

Etiological Factors, Presentation and Management Outcome of Fracture Nasal Bones; A Study of 70 Patients at Tertiary Care Unit of Jinnah Hospital, Lahore

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ABSTRACT

Background: Fracture nasal bones are frequently seen in ENT practice and if not managed adequately, these can lead to problems like external nasal deformity and nasal obstruction. Regarding treatment options, there exists controversy among ENT surgeons. Treatment varies from conservative management to extensive open surgical procedures. This case series was conducted to know the etiology, presentation and outcome.

Study design: Descriptive study

Material and Methods: This retrospective study was conducted at ENT Department of Jinnah Hospital, Lahore from 2008 to 2010. Seventy patients (both male and female) of age range 5 – 60 years with class I and II fracture of the nose were included to assess outcome of various types of management. The diagnosis was based on clinical assessment with radiology requested to rule out other facial fractures and for medico legal cases. Patients were offered various types of management according to their presentation after trauma. Outcome of treatment were noted.

Results: Male to female ratio was 4:1. Main etiological factors were Road Traffic Accidents (RTA) (54.3%), falls (20%) and fights (15.7%). Incidence of class I fractures was 64.3% and class II was 35.7%. External nasal deformity (80%), pain & tenderness (76%), soft tissue swelling (55%) and epistaxis (41%) were the main clinical features. Closed reduction in 57.2%, open reduction in 4.2%, rhinoplasty with osteotomies was done in 20% of cases. Those who were managed conservatively were 18.6%. Over all successful management was achieved in 85.7%. Both local and general anesthesia was found almost equally effective.

Conclusion: Fracture nasal bone is seen commonly among young adult male. Road Traffic Accident (RTA) is the main culprit. Successful treatment is possible in majority of cases with multidisciplinary approach.

INTRODUCTION

The prominent position of the nose in human body makes it susceptible to isolated fracture from birth onwards. The nasal fracture refers to "a structural breach in the anatomical continuity of nasal bones and cartilages."¹

Nasal bone fractures are the third most common type of all fractures and the most common type of facial fracture (nasal fractures account for approximately half of the facial fractures).² Nasal fractures commonly follow blunt trauma and approximately 85% of cases result from motor vehicle accidents, falls and fights.³

Nasal fracture may be complicated with external nasal deformity, epistaxis, septal hematoma or abscess, nasal septal deformity and

cerebrospinal fluid leakage. It may be associated with other maxilla-facial and bodily injuries.⁴

Management of nasal fracture starts after ensuring a clear airway with adequate breathing and hemodynamic stability. The main objectives of the management are avoidance or treatment of complication and restoration of physiologic junction and cosmetic form of the nose.⁵ Most nasal fractures with resultant deformity are treated by closed reduction in the form of manipulation of nasal bones.⁶ However, some cases with persistent deformity may require open reduction in the form of septorhinoplasty for correction.⁶

The time lapse between the injury and presentation helps determine the type of management offered. If the patient presents before the development of soft tissue edema (within 1-3

hours) the above objectives can be achieved immediately by closed manipulation. If post traumatic edema has developed over the nose and surrounding tissues, it will obscure the deranged anatomy and renders the manipulation inappropriate.^{6,7}

This is challenging to decide that which technique is better for the reduction of the fracture. Closed technique is not meant for all fractures, neither all fractures require sophisticated procedures like septorhinoplasty. This study was conducted in order to document the different etiologies, presentations and management outcome of fracture nasal bone in our setup. This will help us in establishing prevention policies and management guidelines.

MATERIAL AND METHODS

Study Design:

Descriptive study

Sampling:

Nonprobability purposive sampling

Inclusion criterion:

Patients with class I and class II fractures of nasal bones were included

Exclusion criterion:

Patients with cerebrospinal fluid leakage and head injury were excluded from the study

Data Collection:

This study was conducted in Jinnah Hospital associated with Allama Iqbal Medical College, Lahore. This retrospective study included seventy patients with nasal trauma presenting in ENT Department of Jinnah Hospital Lahore during the year 2008-2010.

