Original Research Paper

Volume-8 | Issue-2 | February-2018 | PRINT ISSN No 2249-555X

Plastic Surgery

STUDY ON MANDIBULAR FRACTURES IN AGRICULTURAL WORKERS

Dr.K.Boopathi* MS,M.Ch., Associate Professor of Plastic Surgery, Chengalpattu Medical College and Hospital, Chengalpattu,Tamilnadu. *Corresponding Author

Dr.V.Govindaraj MS., Resident in MCh Plastic Surgery, Chengalpattu Medical College and Hospital, Chengalpattu, Tamilnadu.

ABSTRACT Mandible is the second most common facial fracture. There has been a significant increase in the number of cases in recent years with the advent of fast moving automobiles. This study was undertaken to study mandibular fractures clinico radiologically with an aim to calculate incidence and study pattern and the commonest site of fractures in population in and around Chengalpattu in Kanchipuram district. Patients presenting with history of trauma at agricultural work in various places in and around Kanchipuram district with maxillofacial injury were included in this study. Detailed case history was recorded followed by thorough clinical examination, and radiological interpretation was done for establishing the diagnosis and the data obtained was analyzed statistically. Out of 141 patients with mandibular fractures, highest percentage was found in 21–35 years of age with male predominance. Road traffic accidents were the most common cause of fracture with para symphysis being commonest site. Second Commonest combination was para symphysis with sub condyle. The incidence and causes of mandibular fracture reflect trauma patterns within the community and can provide a guide to the design of programs geared toward prevention and treatment

KEYWORDS : Fracture mandible, ORIF, Road traffic accidents

Introduction

Faciomaxillary injuries represent an extremely stressful experience and causing an acute and long-term functional, psychosocial and economical impairment to the patient. The face is the most exposed part of the human body, and susceptible to injuries in farm-related accidents. Occupational accident in the maxillofacial region rates 0.9-5% and, in some cases, can reach 9%. Based on their occupation, patients are classified as farm and forestry workers, construction workers, factory workers, craftsmen, service workers, and office workers. This paper describes a farm-related maxillofacial trauma in our Kanchipuram district

At present most of the articles are presents with accidents in highways, very less presentation are available regarding the rural population and rural accidents. mandibular fractures are the most common of all maxillofacial fractures because the only mobile bone of the facial skeleton and also more vulnerable because of its mechanically weak components, including the angle, the condylar process, and both sides of the mentum As early as In 1650 BC Egyptian papyrus described about the examination, diagnosis, and treatment of mandible fractures The description of mandibular fracture, and most patients received either improper treatment or no treatment. Hippocrates was the first to describe reduction and immobilization through the use of circum dental wires and external bandaging. Importance of establishing proper occlusion was first described by Salerno, Italy, Maxillo-mandibular fixation was first mentioned in an edition of the book Cirugia printed in Lyons, 1492. Chopart and Desault used dental prosthetic devices to immobilize fracture segments[3].

In 19th century, when Gilmer reformed the treatment of fractures by fixed full arch bars on the mandible and the maxilla4. In 1888, Schede was the first to use a solid steel plate held by 4 screws for fixation5.The technique of rigid internal fixation was developed and popularized by Arbeit sgemein schaftfur Osteosynthese fragen/Association for the Study of Internal Fixation (AO/ASIF) in Europe in the 1970s. The basic principles of the AO, outlined by Spiessl, is primary bone healing under conditions of absolute stability[6]. Rigid internal fixation must neutralize all forces (tension, compression, torsion, shearing) developed during functional loading of the mandible and allow for immediate function.

AO reconstruction plates also impacted the management of comminuted and infected mandibular fractures; Ellis reported a 7.5% infection rate in treatment of mandibular angle fractures with an AO reconstruction plate without intermaxillary fixation (IMF).

During the same time that Spiessl was expounding the AO doctrine, Champy et al in France were developing the concept of adaptive osteosynthesis. Champy advocated transoral placement of small, thin, malleable, stainless steel miniplates with mono cortical screws along an ideal osteosynthesis line of the mandible. Champy believed that compression plates were unnecessary because of masticatory forces that produce a natural strain of compression along the inferior border7.

