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Original Research Paper

Plastic Surgery

INCIDENCE AND MANAGEMENT COMPLEX PANFACIAL FRACTURES TREATED AT MAHATMA GANDHI MISSION HOSPITAL, AURANGABAD, MAHARASHTRA

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ABSTRACT

Background The aim of this study was to evaluate the clinical patterns of Panfacial fracture in 55 patients who were treated at MGM medical college, Aurangabad, Maharashtra, India between Jauary2013- 2023. **Material and Methods** A descriptive prospective hospital-based study was carried out to determine the demographics, a etiology, and management modalities among patients presenting with Panfacial fractures. **Results** 55 patients (40male, 15females) with confirmed Panfacial fractures on CT scan were recruited into the study. They were Panfacial fractures most frequently in the 21-30year old age group 20 patients (36.36%). The principal etiological factor was road traffic accidents 65.45%, falls 21.81%, work related 9%, assaults at 3.6%. The anatomical site involved were was Mandible -21, Nasoethmoid complex NOE-4 c, Cranial boes-5, LefortI-5 , LefortII-11, Lefort III-6, nasal bones -2 , dentoalveolar-2 . Associated trauma was seen in all patients. Average time to surgical procedure was from 48 hrs. to 7 days. **Conclusion** As road traffic accidents (RTA)is common preventable cause of Panfacial fracture, proper preventive measures and road safety precautions the incidence and morbidity associated with them can be significantly reduced. Significant functional and aesthetic problems associated with these can be solved with stepwise and meticulous planning to optimize the outcome.

KEYWORDS :

INTRODUCTION

The Panfacial fracture is result of high velocity trauma and poses a challenge in management. They account for 4%–10% of all facial fractures. Panfacial fractures are facial fractures that simultaneously involve the upper, middle, and lower thirds of the face (1,2). They are often associated with soft tissue injuries and loss of bony anatomical relations. Other associated injuries like head, cervical, and long bone injuries are seen at the time of presentation. Panfacial fractures if not managed properly can cause complicated aesthetic facial deformities and functional problems like derangement of occlusion, diplopia, or trismus improper occlusion impacting the quality of life of the patient.

Our study aimed to analyze the pattern, etiology, concomitant injuries, emergency intervention, clinical presentation, and management strategies of Panfacial fractures reporting to our department of plastic surgery at MGM medical college, Aurangabad, Maharashtra, India.

There is no consensus about the best approach for management of Panfacial trauma. Different sequences of reduction bottom-to-top, top-to-bottom, inside-out, and outside-in are used in combination to restore facial contour. Gruss et al recommended zygomatic arch reduction and malar projection firstly aiming to re-establish the outer facial frame before NOE or inner facial frame is reduced. Merville suggest the frontozygomatic suture line should be reduced first in Panfacial bone fractures because this important structure determines facial width and projection. (3,4). The "bottom-to-top and outside-in" approach is the most widely used method in the Panfacial bone reduction

MATERIAL AND METHODOLOGY

Study area design:

A descriptive prospective hospital-based study was carried out in patients presenting with Panfacial fractures at the MGM medical college, Aurangabad, Maharashtra, India between January 2013 –December 2023.

Study population:

All patients who presented with fractures of the upper, middle, and lower third of the face simultaneously during the study period were included, confirmed by CT scan to the department of Plastic Surgery were included.

Inclusion Criteria:

Patients with simultaneous fractures of the upper, middle, and lower third of the face.

Exclusion Criteria:

Patients with solitary fractures of the upper, middle, or lower third of the face, medically fragile patients, and those who did not consent to participate

Data collection:

Data collection was done through interviewing of the patients with Panfacial fractures where possible. Where the condition of the patient did not permit an interview, relatives or attendants of the patient were interviewed. Medical records and case sheets were referred to whenever necessary to collect additional information.

Data collection included the evaluation of involved side, age and sex distribution, trauma etiologies, symptoms, examination findings, fracture localizations, treatment time after the trauma, treatment procedure, and complications after treatment. Follow-up was established from date of initial assessment to the last clinical evaluation. The range of follow-up was from 3 to 36 months, with a mean of 6 months.

RESULTS:

The results obtained were reviewed and analyzed using frequency distribution.

In our study period from between January 2013 –December 2023 we had a total of 55 patients having Panfacial fractures.

Of Fifty-five patients 40 were male (72.72%), 15 were females (27.27%).

