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CONCOMITANT FRACTURES OF MANDIBULAR ANGLE AND CONTRALATERAL PARASYMPHYSIS: A RETROSPECTIVE CASE SERIES FROM A RURAL HOSPITAL

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ABSTRACT

Aim of Study: To evaluate the results of open reduction and internal fixation (ORIF) for treatment of concomitant fracture of mandibular angle and contralateral parasymphysis in a rural background setup with limited facilities. Materials and Methods: The study involved a retrospective analysis of cases operated at a Civil Hospital in rural background setup by a single surgeon (the author himself). Results: A total of 5 cases satisfied the inclusion and exclusion criteria. On postoperative examination, none of the patients showed malunion at fracture site. No patient demonstrated gap at superior border of the mandible. None of the patients showed malocclusion. Conclusion: A peculiar set of mandibular fractures treated in a setup of rural background with limited facilities achieved adequate union at fracture site without any complications.

KEYWORDS: Concomitant fractures mandibular angle mandibular parasymphysis, mandibular fractures, mandibular angle fractures, mandibular parasymphysis fractures, case series, impacted mandibular third molar.

INTRODUCTION

Mandibular fractures comprise the majority of all maxillofacial fractures, the incidence being reported as high as 76% of all facial fractures,[1,2,3] by many studies. This is due to the exposed position of the mandible in the architecture of human face, with the protuberance of chin being a vulnerable point for trauma. Zhou et al,[4] reported the incidence of fracture at different sites of the mandible as 56.5% for mandibular condyles, 45% for mandibular symphysis, 25.5% for mandibular body and 16.5% for mandibular angle.

It is well known that fractures of the mandibular angle occur concomitantly with fracture of contralateral parasymphysis, the incidence being reported as 21% in one Indian study.[5] This is due to direction of transmission of force and existence of vulnerable weaknesses at the angle of mandible.[6] The presence of an impacted tooth at the angle of mandible makes this area highly prone to fracture, when subjected to trauma. This has been confirmed by multiple studies.[1,2,3] In a study by Tevepaugh et al,[3] it was concluded that presence of impacted mandibular third molar at angle of mandible increases the risk of fracture by 3.8 times higher as compared to absence of impacted molars. Fuselier et al showed that mesioangular impaction was more common in patients with fracture of angle.[7]

AIM OF STUDY

To evaluate the results of open reduction and internal fixation (ORIF) for treatment of concomitant fracture of mandibular angle and contralateral parasymphysis in a rural background setup with limited facilities.

MATERIALS AND METHODS

The study involved a retrospective analysis of cases operated at a Civil Hospital in rural background setup by a single surgeon (the author himself). In the period of five years ranging from 2011 to 2015, the author was working at a Government Civil Hospital in Punjab state of India as a Maxillofacial Surgeon. The radiographs and case histories of all trauma patients operated upon by the author were systematically preserved by the author for academic purpose. The hospital being situated in a rural area, during the initial three years period out of this five year tenure, no facility of orthopantomogram (OPG) was available for radiologic examination of patients. During this initial three year period, radiologic examination was done with PA view mandible (Figure 1) and lateral oblique view radiographs. Also the patients could not afford CT scans or MRI scans. Postoperative radiographs were obtained at 1, 2, 4 and 8 weeks after surgery. In the later two years (i.e. 2014 and 2015), postoperative evaluation was done with OPG (Figure 2). In view of the financial constraints, stainless steel miniplates and screws were used in ORIF, instead of titanium plates.

The plates and screws had been manufactured by an Indian company. The 2.5 mm miniplate osteosynthesis system was used in all the mandibular fractures.

Inclusion criteria

Concomitant fracture of mandibular angle and contralateral parasymphysis with presence of impacted mandibular third molar at site of fractured angle of mandible.

Exclusion criteria

1. Cases with presence of other coexisting maxillofacial fractures such as fracture of maxilla or zygomatic bone.
2. Cases where primary care of patient was done at some other hospital.
3. Cases with comorbidities of diabetes mellitus or cardiac ailments, were excluded.