These 2 changes of AO rigid internal fixation and the Champy method of monocortical miniplates revolutionized the treatment approach to mandibular fractures. Many fractures previously treated with closed reduction or open reduction with wire osteosynthesis are now commonly treated with open reduction with plate and screw fixation. An example of this evolution is the treatment of comminuted mandibular fractures.

Aim and objective

To analyze the trend in mandibular fractures in agricultural workers.

To analyze the, etiology, anatomic distribution age and gender distribution of mandibular fractures and outcome of the mandibular fractures in agricultural population

Inclusion Criteria

- All patients referred for mandible fracture with or without other faciomaxillary injuries
- A level of mental status permitting an adequate neurosensory examination and cooperation.
- Patients who have had a follow up of minimum of 6 months.

Exclusion Criteria

- Patients below 10 years of age
- Fracture with the head (brain) injury
- Patients with repeated admissions and incomplete information were excluded from this study

Materials and Methods

A prospective study was designed to analyze patients fulfilling the inclusion criteria. The data was collected and preserved in a specifically designed protocol. Etiology, fracture characteristics, treatment, sensory disturbances (if any) were recorded. Patients were followed up for a minimum of 6 months. The study sample was derived from the series of patients with mandibular fractures evaluated and treated by the Department of Plastic Surgery in Chengalpattu Government Medical College Hospital, between January 2015 and June 2017. Institutional ethical clearance obtained & guidelines of strictly followed. Written consent obtained from the patient and caregivers.

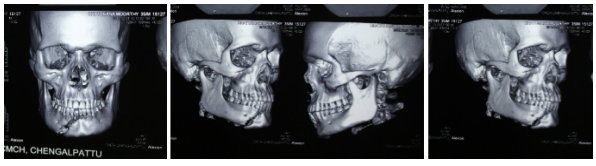
Patient Population and Data Collection

Patients referred from the Department of trauma and general surgery for maxillofacial injuries are included. 244 participants with maxillofacial fractures had complete diagnostic records. Data on age, sex, soft tissue injuries, dental trauma, and maxillofacial fracture type were collected and standardized by an investigator on the basis of the case histories, clinical and radiographic examinations, and medical records of the patients.

Based on the anatomical site involvement Mandibular fractures were classified as condylar (unilateral or bilateral), symphysis, body, angle, ramus, and coronoid fractures.

Per-operation pictures:

CT-Facial Bone:



Results

we observed that, total number of patients included were 141, Isolated mandibular fracture in 92 patients among them unilateral fractures were 68 (73Bilateral fractures 24 (26%) %), among the isolated fractures involving right side were 46 (69%) and left side were 22 (31%). 49 patients (34.7%) treated for associated faciomaxillary injuries, symphysis 10 (10%) and Of 10 symphysis fracture three cases had unilateral canine impaction which were seen in OPG.

Total number of mandibular fracture 141

Most common cause of fracture was road traffic accidents (RTA) 110 (78.6%) followed by fall injury 20, bull gore injuries 5 cases, Assault 3 cases Tractor injuries, 3 .

Etiology of mandibular fractures
Among unilateral fractures, the most common site was para symphysis and in bilateral # body was the more common. The ramus is the least common site.

Distribution of mandibular fractures according to anatomic site
The order of fracture site from most common to least common were para symphysis 40,28%49 (32.45%), body11,8.5 % 42 (27.8%), angle 20 14%,22 (14.56%), symphysis 10 (11.9%), condyle12,9.1% 13 (8.6%), coronoid 4 (2.64%), and lastly the ramus 5.3.5 %3 (1.98%)

Anatomical and gender distribution of mandibular fractures
In his study we observed that female gender was significantly associated with body and angle fracture with significant relationship between etiology (assault) and multiple site fracture such as para symphysis-angle, body-condyle, body-angle, and symphysis-condyle.