Management Protocol:

Patients of both sexes were included with age range between five and sixty years. Only those..Diagnosis of nasal fracture was based on detailed history and proper clinical examination further confirmed by radiographic findings. Patients were approached by different treatment strategies according to type of injury, severity of lesion and duration of trauma. Soft tissue trauma was cleaned stitched. Conservative treatment was offered to those with no significant deformity. Closed manipulation was offered to the patient with displacement and without edema. Either thumb

pressure or Walsham and Asches' forceps were also used. Rhinoplasty was done among patients with displaced fractures who presented with edema. The procedure was done after 14 days when edema got settled. All the data was collected in a specially designed peroforma.

Statistics:

All the data was analyzed using SPSS version 19.

Keywords:

Nasal fractures; etiology, presentation, management

RESULTS

Out of seventy patients included in the study, forty (67%) presented in CasualtyDepartment and twenty patients (33%) presented in Out Patient Department. There were fifty six male patients (80%) and fourteen female patients (20%). Thus male to female ratio was 4:1. The mean age of the patients was 28.12 + 6.89 years. Fifty two (74.4%) patients fell in the range 16 – 40 years. Seven (10%) patients were under fifteen years. (Table 1). There were thirty-eight patients(54.3%). with Road Traffic Accident (RTA).

Table 1: Distribution of patients by age

Age range	Number of Patients	Percent
5-15 yrs	7	10.0
16-25 yrs	30	42.9
26-40 yrs	22	31.4
41-50 yrs	8	11.4
50 yrs +	3	4.3
Total	70	100.0

Those with falls (20%) were fourteen. Eleven patients with fights/personal encounters (15.7%), four patients with sports injury (5.7%), two patients with work-place accidents (2.9%) and only one with trauma at home (1.4%). (Table 2) The most common clinical feature was external nasal deformity present in fifty six patients (80%). Then was tenderness (76%) and pain (73%). Intranasal bleeding was present in twenty-nine patients (41%) of which twelve (15.5%) needed active management by anterior nasal packing. Soft tissue swelling was found in thirty-eight patients (55%). Bony crepitus could be elicited in twenty-

eight patients (40%). Equal number were having nasal blockage. Eight patients (11.4%) were having soft tissue injury and two patients (2.8%) came with septal hematoma (Chart 1). Class I fracture of the nose was seen among 45 (64.3%) patients, while class II fracture in was seen among 25 (35.7%) patients.

Table 2: Distribution of patients by etiological factors

Etiology	No. of Patients	Percent
RTA	38	54.3
Fall Injuries	14	20.0
Fight Injuries	11	15.7
Sports Injuries	4	5.7
Workplace Injuries	2	2.9
Domestic Injuries	1	1.4
Total	70	100.0

Thirteen (18.6%) were managed conservatively. Fourteen were managed under local anaesthesia (20%) and forty-three (61.4%) under general anaesthesia. Thirteen patients (18.6%) were managed by conservative method. Forty patients

Table 3: Distribution of patients by Management

Management Modality	Frequency		Percent
Conservative management	13		18.6
Closed manipulation	by thumb pressure under GA	8	11.4
	Instrumental manipulation under GA	32	45.7
open reduction	3		4.3
Rhinoplasty	14		20.0
Total	70		100

DISCUSSION

In our study, 80% patients were male. This observation is similar to that described by Haugh who found 70 % male while Carroll found 94.5% male population^{8,9}. Both these studies validate our observation of male predominance thus indicating that male are exposed more to trauma than female.

Majority of patients (74.4%) were adult while only 10% were below 15 years of age. Many other studies have revealed similar results. In 1991, similar results were found by Carroll in 1995⁹. However nasal fractures were not

(57.2%) by closed manipulation, of which eight patients (11.4%) by thumb pressure and thirty-two (45.8%) by instrumental manipulation. Three cases were found suitable for open reduction (4.2%), and fourteen by rhinoplasty (20%)(Table 3). It was assessed during follow up that most patients (85.7%) were treated successfully with satisfactory results regarding external nasal deformity. Only ten patients (14.3%) were found with more or less unsatisfactory correction of nasal deformity. Mortality rate, related to trauma and management remained to zero-percent.