A detailed analysis of mandibular fracture cases was done, in patients operated from the year 2011 to year 2015 at a Civil Hospital by the author himself. Data was collected in relation to gender, age, site of fracture, presence of impacted third molar at site of fracture in angle of mandible, whether fracture line was favourable or unfavourable, whether IMF was achieved with Ehrich arch bars or Eyelet wiring, the nature of preoperative and postoperative imaging (i.e. PA view mandible, Lateral oblique view, Orthopantomogram). The results of treatment were analysed in terms of occlusal stability achieved, absence of malunion at fracture site, absence of gap at superior border of mandible on postoperative imaging, absence of infection at fracture site, absence of miniplate fracture or dislodgement of screws.

In all cases, preoperative intermaxillary fixation (IMF) was obtained with Ehrich arch bars or eyelet wiring technique. After the preoperative wiring, open reduction and internal fixation was done in operation theatre, with 2.5 mm miniplate osteosynthesis system. The parasymphysis fractures were exposed through intraoral vestibular approach, whereas the fracture of angle of mandible was exposed through extraoral Risdon's incision. IMF was confirmed at the end of the surgery along with absence of malocclusion. In patients where occlusion was deranged preoperatively, two miniplates were applied at the parasymphysis and one miniplate was applied at fracture line in angle of mandible near the lower border. Miniplate was not applied at upper border of angle of mandible due to presence of impacted tooth at that site.

RESULTS

A total of 5 cases satisfied the inclusion and exclusion criteria. All 5 patients were males, with an age in range of 16 to 24 years. In 4 patients the etiology was road traffic accident while in one patient, the etiology was assault. In 3 of the patients, there was fracture of left mandibular parasymphysis and right angle of mandible. In the remaining two patients, there was fracture of right mandibular parasymphysis and left angle of mandible. In all patients, impacted mandibular third molar was present in line of fracture at angle of mandible. In all these cases, the tooth was mesioangular in position. The tooth was unerupted in 4 cases and partially erupted in one case. The fracture lines were favourable in five cases at the angle of mandible and in four cases at the parasymphysis. Ehrich arch bars were applied preoperatively in 3 cases, including the case with unfavourable fracture of parasymphysis. In rest of the 2 cases, eyelet wiring was done.

Postoperative clinical examination was done at day 1, 2, 7, 14, 28 and 60. Postoperative radiologic examination was done at day 7, 14, 28 and 60. On postoperative examination, none of the patients showed malunion at fracture site. No patient demonstrated gap at superior border of the mandible. None of the patients showed malocclusion. There was no incidence of fracture site infection, plate fracture or dislodgement of screw. The IMF was released at 3 weeks in all 4 cases of favourable fractures, while it was released at 4 weeks in case of unfavourable fracture.

Figure 1: Preoperative radiograph of patient operated in 2012.

Figure 2: Postoperative orthopantomogram of patient operated in 2015.

DISCUSSION

This study is focused on a select group of patients with peculiar kind of fracture lines and presence of impacted mandibular third molar in fracture line at angle of mandible. All fractures at angle region were favourable, while four out of five fractures at parasymphysis were favourable. Due to presence of impacted tooth at angle region of mandible, no miniplate was applied at superior border of angle of mandible. Single miniplate of 2.5 mm was applied near lower border in the angle region. In case of fractures of parasymphysis, single miniplate was applied in the four favourable fractures and double plates were applied in one unfavourable fracture. In all cases IMF was maintained for at least 3 weeks. In case of unfavourable fracture at parasymphysis, IMF was maintained for 4 weeks. All the cases showed adequate union of fractures at the end of 2 months follow-up along with absence of malocclusion, absence of plate fracture, absence of postoperative infection.

CONCLUSION

A peculiar set of mandibular fractures treated in a setup of rural background with limited facilities achieved adequate union at fracture site without any complications.

Conflict of interests

The author declares that there is no conflict of interests that could influence this work.

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The author declares that there was no financial aid obtained from any source for the preparation of this manuscript.

Ethical approval

Since the author is not working at the same hospital at present time, it was not possible to set up a review board for ethical approval. Instead, approval was obtained by telephonic conversation with concerned authorities. It was decided not to reveal the photographs of patients in the manuscript and not to mention the name of the hospital.

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