Discussion

The etiology for mandibular fractures have changed dramatically with the arrival of higher speed vehicles especially two wheelers. Mandible being similar to an architectural arch distributes the applied force along its length but not being a smooth curve in a uniform cross-section. In mandible there are parts at which force per unit area developed is greater resulting in increased concentration of tensile strength leading to a fracture at the site of maximum convexity of the curvature. The bone fracture at site of tensile strain where their resistance compressive force is greater.

Most frequent cause of fracture mandible in this study was RTA, which is in accordance with Luce*et al*., [18]Bataineh,[19]Shah*et al*.,[20]Al Ahmed*et al*.,[21] and Brasileiro and Passeri[22] and alcohol abuse during driving. This is due to increasing number of vehicles especially two wheelers in recent times among the rural population and also high-speed driving along the poorly, faulty designed village panchayat roads without helmet and safety guide lines. Another factor is using cellphone while driving. One of the commonest cause for more number RTA in rural areas are due to stray dogs and cattle's come across and hit the speedy vehicles .

Males are predominantly affected, which is in agreement with other studies[8,17]due to more involvement in outdoor activities also most of them are agricultural workers and transport heavy luggage's in two wheeler, also not realize about the importance of wearing helmet and helmet laws, and bad shape of the rural roads[16]

In this study, fall from height is the second common etiologic factor accounting for 42.6% of the cases.

The anatomic distribution and incidence of mandibular fracture are widely variable[23] Many authors reported symphysis[24] as the most frequently affected site whereas, others reported this to be mandibular body,[2,8,17,19] angle[16,25,] and condyle[20,21]

In our study, the para symphysis was the most frequently affected site probably it is due to length of canine root making the mandible anatomically weak in this region leading to most fractures.

Among multiple fracture we observed that the para symphysis was commonly associated with angle, which is in accordance with the study by Dongas and Hall[25] and contrary to Ogundare*et al*[26] have reported body with angle as the most common combination.

The second commonest combination of fracture in our study is para symphysis with sub condyle accounting for 18.8%, probably due to the horizontally directed impact to para symphysis resulting fracture at the site of impact, this axial force of impact against para symphysis proceeded along the mandibular body to the cranial base through the condyle leading to the concentration of the tensile strain at the condylar neck hence resulting in its fracture.

This is in contrary to Dongas and Hall [12]who found para symphysis with angle, Ogundare et al. [16] reported body with angle as the commonest combination.

The age incidence in this study increased with age above 20-35 (54 %) years and the second common age group is 10-20 years with 14cases with (9.92%)

As the age progresses, they are more involved in physical activities such as fast and rash driving, interpersonal violence, alcohol abuse.

This study revealed that due to lack of education and unawareness of traffic rules most of the fractures occur in a rural population

In our study 70 % of the patient underwent ORIF without MMF. In second group comprising 30 % ORIF done with MMF. Outcome is equal in both groups in Post-operative period.

In our study one mandible # needs miniplate removal after 1.month.due to infection

Conclusion

We noticed that most common cause was RTA because of increasing number of vehicles. The sheer pace of modern life with high-speed driving as well as an increasing violent and intolerant society have made facial trauma a form of social disease. Faulty road design too was a major reason for accidents. The State transport department had recently embarked on several measures to contain accidents, starting with enforcement of the helmet rule and making driving license mandatory for purchase and registration of vehicles. Banning of use of cellphone during driving. We also believe that imposing strict transport law might reduce the mandibular fracture

Reference

1. Ansari SR, Khitab U, Qayyum Z, Khattak A. Retrospective analysis of 268 cases of fractures of the mandible. Pak Oral Dent J 2004; 24: 135-58.
2. Lipton JS. Oral surgery in ancient Egypt as reflected in the Edwin Smith Papyrus. Bulletin of the History of Dentistry 1982; 30: 108
3. Leonard MS. History of treatment of maxillofacial trauma.Oral Maxillofac Clin North Am. 2;1. 1990.
4. Barton JR. A systemic bandage for fractures of the lower jaw. Am Med Recorder Phila. 1819. 2:153.
5. Moon H. Mechanical appliances for treatment of fracture of the jaws. Br J Dent Sci. 1874. 17:303.
6. Spiessl B. Rigid internal fixation of fractures of the lower jaw. Reconstr Surg Traumatol.