(Figure1). Panfacial fractures occurred most frequently in the 21-30year old age group 20 patients (36.36%) (Figure2). In 0-10 years, group we had 1 patient needing surgery.11-20years we had 4 patients (7.2%),31-40years 14patients (25.455%),41-50 group 12 patients (21.8%),51-60years 4 cases (7.2%)

The principal etiological factor was road traffic accidents 65.45%, falls 21.81%, work related 9%, assaults at 3.6%(Figure3).

The anatomical site involved were was Mandible in 21 cases (symphysis-3, body-8, angle-4, coronoid-1, condyle-5), Nasoethmoid complex NOE-4 cases, Cranial boes-5 cases, LefortI-5 cases, LefortII-11 cases, Lefort III-6 cases, nasal bones -2 cases, dentoalveolar-2 cases (Table1).

Associated trauma was seen in all patients (Table2). Of 35 cases of neuro trauma, 20 cases were mild head injury and needed only observation. Of remaining 15, 10 were moderate head injury of which 7 patients needed craniotomy and 3 managed conservatively.5 patients of severe head injury needed surgical intervention and prolonged ICU care more than 7 days. Of all 12 neurosurgery cases, 2 cases needed frontal bone fixation with titanium mesh and miniplates along with repair of CSF leak. Of orthopedic 14 cases all needed fixation of long bones which was done in same setting under one anesthesia.

Average time to surgical procedure was from 48 hrs. to 7 days. In cases of assault immediate intervention was done due to associated extensive soft tissue injury.

In terms of surgical approaches for ORIF, 67% (39 out of 55) underwent a bottom-to-top approach, while the remaining 33% (16 out of 55) underwent a top-to-bottom approach

No major complications were seen postoperatively. 2 patients had malocclusion issues both were cases where imf had to be removed earlier at 5 days due to neurosurgery issues, needed for oral access. These were successfully corrected by dental rehabilitation. Limited mouth opening issue was seen in 2 patients in initial follow-up first mouth, both were cases of bilateral condyle fracture associated with angle fractures were treated with Heister mouth opening Gag successfully. Enopthalmos was seen in 3 patients of blow out fractures was conservatively managed as patients also were not willing for any further surgical intervention. Transient hypoesthesia had improved in most of the patients in 3 weeks. Only 3 patients had infraorbital hypoesthesia for more than 8 weeks which recovered over period of few months, these were cases of direct fall from height.(Table 3)

Average hospital stay of pts was 10 days(7days to 45 days). Average time to surgical procedure was from 48 hrs. to 7 days. In cases of assault immediate intervention was done due to associated extensive soft tissue injury.

DISCUSSION:

This was a prospective, clinical study carried out on 55 patients, with Panfacial fractures. These injuries result in significant functional and aesthetic problems hence, stepwise and meticulous planning is necessary to optimize the outcome.

Panfacial fractures, which make up 4–10% of all facial fractures and have a male to female ratio of 3:1, are most frequently caused by high-energy traumas (5). The predominance of men in this patient population is a relatively consistent finding in most studies (6,7,8). This data may be explained as men a tend to involve in physical contact sports, and are more frequent drivers.

The peak incidence of mid-face fracture was found in the age range of 21–30 years, which is in accordance with other studies (9,10). From this analysis it was found that sport accidents and falls dominated in the first decade of life, traffic accidents, assaults and sport injuries were most prevalent in the second and third decade of life and accidental falls were frequent cause in the later decade of life.

In our study we found the etiology was RTA (66.45%), falls (21.8%), work-related (9%) and assault (3.6%). This is well matched with other studies (11,12). A significant proportion of these accidents are associated with drug and alcohol abuse, speeding and disregard for the use of seat belts and mandatory helmet. Shapiro et al (13) show Importance of protective devices seat belts and helmets on morbidity and mortality, shown to reduce both the frequency and severity of facial injuries and protect motorcyclists and reduce the prevalence of maxillofacial fractures.

Panfacial fractures frequently associated with other life threating injuries like thoracic, intracranial, and intraabdominal traumas, which can be more life-threatening than the Panfacial fractures themselves (14), require management of concurrent injuries.

The important aspect of Panfacial trauma management is securing the airway on arrival and intraoperatively the preference for tracheostomy in complex cases (15).

Associated spine injuries can lead to risk of pose of hemiplegia or quadriplegia which are serious risks even before examination of a patient with Panfacial trauma. Hence to be carefully ruled out during initial assessment in the casualty department. Our study did not have any associated spine injury patients.

Reconstruction of Panfacial trauma needs consideration of using the vertical, horizontal, and sagittal buttresses of the face as the reference guide. Top-down sequencing or vice versa in bottom-top sequencing or combination of these sequences may sometimes be necessary for the ideal restoration of facial contour (16).

