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MANAGEMENT OF MANDIBLE FRACTURES AT TERTIARY CENTRE

Plastic Surgery

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ABSTRACT

Background: To evaluate the cases of mandible fractures treated by open reduction and rigid fixation at the B.J Medical college, Ahmedabad.
Methods: Two hundred and forty mandible fractures cases were treated by open reduction and rigid fixation from September 2011 to September 2017. These were retrospectively analyzed based on the following patient related factors i.e. mode of injury, age and sex distribution, site of injury, associated injuries and surgical treatment.
Result: The significant finding was that the most common etiology for fracture mandible was road traffic accidents (RTA), 216 (90%). Of the patients who reported, 205 (85.5%) were males in the third decade of life. 108 (45%) patients had parasymphysis fractures, 74 (30.5%) had angle fractures, 36 (15%) condylar fractures, 19 (7.9%) body fractures and 3 (1.6%) had ramus fracture. Early intervention using open reduction and internal fixation was the protocol followed, based on which results were studied.
Conclusion: As RTA especially two wheelers accidents appeared to be the most common cause of mandible fractures. Most commonly males suffer mandible fracture. Moreover open reduction and rigid internal fixation appears to be the suitable treatment modality in successful treatment of mandible fractures in reducing morbidity and complications and ensuring early return to normalcy.

KEYWORDS

INTRODUCTION:

The increasing number of vehicles and the deleterious condition of roads has led to a significant increase in craniofacial trauma. Mandible fractures occupy the second most frequent incidence of facial bone fractures, with incidence of about 38% [1,2] . These are mainly caused by two-wheeler accidents. The mandible is a resistant bone and it takes a relatively heavy impact to fracture, which apart from road traffic accidents (RTA) can also be a consequence of sport activities, firearms, interpersonal violence, work-related accident and pathological conditions. Mandible fracture is a break through mandible. In about 60% of cases the break occurs in two places. It may result in a decreased ability to fully open the mouth .Since the mandible is the mobile facial bone, a fracture is generally never left unnoticed because it is very painful, worsening with mastication and speech movements and if left untreated may cause facial asymmetry. Mandible fractures may lead to deformities, either due to displacement of the fracture fragments or non-restored bone losses, with a disturbed dental occlusion. Intraorally, if the fracture occurs in the tooth bearing area, a step may seen between the teeth on either side of the fracture or a space can be seen (often mistaken for a lost tooth) and bleeding from the gingiva in the area. There can be an open bite where the lower teeth, no longer meet the upper teeth. In the case of a unilateral condylar fracture the back teeth on the side of the fracture will meet and the open bite will get progressively greater towards the other side of the mouth. Consequences of untreated or inappropriately treated mandibular fractures may be severe, both cosmetically and functionally. The present study was aimed at assessing 240 patients, who were admitted in our tertiary centre, who were treated for mandible fractures at B. J. Medical College, Ahmedabad. Study is aimed at assessing the trend of mandible fracture according to gender, age, etiology, location of fractures, treatment techniques and postoperative complications in a tertiary hospital setup.

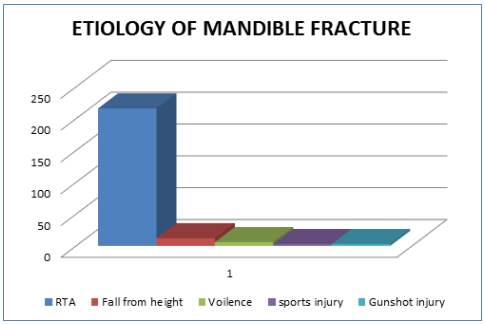
MATERIAL AND METHODS:

