

Incidence, Evaluation and Management of Nasal Bone Fracture: Study of 60 Cases

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Abstract

Background: This is a study of 60 patients with nasal bone fracture treated at our hospital. They were analyzed for age and sex incidence, side prevalence, presentation and treatment options.

Methods: Through history was taken and examination was done and cases were investigated with CT scan or X-ray and then treated.

Results: Presentation was more in males (73%) than the females (27%). In our study, the most common cause of nasal bone fracture was road traffic accident (59%) and least common was trauma due to assaults. The most common investigation done was nasal bone x-rays (60%). Fracture bone reduction was done under local anesthesia or sedation in 87% of patients and general anesthesia in 13% of patients. Most of the affected patients with nasal bone fracture had lateral impact injury (70%) while others presented with frontal impact injury. Closed reduction of nasal bone fracture was done in most patients (77%), while others with linear non displaced nasal bone fracture were placed on medication.

Conclusion: The incidence of nasal bone fractures was found to be more in males due to their involvement in sports and adventures and those in the 11 to 30 year age group. Clinical presentation and x-rays of the nasal bone were found to be useful tools in the management of these fractures. Nasal fractures can be treated with good outcomes in the majority of patients with closed reduction. If proper treatment is not given in timely interval, nasal bone fracture may cause functional and aesthetic deformity.

Keywords: Fracture Nasal Bones; Closed Reduction; Frontal and Lateral Impact Injury

Introduction

Treatment of nasal fractures was first recorded 5000 years ago during the early pharaonic period in Ancient Egypt. The Edwin Smith papyrus described repositioning of deviated nasal bones with the fingers or elevators, the insertion of splints and the application of external dressings [1]. Just as then, nasal fractures are still very common. Isolated fractures of nasal pyramid accounts for about 40% of all facial fractures. Furthermore, fractures of the na-

sal bones are often sustained with other fractures of the facial skeleton. Delays in management can result in significant cosmetic and functional deformity that often are a cause for subsequent medico-legal action. The management of fractures of the nose is an important part of everyday ear, nose and throat (ENT) practice.

Relatively little force is required to fracture the nasal bones, as little 25 - 75 lb./in [2]. It is perhaps not surprising that young men are twice as likely to sustain a fractured nose as women. Subsequent

refracture rates of 5% have been reported [3]. The peak incidence is in the 15 - 30 year age group where assaults, contact sports and adventurous leisure activities are more common. In childhood, accidental prone toddlers frequently fracture their noses as well and these are often of a green stick nature. Compound and comminuted fractures are more common in the elderly who are prone to falls.

Nasal fractures have been classified in a number of ways, for example, by the nature of injury, the extent of deformity and the pattern of the fracture.

Nasal bone fracture is the most common occurring facial bone fracture and secondary deformity can be easily noticeable if the fracture is not appropriately treated because the nose is positioned on the center of the face and is significantly anteriorly protruded compared to other facial structures. In many cases, especially those where it is considered a minor injury, nasal bone fracture can be treated simply and within a short time through the closed reduction (CR) technique. If surgeons establish a proper surgical plan and apply appropriate surgical skills, they may obtain the best results in terms of the time and cost of the surgery and post-operative patient satisfaction.

As the CR technique has limitations compared to open reduction (OR) technique in terms of the capability for sophisticated manipulations, it is necessary to select the optimal helpful operating technique for individuals depending on their nasal fracture pattern. To achieve a reliable diagnosis and consistency of surgical results, it is important to classify nasal bone fracture systemically, and treat it appropriately by employing the proper therapeutic algorithm.

Methods

Source of data

This is a retrospective and prospective study done at G.G. hospital, Jamnagar, Gujarat.

Methods of collection of data

Sample size: A minimum of 60 patients were proposed for the study depending upon the incidence.

Method: Data was collected from hospital case records and from outpatient case papers at G.G. hospital, Jamnagar. Data was collected with regular follow up 1 week, 1 month and 3 months after nasal bone fracture reduction. Data was analyzed for qualitative

and quantitative variables. Descriptive statistics was done to obtain frequencies and percentages.

Exclusion criteria:

- Fracture of nasal bone with other facial bone fracture.
- Fracture nasal bone patients with positive head injury.
- Fracture nasal bone patients who presented after 21 days of trauma or injury not included as these patients require septorhinoplasty for deformity correction.
- Open fracture of nasal bone with or without other structure involvement.

Results

In our study, most common involved patients were males (73%) because they were more likely to be involved in sports and road traffic accident (Table 1). In our study, most common age group presenting with nasal bone fractures was found to be 21 year to 30 year age group. The least common age groups were children below 10 year and those above 50 years (Table 2).

	No of patients (60)	Percentage
Male	44	73%
Female	16	27%

Table 1: Gender distribution in nasal bone fracture.

Age	No of patients (60)	Percentage
0-10	2	3%
11-20	16	27%
21-30	19	32%
31-40	14	23%
41-50	8	13%
51-60	0	0%
61-70	1	2%
71-80	0	0%

Table 2: Age distribution in patients of nasal bone fracture.