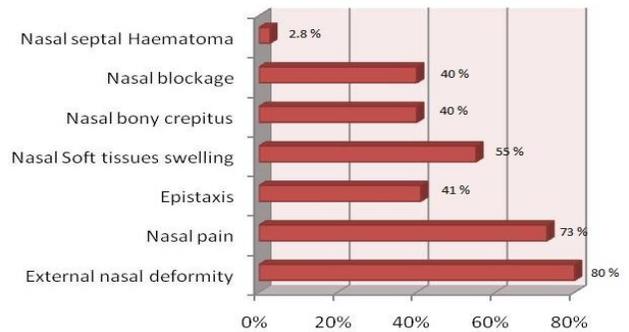


Chart 1: Distribution of patients by presenting complaints

uncommon in pediatric patients in our study constituting about ten-percent of patients. This is in contrast to Anderson who found that nasal fractures were uncommon in children¹⁰.

Most patients (67%) presented in emergency and rest of the patients (33%) presented via Out-Patient Department. Road Traffic Accident (RTA) was found 54.3% constituting the most common cause of nasal trauma. Twenty-percent were due to falls, 15.7% had personal encounter and fights while 5.7% had sports related facial injuries. Study of Muraoka in 1995, also revealed that Road Traffic Accident (RTA) was the most common

cause of nasal bone fractures¹¹. This finding is similar to that of our study. However he found fighting and personal encounter commoner than falls. Another study conducted in Pakistan in 1988, described falls (33.7%) as the most common etiological factor followed by road traffic accident (30.6%) and fights (8.8%)¹². These variations may be related to different social and geographical situations.

Out of seventy, twenty-nine patients forty one percent were having epistaxis, of which twelve (15.5%) needed active management by anterior nasal packing. Buahanan reported in 1983 that in a series of 312 patients eleven percent patients were having epistaxis which is similar to our finding¹³.

Septal hematoma was found in two cases (2.8%). Chaukuezi reported nasal trauma as a common cause of septal hematoma¹⁴.

In our study, successful reduction of nasal fracture was found in 70% of these thirteen patients. Owen conducted a study in 1992 and described that the success rate of complete reduction of nasal fracture under local anesthesia was found to be 71% and this was similar to that obtained in other studies that have used general anesthesia¹⁵. Cook also described in 1992 that simple fractures of nasal pyramid without significant septal deformity may be reduced as effectively under local anesthesia as under general anesthesia¹⁶.

Closed manipulation of the fracture of nose was performed among 57.2% patients within 3 weeks. Grymer described that most of cases of nasal trauma were reduced during two weeks after trauma¹⁷. Those presented after three weeks but before three months were managed by open reduction. Rhinoplasty with osteotomies or augmentation was done in 20% of cases, all having history of nasal trauma about one year back. Renne advocated open reduction for correction of nasal deformity after two weeks of nasal trauma¹⁸. This is in contrast to our approach. Augmentation rhinoplasty was done in two patients (2.8%). One with chondral cartilage graft and other with dorsal nasal prosthesis. Results were acceptable to the patients. Yadav described augmentation rhinoplasty acceptable to majority of patients in a series of forty cases of traumatic saddle deformity¹⁹. Breier studied a series of 243 cases of nasal trauma over a period of twelve years and advocated that nasal injury should be treated as early as possible with planned secondary corrections done only in rare indicated

cases²⁰. Locke has reported trigeminovagal reflex during repair of nasal fracture under general anesthesia in the University of Virginia Health System²¹. Keller has described toxic shock syndrome after closed reduction of a nasal fracture at Children's Hospital of Philadelphia²². There was no such event in our study and morbidity was found to be related with post operative pain, nasal blockage due to packing with associated mouth breathing and pain of nasal pack removal. There was no mortality associated with nasal fracture or its treatment.

