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Original Research Article

Clinical manifestations of nasoethmoid-central midface and lateral mid midface trauma: an analytical study

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ABSTRACT

Background: Patients with facial trauma were analyzed to determine the clinical presentation of fractures of the naso-ethmoid, mid and lateral face.
Methods: 61 patients in the trauma unit of Dayanand Medical College were prospectively analyzed during a period of two years (August 2013 to August 2015).
Results: Road traffic accidents were the major cause of fractures (72.13%) followed by assaults (14.75%) and falls (8.19%). The age group commonly affected was 21-30 years (54.09%) followed by 31-40 years (13.11%). Facial fractures were more in males, the females being 5 times less at risk. Epistaxis, swelling, tenderness, nasal obstruction, external nasal deformity and crepitus were noted in almost all patients. Ecchymosis, telecanthus and CSF rhinorrhea were noted in 90.9%, 72.7%, and 18.18% respectively. 90% presented with circumorbital ecchymosis, facial edema and anterior open bite. Other symptoms were epistaxis (81%), infraorbital nerve anesthesia and surgical emphysema (47.6%) and lengthening of face (42.8%). The commonest presentation was circumorbital ecchymosis (95.5%), subconjuctival hemorrhage (85.7%), flattening of cheek and step deformity at the infraorbital margin (81%). Facial edema was seen in 76% and trismus in 42.9%.
Conclusions: Common symptoms and signs of nasoethmoid fractures included epistaxis, swelling and tenderness, nasal obstruction, external nasal deformity and crepitus in all patients, circumorbital ecchymosis in 90% and telecanthus in 73%.

Keywords: Fractures, Naso ethmoid, Central midface, Lateral midface

INTRODUCTION

The human face being most prominent is susceptible to trauma, be it domestic, occupational, sporting activities, road traffic and vagaries of nature. The bony skeleton or the overlying soft tissues may be involved either individually or together.[1] Facial injuries damage the individual physically as well as emotionally, moreover long hospitalization and need of multiple surgical interventions drain one financially. Sometimes there is unexpected morbidity affecting the quality of life.[2,3] Naso-Orbito-Ethmoid (NOE) trauma with sustained facial fractures necessitate unique consideration from diagnostic and therapeutic aspects.[1] The primary presentation is often grotesque orbital swelling, periorbital ecchymosis, traumatic telecanthus with accompanying CSF rhinorhea. Central midface retrusion/intrusion is noticed later after recession of acute oedema.[4-7] Lateral midface, zygomaticomaxillary complex, or zygomatico-orbital

fractures are also vital injuries of the face, primarily indicative of mid facial trauma associated with fractures

Aim and objectives

Aim and objective of current study was to determine the clinical presentation of nasos-ethmoid, mid and lateral face fractures.

METHODS

A retrospective study of the records of 61 subjects admitted under Otolaryngology and Maxillofacial trauma units, during a period of 2 years (August 2013 to August 2015) at Dayanand Medical College and hospital were analyzed.

Inclusion and exclusion criteria

Facial fractures isolated or associated with other fractures and subjects with radiographic/imaging evidence of fractures were included. Patients dead on arrival and patients with nasal concussions were excluded.

Statistics

All statistical calculations were done using Statistical Package of Social Sciences (SPSS) 17 Version statistical program for Microsoft windows (SPSS Inc. released 2008. SPSS statistic for windows, version 17.0, Chicago).

RESULTS

Males outnumbered the females in the ratio of 5:1. Maximum patients 26, (54%) were seen in the age group 21-30 years and minimum at extremes of age.

Table 1: Age and gender distribution (n=61).

Age group (years)	N		Total	%
	Male	Female		
1-10	2	-	2	3.2
11-20	6	1	7	11.4
21-30	26	7	33	54.09
31-40	6	2	8	13.11
41-50	7	-	7	11.47
51-60	2	-	2	3.27
>60	2	-	2	3.2
Total N (%)	51 (83.6)	10 (16.3)	61	-

Epistaxis, swelling and tenderness, nasal obstruction, external nasal deformity and crepitus was noted in almost all patients. Echymosis, telecanthus and CSF rhinorrhea were noted in 90.9%, 72.7%, and 18.18% respectively. Ninety percent patients presented with circumorbital ecchymosis, facial edema and anterior open bite. The other symptoms in the decreasing order of frequency were epistaxis (81%), infraorbital nerve anesthesia and surgical emphysema (47.6%) and lengthening of face (42.8%).

Table 2: Symptoms and signs of nasoethmoid fractures (n=11).

Symptoms/Signs	N	%
Epistaxis	11	100
Swelling & tenderness	11	100
Nasal obstruction	11	100
Externalnasal deformity	11	100
Crepitus	11	100
Circumorbital ecchymosis	10	90.90
Telecanthus	8	72.7
CSF rhinorrhoea	2	18.18

Table 3: Symptoms and signs of central midface fractures (n=21).

Symptoms/Signs	N	%
CircumorbitaI ecchymosis	19	90.4
Facial edema	19	90.4
Anterior open bite	19	90.4
Epistaxis	17	80.9
lnfraorbitalnerve anesthesia	11	52.3
Surgical emphysema	10	47.6
Lengthening of face	9	42.8
Floating teeth & palate	2	9.5

Table 4: Symptoms and signs of lateral middle third fractures (n=21).