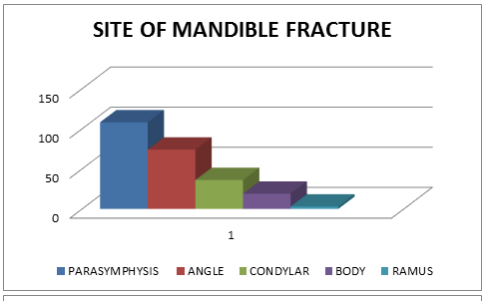
Patients reporting to the outpatient department or casualty with maxillofacial trauma or transferred from peripheral service hospitals, who were admitted in our department of B.J Medical college with a diagnosis of mandible fractures from September 2011 to September 2017 were treated by open reduction and internal fixation with platting. We performed an observational epidemiological, descriptive and retrospective study of the medical records of these cases. Since 2011, complete digital records of pre operative, operative and postoperative clinical photographs with pre operative and postoperative radiological and photographic records are available. The average time from reporting to surgical intervention was four days. The diagnosis was based on clinical and radiological examination. The standard radiological investigation used was 3D CT Face with reconstruction plate. All cases were treated under general anaesthesia by open reduction and internal fixation following maxillomandibular fixation (MMF) using an arch bar with rigid fixation. The sequence of rigid fixation was distal to proximal, tackling the dento alveolar fractures first. The surgical approaches used to access the fracture site were transoral for parasymphysis, body and angle fractures. Some angle of mandible fractures were approached from external approach. For the low subcondylar and condylar fractures, retroauricular approaches were used. MMF with elastics was done in the preoperative and initial postoperative period. MMF was maintained for a period of three weeks following which it was removed once desired dental occlusion was maintained.

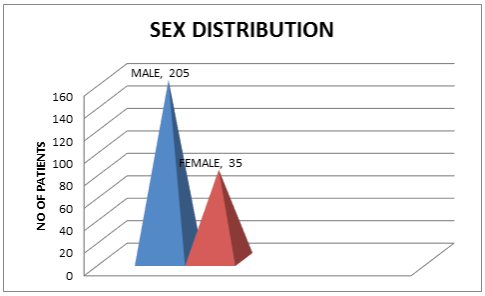
RESULTS:

In the last six years there has been no significant change in etiological factors, with RTA being the major contributory factor. The quantum of fractures has shown an insignificant increase with respect to craniofacial region including the mandible. There was a significant rise in the number of cases in the monsoon and the post monsoon period with significant rise in male population. Mandible fractures comprised of 53.5% of the total cases reporting with maxillofacial trauma. 15.5% cases had associated injuries of the maxillofacial region; of which zygomatic complex fractures was 9.1 %, dentoalveolar fractures 3.3 %, Lefort I fractures 2.8% and Lefort II 0.3%. RTA-216 (90%) was the most common etiological factor followed by fall - 12 (5 %), interpersonal violence -6 (2.5%), sports injuries -3 (1.4%) and gunshot wounds (GSW) -3 (1.1%). Age distribution with decreasing incidence rates were: third decade (51.5 %), fourth decade (24.4 %), second decade (17.7%), fifth decade (3.6%), sixth decade (2.2%), seventh decade (1.1%) first decade (0.7%) and eighth decade (0.7%) out of which 85.5 % were males and 14.5 % females. Site distribution was: 108 (45%) parasymphysis, 74 (30.5%) angle, 36 (15%) condylar, 19 (7.9%) body and 3(0.9 %) ramus, of which 136 (57%) were single mandible fractures and 104 (43%) were cases with multiple mandible fractures. The average time from injury to surgical intervention was four days. All cases were treated by open reduction and internal fixation using miniplate. The clinical presentation of patients when they first arrived at hospital comprised of specific signs and symptoms of trauma (pain and local edema), with specific features of mandible fracture (difficulty to open the mouth, deviation on opening the mouth, malocclusion). Complete workup of the patients was done which included a detailed history and hematological and urine examination. Radiological investigation was based on the site of injury and the presenting clinical features. All facio-maxillary injury patients were investigated with 3D CT Face with reconstruction plate. Computed