1972. 13: 124-40.
7. Champy M, Loddé JP, Schmitt R, Jaeger JH, Muster D. Mandibular osteosynthesis by miniature screwed plates via a buccal approach. J Maxillofac Surg. 1978 Feb. 6(1): 14-21.
8. Ellis E 3rd, Miles BA. Fractures of the mandible: a technical perspective. Plast Reconstr Surg. 2007 Dec. 120(7 Suppl 2): 76S-89S.
9. Dario LJ. Implant placement above a bifurcated mandibular canal: case report. Implant Dent 11(3): 258-261, 2002.
10. Mbajiorgu EF, Mawera G, Asala SA, et al. Position of the mental foramen in adult black Zimbabwean mandibles: a clinical anatomical study. Cent Afr J Med 1998; 44(2): 24-30.
11. Neiva RF, Gapski R, Wang HL. Morphometric analysis of implant-related anatomy in Caucasian skulls. J Periodontol 2004; 75: 1061-1067.
12. Yosue T, Brooks SL. The appearance of mental foramina on panoramic radiographs. I. Evaluation of patients. Oral Surg Oral Med Oral Pathol 1989; 68: 360-364.
13. Solar P, Ulm C, Frey G, Matejka M. A classification of the intraosseous paths of the mental nerve. Int J Oral Maxillofac Implants 1994; 9: 339-344.
14. Shankland WE. The position of the mental foramen in Asian Indians. J Oral Implantol 1994; 20: 118-123.
15. Sawyer DR, Kiely ML, Pyle MA. The frequency of accessory mental foramina in four ethnic groups. Arch Oral Biol 1998; 43: 417-420.
16. Bavitz JB, Harn SD, Hansen CA, Lang M. An anatomical study of mental neurovascular bundle-implant relationships. Int J Oral Maxillofac Implants 1993; 8: 563-567.
17. Fishel D, Buchner A, Hershkowith A, Kaffe I. Roentgenologic study of the mental foramen. Oral Surg Oral Med Oral Pathol 1976; 41: 682-686.
18. Agthong S, Huanmanop T, Chentanez V. Anatomical variations of the supraorbital, infraorbital, and mental foramina related to gender and side. J Oral Maxillofac Surg 2005; 63: 800-804.
19. Mraiwa N, Jacobs R, Moerman P, et al. Presence and course of the incisive canal in the human mandibular interforaminal region: Two-dimensional imaging versus anatomical observations. Surg Radiol Anat 2003; 25:416-423.
20. de Freitas V, Madeira MC, Toledo Filho JL, Chagas CF. Absence of the mental foramen in dry human mandibles. Acta Anat (Basel) 1979;104:353-355.
21. Kieser J, Kuzmanovic D, Payne A, Dennison J, Herbison P. Patterns of emergence of the human mental nerve. Arch Oral Biol 2002;47:743-747.
22. Oguz O, Bozkir MG. Evaluation of location of mandibular and mental foramina in dry, young, adult human male, dentulous mandibles. West Indian Med J 2002;51:14-16.
23. Renzi G, Carboni A, Perugini M, Giovannetti F, Becelli R. Posttraumatic trigeminal nerve Impairment: a prospective analysis of recovery patterns in a series of 103 consecutive facial fractures. J Oral Maxillofac Surg 2004 62:1341-6
24. Poort LJ, Neck JW, Wal KG. Sensory testing of inferior alveolar nerve injuries: A review of methods used in prospective studies. J Oral Maxillofac Surg 2009; 67:292-300.
25. Poonja KS, Galinde GS. Evaluation of neurosensory deficits in maxillofacial surgery. J Contemp Dent 2014; 4(2): 72-6.