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Original Article

Ear, Nose and Throat Section

Post-Operative Outcome of Closed Reduction of Fracture Nasal Bone

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ABSTRACT

Introduction: Nose is the central part of face with special aesthetic value. It is commonly fractured in facial trauma. Most of the fractures are corrected by closed reduction.

Aim: To assess the patient's satisfaction following closed reduction of fracture nasal bone both in aesthetic and functional values.

Materials and Methods: Retrospective chart review of patients with fracture nasal bone presenting to Manipal Teaching Hospital between 2012 October to 2015 March was performed. Manipulation was carried out with instrumentation under general anesthesia. Patients who had come for regular follow-up for at least two months were enrolled in the study. Their functional and aesthetic outcomes were assessed.

Results: Out of 64 patients analyzed, 54 patients were satisfied in terms of facial aesthetics and 60 patients were satisfied with the functional outcome of the surgery.

Conclusion: Patients treated with closed reduction of fracture nasal bone had moderate levels of aesthetic and high levels of functional satisfaction.

Keywords: Nasal bone fracture, Results, Surgery

INTRODUCTION

Nose is most vulnerable to facial trauma as it is the central and most protruded part of the face. Nasal bone fracture is the most common fracture of nasal bone and accounts for greater than 50% of all facial fractures in adults [1, 2]. Although fracture of nasal bones is very common, it is often ignored by the patient unless there are symptoms of nasal obstruction and external deformity.

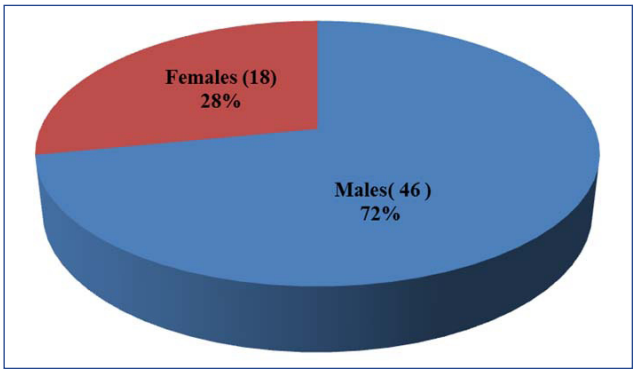
Fractures involving the nasal bones can be divided into three broad categories.

Class I fractures: They are the depressed fracture of nasal bones. Class II fractures: They are more severe forms of fracture nasal bone either from frontal or lateral impact and Class III fractures: They are the most severe nasal injuries caused by high velocity trauma. These are also known as naso-orbital or naso-ethmoidal fracture. In these fractures, the nasal bone along with the buttressing fronto-nasal process of maxilla fractures and telescopes into the ethmoidal labyrinth. Although class I and class II fractures can be treated by closed reduction, most of the class III fractures require open reduction of the fracture and use of screws and plates [3].

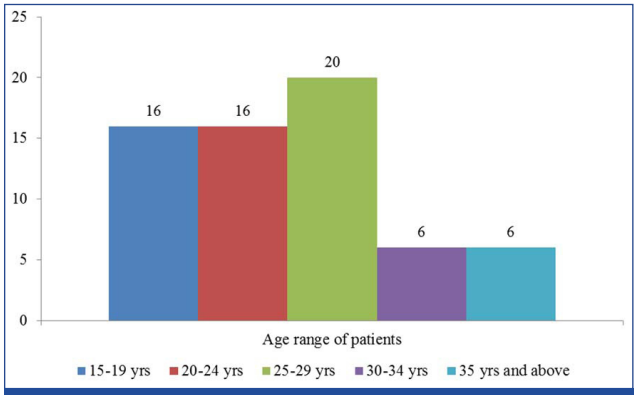
Standard practice of treatment for a nasal bone fracture is closed reduction which is conventionally performed within 7-10 days post trauma. As people now a days are more concerned regarding the aesthetic outcome of closed reduction of fracture nasal bone, this study is carried out to observe their satisfaction post-operatively. This is the first study of its kind, to be performed from western Nepal.

AIM

To evaluate the outcome of closed reduction of fracture nasal bone in aesthetic and functional aspects of patients.