tomography (CT) scans of brain were performed in cases of concomitant head injury and / or pan facial trauma cases. All patients were investigated with chest radiograph, ECG and blood sugar (fasting / postprandial) was done as a part of pre anesthetic checkup protocol. The surgical protocol followed for fracture fixation was based on Champy's lines of osteosynthesis. Miniplates were used in all cases for rigid internal fixation. Two miniplates were used one at the lower border and one below the root apices were used for the parasymphysis region fractures, one plate at the surgical angle for the angle fractures and one or two plates for the subcondylar fractures parallel to the posterior border of the ramus. Postoperatively antibiotics and anti inflammatory medication were given for three days. The patients were allowed liquid diet from the first postoperative evening. Facial skin sutures were removed after one week. Radiographs were obtained postoperatively prior to discharge and after six weeks. The most common complication resulting from the treatment of mandible fracture was minor clinical occlusal discrepancy during the early postoperative period. This was managed successfully by MMF using elastics in the postoperative period. 18 of the 240 (7.5 %) cases treated with mandible fractures had persistent occlusal discrepancies that persisted in the postoperative phase. These discrepancies were essentially the inability of the patient to interdigitate the maxillary and mandibular teeth in maximum intercuspation. Most of these were seen in subcondylar fractures where the surgical procedure results in inflammation of the temporomandibular joint resulting in this problem. Guiding elastics and regression of inflammation helps resolve this problem. The other postoperative complication we faced were infections at the site of rigid fixation in 10 cases, which were successfully managed by surgical removal of the implant after the healing phase.







DISCUSSION:

Although being the heaviest and strongest facial bone, the mandible is prone to fractures because of the anatomical peculiarity of form and location. There has been an increase in number of traffic accidents contributing to an increase in the frequency of mandible fracture [1-4] . The age range of third decade was the most affected [5,6] . The male predominance in the age range 20-29 years is due to the increased use of two wheelers by this group and also the prevalent interpersonal violence, under influence of alcoholic beverages. This gender bias observed in our study is in agreement with the existing literature [7,8] .Males were most commonly affected by mandible fracture. The causes of fracture were extremely variable. In the present study, the decreasing order of frequency found was: road traffic accidents, interpersonal violence, fall from height, and other factors. Others present interpersonal violence [9] . We classically find a set of signs and symptoms comprising of pain, edema, hematoma, deranged dental occlusion, facial contour deficit, grating and mobility of bone fragments.When these patients came in emergency we stabilized fractures with inter dental wiring. The radiological investigation done was 3D CT Face with reconstruction plate. Most mandible fractures in the present study occurred in isolation. Although the total incidence of associated maxillofacial fractures was lower than that reported in most studies, zygomatico-maxillary complex was the most common associated site. Out of the nearly 37 cases that had associated injuries of the maxillofacial region with concomitant mandibular fractures, 90% of these were encountered in the last two years. This could be due to the increased speeds of vehicles and increased density of two wheelers in the last few years. Along with increased use of high speed vehicles. The mandible fracture site is variable, depending on the many different causes of the fracture. What was significant is that there was a gradual change in incidence of mandible fractures from single fractures to multiple areas of fracture over this period. Of the multiple regions affected, 63 of the 108 involved the parasymphysis and opposite angle, 22 involved parasymphysis and opposite subcondylar region, 18 were bilateral angle fractures, nine were bilateral parasymphysis fractures, 12 were body and parasymphysis fractures, rest had an added component of dent alveolar fractures. Literature differs a lot concerning the affected sites and pattern changes according to local demographic changes and pattern. In the present study, the parasymphysis and mandibular angle were the most affected. There are many different therapeutic possibilities, given that many authors disagree about the best treatment approach [10] . The objective of therapy includes absence of pain, satisfactory dental occlusion, facial symmetry and improved patient satisfaction. At our institution mandible fractures were treated with two basic forms of treatment, either open or closed approach. Closed treatment was used in children. Open treatment has been the protocol for all mandibular fractures in adults at our institution. The surgery, which is based on the principle of reduction and fixation of bone fragments, should be conducted as soon as clinical conditions allow. Most patients were discharged after seven days, confirming postoperative complications. In the present study, there was a predominance of males in the second and third decade of life reporting with maxillofacial injury consisting of mandible fractures. The most common cause was road traffic accident and the more frequently affected region on the mandible was the parasymphysis and angle respectively. Most patients were treated by open reduction within the first four days and were discharged after the early postoperative period. The most frequent complication encountered was that of transient malocclusion which were successfully corrected with rubber fixation.

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