The treatment outcomes and the approaches adopted (majority being the bottom-to-top approach in ORIF 67% cases in our study) indicate the complexity and the need for individualized treatment plans for each case.

The longer duration of hospital stays and the extended time to surgery for Panfacial trauma patients compared to other maxillofacial injuries emphasize the resource-intensive nature of managing these cases. Although early intervention is best preferred, Panfacial trauma patients require special attention for associated life threating injuries , and hence the surgical procedure may be delayed. Average time to surgical procedure was from 48 hrs. to 7 days.

In cases of assault immediate intervention was done due to associated extensive soft tissue injury. The increase in time to surgical intervention is associated with problems like malunion of fractures, shrinkage of soft tissues, and scarring may occur, all of which make the delayed treatment cumbersome (17). Average hospital stay of pts was 10 days(7days to 45 days). Extended hospital stays with special care during the post-operative period and follow-up as thus required for Panfacial traumas.

Panfacial fractures are managed through systematic sequencing steps focusing on the occlusion as the foundation for proper alignment.

CONCLUSIONS

Panfacial fractures remain are complex injuries as result of RTA frequently. Commonly are associated with other potentially life threating injuries. Use of protective devices, strict laws and severe punishments for violators must be implemented to reduce the frequency of these complex fractures. These injuries result in significant functional and aesthetic problems hence, stepwise and meticulous planning is necessary to optimize the outcome.

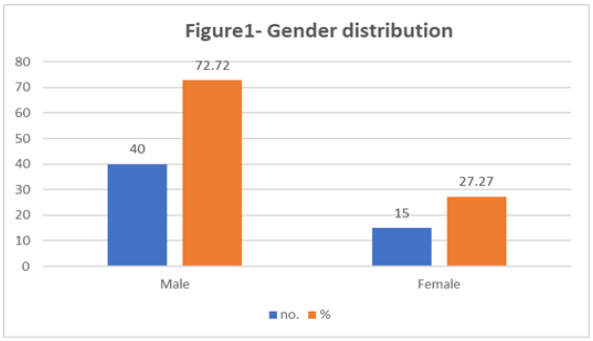

Figure 1 : Gender distreibution.

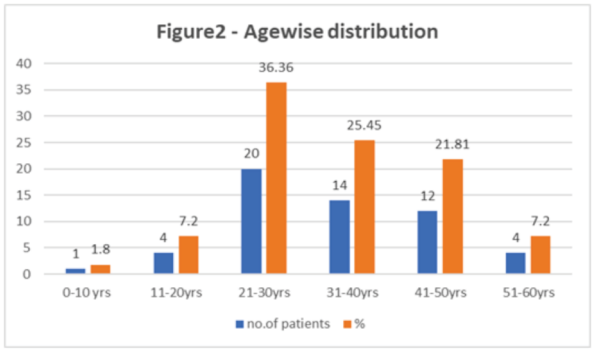

Figure 2 : Age wise distribution

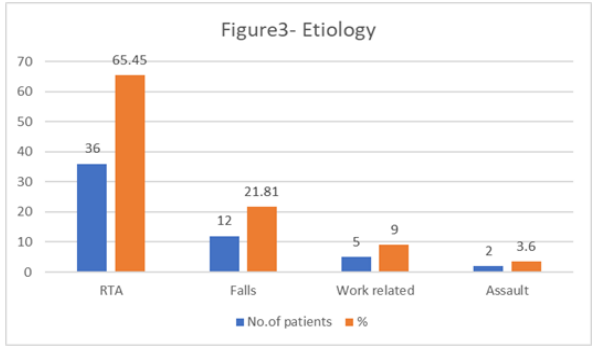

Figure 3 : Etiology

Table1 – Region wise distribution

Region	Frequency	Percentage
Mandible	21	
1. Symphysis	3	5.4
2. Body/parasymphysis	8	14.5
3. Angle	4	7.2
4. Coronoid	1	1.8
5.condyle	5	9
NOE	4	7.2
Cranial bones	4	7.2
Le Fort II	11	20
Le Fort I	5	9
Nasal bones	2	3.6
Dento-alveolar	2	3.6
Le Fort III	6	10.9
Total	55	

Table 2 –Associated Trauma

Asociated trauma	no.	%
Neurosurgery	35	63.63
Orthopaedic	14	25.45
Abdominal	2	3.6
Thoracic	1	1.8
occular	3	5.45
Total	55	

Table 3 – Complications

Complications	no.	%
Malocclusion	2	3.6
limited mouth opening	2	3.6
enopthalmos	3	5.4
numbness	3	5.4

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