In our study, the most common cause of nasal bone fracture was road traffic accident (59%) and less common cause of nasal bone fracture was assault (Table 3). X-ray of the nasal bones was the most common done radiological investigation (60%) to confirm

diagnosis in suspected cases. CT scan was done to rule out other facial bone fractures (Table 4).

Causes of nasal bone fracture	No of patients	Percentage
Road traffic accident	35	59%
Sports injury	14	23%
Assaulted trauma	11	18%

Table 3: Causes of nasal bone fractures.

	No of patients	Percentage
CT scan	14	23%
X-ray	36	60%
CT scan+ X-ray	10	17%

Table 4: Diagnosis by radiological investigation.

In this study, fracture bone reduction was done under local anesthesia or sedation in 87% of patients and general anesthesia in 13% of patients who were children or not co-operative under local anesthesia or not willing to have reduction under local anesthesia. Most patients had lateral impact injury (70%) while few had frontal impact injury (Table 5 and figure 1).

Types of impact	No of patients	Percentage
Lateral impact	42	70%
Frontal impact	18	30%

Table 5: Impact of the injury in nasal bone fracture patients.

In our study, 77% patients of nasal bone fracture were treated by closed reduction (Figure 2) and patients with linear non displaced nasal bone fracture received medication with good outcome (Table 6 and 7).

Discussion

The retrospective study of closed reduction of nasal bone fracture by Han-kyul Park, Jae-Yeol Lee, Jea-Min Song, and Sang- Hun Shin at Pusan national university concluded that patient s in their 20s, particularly male patients, account for highest proportion [4]. This result was similar to the study conducted by Small [5], which

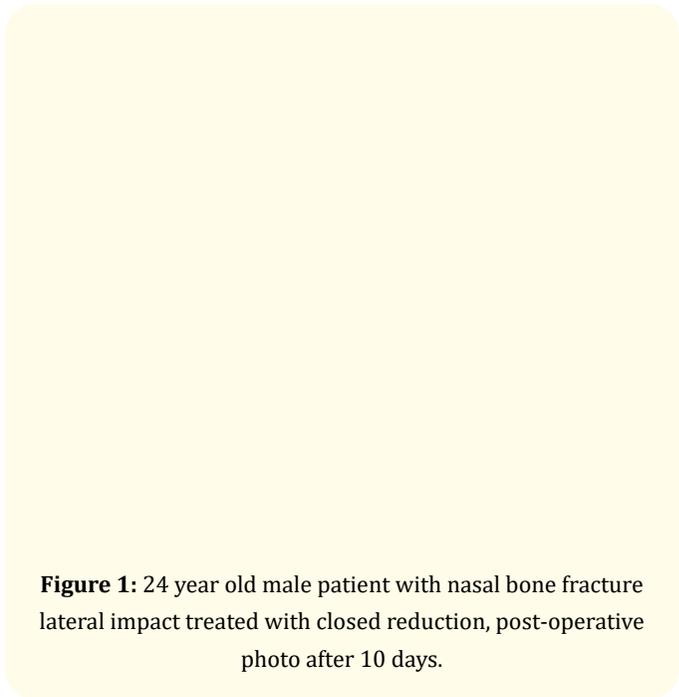


Figure 1: 24 year old male patient with nasal bone fracture lateral impact treated with closed reduction, post-operative photo after 10 days.



Figure 2: 26 year old male patient with accidental nasal bone fracture frontal impact treated with closed reduction post-operative photo after 7 days.

reported a male female ratio 4:1. In a six year study of 503 patients with nasal bone fractures, assaults accounted for 38%, falls 31%, and accidents during exercise accounted for 17% of nasal bone

Treatment	No of patients	Percentage
Closed nasal bone fracture reduction	46	77%
Medical treatment or conservative treatment	14	23%

Table 6: Treatment given.

Closed reduction under	No of patients (46)	Percentage n = 46
General anesthesia	6	13%
Local anesthesia	40	87%

Table 7: Closed reduction under anesthesia.

fractures [6]. Turvey reported that traffic accidents accounted for the highest proportion of causes of fracture [7].

In the study by Han Kyun Park., *et al.* [4] males were more affected about 85% with nasal bone fractures than the females, slips and falls were the most common cause of nasal bone fracture. Most common age group was 20 years to 29 years.

Unlike other fractures, nasal x-ray are not required to make the diagnosis or aid subsequent reduction. In a prospective study undertaken by Logan., *et al.* [6], it was concluded that x-rays were not cost effective. Their only possible utility is proof of injury in subsequent litigations. If there is clinical evidence of more serious facial injuries, CT scan should be done [7].

In the study of nasal fracture reduction: local versus general anesthesia reported that a satisfactory result was obtained in terms of stability or complications in reduction under sedation [8]. Khwaja., *et al.* [9] conducted a study on the effectiveness of reduction under sedation, but Cook., *et al.* [10] reported that a successful closed reduction could be achieved under general anesthesia.

Conclusion

The incidence of nasal bone fractures was found to be more in males due to their involvement in sports and adventures and those in the 11 to 30 year age group. Clinical presentation and x-rays of the nasal bone were found to be useful tools in the management of nasal bone fractures. Nasal fractures can be treated with good out-

comes in the majority of patients with closed reduction. If proper treatment is not given in timely interval, nasal bone fracture may cause functional and aesthetic deformity.

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