Symptoms/Signs	N	%
CircumorbitaI ecchymosis	20	90.4
Subconjuctival hemorrhage	18	90.4
Flattening of cheek	17	90.4
Step deformity infraorbital margin	17	80.9
Facial edema	16	52.3
lnfraorbital nerve deficit	9	47.6
Trismus	1	42.8
Epiphora	1	9.5
Diplopia	-	-
Proptosis	-	-
Increased interpupillary distance	-	-
Limitation of eye movements	-	-
Decreased visual acuity	-	-

The symptoms and signs of lateral middle third fractures are shown in (Table 4). The commonest presentation was circumorbital ecchymosis (95.5%), subconjuctival hemorrhage (85.7%), flattening of cheek and step deformity at the infraorbital margin (81%). Facial edema was seen in 76% and trismus in 42.9%.

DISCUSSION

Facial trauma can be simplified into naso-ethmoid, central and lateral third mid face fractures. Diagnosis and therapeutics in naso-ethmoid injuries is complex as

compared to the other sites. To intervene or not is of concern as there is likelihood of functional impairment and altered cosmesis, which maybe irreversible. The paired nasal lacrimal maxillary, ethmoid bones and the unpaired frontal vomer and sphenoid bones sandwiched between the eyeballs and beneath the anterior cranial fossa necessitate meticulous intervention to achieve facial symmetry. Disrupted canthal ligaments and the naso-lacrimal pathways leads to diplopia and epiphora. Naso-Orbito-Ethmoid (NOE) fractures are arguably the most difficult facial fractures from diagnostic and therapeutic points of view.[1] This is largely because the anatomic region consists of an intricate articulation of several small bony processes of the frontal, nasal, maxillary, lacrimal, vomer, ethmoid and sphenoid bones. It incorporates delicate structures such as the nasolacrimal drainage system and medial canthal ligaments.[4] The region is contiguous with vital anatomical areas including the anterior cranial fossa, the orbit and their respective contents. Because of the functional and aesthetic implications of injuries to this region, appropriate, timely and adequate diagnosis and treatment is crucial to avoid unfavorable sequel which are often difficult or sometimes, impossible to correct.[4] The key physical findings are often severe orbital swelling, periorbital ecchymosis, and traumatic telecanthus and CSF rhinorhea. Central midface retrusion/intrusion becomes evident after subsidence of acute oedema.[4-7] Thin-section computed tomography is generally regarded as the gold standard in defining the pattern of NOE fractures, the extent of adjacent fractures as well as for treatment planning.[8, 9] The diagnosis of nasoethmoid fractures was based on clinical presentation following injury in our study. The findings included epistaxis, swelling, tenderness, external nasal deformity and crepitus in all subjects. Telecanthus was seen in 72.7%, and CSF rhinorrhoea in 18%. The midface is anatomically complicated and closely associated with several important functions. Fractures in the mid-face may cause deformity of the midface, sensory disturbance, malocclusion, impairment of mandibular movement, and ocular dysfunction depending on the site and severity. In addition, midfacial fractures are sometimes associated with severe cranial injuries which often need to be primarily treated, even though the treatment of midfacial fractures is delayed or limited.[10] Therefore, the management of midfacial fractures requires a high level of expertise based on clinical evidence and also collaboration with other departments. In the present series, patients with central midface fractures presented with circumorbital ecchymosis, facial edema. Incidence of anterior open bite was in 90.4%, epistaxis in 80.9%, surgical emphysema in 47.6% and infra-orbital nerve anesthesia in 52.3%. Floating teeth and palate was noted in each case of alveolar and Le Fort 1 fracture. The lateral midface, zygomaticomaxillary complex, or zygomatico-orbital fractures are predominant injuries of the face, primarily representative of mid facial trauma in association to nasal fractures.[11,12] Reduction and fixation of the facial skeleton along with soft tissue reapproximation are the vital issues under consideration for an optimal outcome of lateral midface fractures. Inappropriate soft tissue management is consequent to a malposed eyelid, exposure of the cornea, hollowed temporal region, ptosis of the eye brow, descent of the midface, fistulae, and exposure of the palate. These deformities can possibly be circumvented by meticulous planning, incision and dissection. Moreover, the mid face necessities resuspension in the orbital rim to avoid descent. Premature aging of the affected side is due to midface descent or soft tissue sagging (STS). The latter even tugs eyelid inferiorly, leading to lid malposition, exposed cornea, as well as epiphora.[13-16] Individuals with lateral midface fractures in our series presented with circumorbital ecchymosis 95.2%, sub-conjuctival hemorrhage 85.7%, flattening of cheek and a step deformity at the infraorbital margin 81%, facial edema and infraorbital nerve anesthesia in 79.19% and trismus in 42.85%.

Limitations

It was a prospective study of a limited period of only two years and thus the numbers of subjects included were less. Moreover, due to financial constraints many patients left the trauma centre against medical advice or were referred to government facility even before getting admitted and before any radiological work up. Logistical issues resulting in delay in access to a tertiary health facility too may remain have been under reported.

CONCLUSION

Common symptoms and signs of nasoethmoid fractures included epistaxis, swelling and tenderness, nasal obstruction, external nasal deformity and crepitus in all patients, circumorbital ecchymosis in 90% and telecanthus in 73%. Common symptoms and signs of fracture of middle 1/3 of the face included circumorbital ecchymosis, anterior open bite and facial edema (90.4% each) and epistaxis (81%). The zygomatic complex fractures presented commonly with circumorbital (95%), subconjunctional hemorrhage (85.7%), flattening of cheek (81%), step deformity infra-orbital margin (81%), facial edema (76.19%) and infraorbital nerve deficit (76%). Most common symptoms of mandibular fractures included pain and crepitus (85%), palpable step deformity (80%) malocclusion (48.5%) and trismus (42%).

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