Plast Surg Int* 2012, 2012 834364
2. Ellis E. Treatment methods for fractures of the mandibular angle. *Int J Oral Maxillofac Surg* 1999;28:243-53.
3. Yadav S, Tyagi S, Puri N, Kumar P, Kumar P. Qualitative and quantitative assessment of relationship between mandibular third molar and angle fracture on North Indian population: A clinico- radiographic study. *Eur J Dent* 2013;7:212- 7.
4. Ellis E 3rd. Outcomes of patients with teeth in the line of mandibular angle fractures treated with stable internal fixation. *J Oral Maxillofac Surg* 2002;60:863- 5.
5. Kamboozia AH, Punnia-Moorthy A. The fate of teeth in mandibular fracture lines. A clinical and radiographic follow-up study. *Int J Oral Maxillofac Surg* 1993;22:97.
6. Bradley RL: Treatment of fractured mandible. *Am Surg* 31: 289e290, 1965
7. Zachariades N, Papademetriou I: Complications of treatment of mandibular fractures with compression plates. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 79(2): 150e153, 1995
8. Malanchuk VO, Kopchak AV: Risk factors for development of infection in patients with mandibular fractures located in the

- tooth-bearing area. J Craniomaxillofac Surg 35(1): 57e62, 2007
9. Safdar N, Meechan JG. Relationship between fractures of the mandibular angle and the presence and state of eruption of the lower third molar. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1995;79:680–4.
 10. Assael LA. Treatment of mandibular angle fractures: plate and screw fixation. J Oral Maxillofac Surg 1994;52:757–61.
 11. Kahnberg KE, Ridell A. Prognosis of teeth involved in the line of mandibular fractures. Int J Oral Surg 1979;8:163- 72.
 12. Rai S, Pradhan R: Tooth in the line of fracture: its prognosis and its effects on healing. Indian J Dent Res 22(3): 495e496, 2011
 13. Chrcanovic BR: Teeth in the line of mandibular fractures. Oral Maxillofac Surg 27,2012a
 14. Burch RJ: Treatment of displaced fractures of the edentulous mandibular angle. Oral Surg Oral Med Oral Pathol 4(9): 1101e1107, 1951 Sep
 15. Passeri L, Ellis E, Sinn D. Complications of nonrigid fixation of mandibular angle fractures. J Oral Maxillofac Surg 1993;51:382–4.
 16. James RB, Fredrickson C, Kent JN. Prospective study of mandibular fractures. J Oral Surg 1981;39:275–81.
 17. Ramakrishnan J, Shingleton A, Reeves D, Key JM, Vural E: The effects of molar tooth involvement in mandibular angle fractures treated with rigid fixation. Otolaryngol Head Neck Surg 140(6): 845e848, 2009
 18. de Amaratunga NA: The effect of teeth in the line of mandibular fractures on healing. J Oral Maxillofac Surg 45(4): 312e314, 1987

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