CONCLUSION

This study concluded that fracture nasal bones are commonly seen among adult male. Road Traffic Accident (RTA) is the main cause followed by fall, fights, sports, workplace injuries and domestic accidents. There is no need for radiological evaluation for establishing the diagnosis. Successful treatment can be carried out in majority of the cases with closed manipulation while open reduction and rhinoplasty needed in only a few cases. The incidence of nasal bone fracture may be reduced by taking preventive measures to decrease the incidence of Road Traffic Accidents.

REFERENCES

1. Coleman BH. Diseases of the external nose in Hall & Colman's Diseases of the nose, Throat and Ears, and Head and Neck, edited by Bernard H. Colman ELBS: 14th ed. 1993; 17-18.
2. Sciberras NC, Borg Xuereb HK. Review of the financial and medico legal implications of nasal fractures seen at St Luke's Hospital 2008.
3. Muraoka M, Nakai Y. Twenty years of statistics and observation of facial bone fracture. Acta Otolaryngol Suppl 1998; 538:261-265.
4. Maran AGD. The fractured nose in Scott. Brown's otolaryngology: vol.4 edited by Ian S. Mackay and TR Bull: Butterworths: 5th ed 1987; 212-221.
5. Sykes JM, Donald PJ. Diagnosis and treatment of facial fractures in Otolaryngology, Head and Neck Surgery edited by John Jacob Ballenger and James B. Snow Jr. A Lea & Febiger Book, William & Wilkins: 15th ed. 1996; 369-389.
6. Hung T, Chang W, Vlantis AC. Patient satisfaction after closed reduction of Nasal Fractures. Archives of Facial Plastic Surgery 2007; 9:40-43.
7. Staffel JG. Optimizing treatment of nasal fractures. Laryngoscope. 2002; 112:1709-1719

8. Hugh RH, Prather JL. The closed reduction of nasal fractures: an evaluation of two techniques in *J. Oral Maxillofac. Surg* 1990; 1288-1292.
9. Carroll SM, Jawad MA, West M. One hundred and ten sports related facial fractures in *Br. J. Sports Med* 1995; 194-195.
10. Anderson PJ. Fractures of facial skeleton in Children in *Injury*. 1995; 47-50.
11. Muraoka M, Nakai-Y, Nakagawa K. Fifteen year statistics and observation of facial bone fracture in *Osaka City Medical Journal* 1995; 49-61.
12. Qiamuddin. Maxillofacial injuries in northern regions of Pakistan in *Journal of Postgraduate Medical Institute, Department of Publication PGMI, Peshawar* 1988;3:65-73.
13. Buchanan G, Holtman B. Severe epistaxis in facial fractures in *J. Plast Reconst Surg* 1983; 768-771.
14. Chaukuezi AB. Nasal septal hematoma in Nigeria in *Journal of Laryngology and Otology* 1992; 396-398.
15. OwenGO, ParkerAJ, WatsonDJ. Fractured-nose reduction under local anesthesia. Is it acceptable to the patient? In *Rhinology* 1992; 30:98-96.
16. CookJA, MurrantNJ, EvansK, LavelleRJ. Manipulation of the fractured nose under local anesthesia in *Clin-Otolaryngol*. 1992; 17:337-340.
17. Grymer LF, Gutierrez C, Stoksted P. Nasal fractures in children; Influence on the development of the nose in *Journal of Laryngology and Otology* 1985;735-739.
18. Renner GJ. Management of nasal fractures in *Journal of Otolaryngology.Clin Norht Am* 1991; 195-213.
19. Yadav SPS, Kohli GS, Geol HC, Goyal P. Augmentation rhinoplasty in *Pak. J. Otolaryngol* 1989;16-19.
20. BreierT, HemprichA. The surgical correction of the injured nose. A follow up study of 243 cases in 12 years, *Rev-Stomatol-Chir-Maxillofac*1993; 94:97-99.
21. LockeMM, SpiekermannBF, RichGF. Trigemino-vagal reflex during repair of a nasal fracture under general anesthesia in *Anesth-Analg*.1999; 88:1183-1184.
22. KellerJL, EvanKE, WetmoreRF. Toxic shock syndrome after closed reduction of a nasal fracture in *Otolaryngol-Head-Neck-Surg*. 1999; 120:569-70.