[Table/Fig-1]: Pie chart of patients under study according to sex



[Table/Fig-2]: Age range of patients under study

Causes of Nasal bone fracture	Number
Road Traffic Accident	38
Physical assault	14
Fall from height/ on ground	8
Sports	4
Total	64

[Table/Fig-3]: Causes of nasal bone fracture

Myeres grading	Functional status		
	Pre op	Post op	
Excellent	0	20	p < 0.0001
Very good	0	26	
Good	16	8	
Average	22	6	
Poor	26	4	
Total	64	64	

[Table/Fig-4]: Pre and post-operative outcome in terms of nasal patency

Myeres grading	Aesthetic status		
	Pre op	Post op	
Excellent	0	14	p < 0.0001
Very good	0	24	
Good	0	8	
Average	6	8	
Poor	58	10	
Total	64	64	

[Table/Fig-5]: Pre and post-operative outcome in terms of facial aesthetics

MATERIALS AND METHODS

This is the retrospective chart review study from 1st October 2012 to 31st March 2015 (Two and a half years) in Manipal College of Medical Sciences, Pokhara, Nepal. All the patients above 15 years of age with diagnosis of fracture nasal bone class I and II who presented within 7 days of trauma and associated with external nasal deformity and/ or nasal obstruction were included in the study. Patients on regular follow up for at least two months from time of surgery were finally included for the analysis. Patients who needed open reduction or revision surgery and class III nasal fractures were excluded from the study.

Plain X-ray of soft tissue nasal bone lateral view was the base line investigation for all the patients. When the patients also had suspicion of head injury, CT scan of Head and CT PNS were also done as advanced investigative modalities.

All the patients underwent closed reduction of fracture nasal bone with instrumentation under general anesthesia. Conventional nasal packing with soframycin impregnated ribbon gauze was performed to stabilize the nose and reduce bleeding. The pack was removed after 72 hrs. The external nose was splinted with plaster of Paris (4"and10 fold) for 7 days to avoid the displacement of nasal bones. Approximate time taken for the recovery was 2 weeks.

Follow-up was done after 2 weeks of discharge and then every monthly for at least 2 more months.

Total patients enrolled in the study were 88. Out of them, only 64 patients could meet the inclusion criteria and were taken for the analysis. Patients with class I fracture were 27 in numbers whereas 37 patients were of class II fracture.

They were interviewed regarding their satisfaction in terms of aesthetic and functional outcome. Data were analysed with the help of SPSS7 and results were interpreted. Statistical tests including chi-square and Fisher exact tests were used for statistical analysis wherever indicated.

RESULTS

Sixty-four of our patients could meet the proper inclusion criteria with response rate of 72.7%. Males were 46 in numbers and females were 18 in numbers with male to female ratio of 2.55:1. Age of the patients ranged from15 to 46 yrs with mean age of presentation at 24.53 yrs. Patient characters according to sex and age range of patients under study are presented in [Table/Fig-1,2] respectively.

Road traffic accident was the major cause of nasal bone fracture in our patients followed by physical assault, fall injuries and sports injury. [Table/Fig-3] outlines the causes of fracture nasal bone. All of the patients presented to hospital within half an hour of injury to 4 days after trauma. Most common symptoms at presentation were external nasal deformity, bleeding from nose, nasal obstruction, laceration and cut injury and pain in the nose. All of the patients under study were concerned regarding their facial aesthetics at the time of presentation. None of the patients were satisfied regarding

the status of their external nose at the time of presentation whereas 48 (75%) of patients had nasal obstruction during the time of presentation to hospital. Post-operative satisfaction was compared to pre-operative status both for nasal patency and for facial aesthetics. Pre and post-operative patient satisfaction in terms of functional outcome of surgery (nasal patency) and aesthetic outcome (facial cosmetics) are represented in [Tables/Fig-4,5] respectively. Postoperatively there was significant improvement both for nasal patency and facial aesthetics with the p value of < 0.0001. However, four patients had continued nasal obstruction and ten patients had continued dissatisfaction regarding external nasal deformity.

DISCUSSION

Nasal bone is the most common bone to be fractured in facial trauma because of its natural projection and fragility of the distal structures [4]. Road traffic accident is the main etiology of fracture nasal bone followed by sports injuries and physical assaults [5-7]. Our study also showed the similar results. A recent study conducted by Sharma S. et al., [8].reported that there was male predominance for fracture nasal bone (males 72% and females 28%). The mean age of presentation was 26.2 years in their study. Fornazieri M A et al., [9] reported that fracture of nasal bone was common in males than females and the common age group was between 20 and 39 years. In our study, male population accounted for 71.8% of total and mean age at presentation was 24.5 yrs, which is almost similar to their study.

Radiological investigation plays an important role in the diagnosis and evaluation of nasal bone fractures. Most nasal bone fractures can be diagnosed with plain X-ray or computed tomography and radiography is also required for accurate treatment and post-operative evaluation [10].

There are different modalities of reduction of fracture nasal bones starting from simple manipulation to open reduction and rhinoplasty. Closed reduction of fractured nasal bone can be performed by elevation of depressed bones or depression of elevated bones to restore the symmetry of the nasal aperture.

Closed reduction of nasal bone has a satisfaction rate of 60 to 90% in different studies [6,7,11]. Murray and Maran [12] had carried out a study on the satisfaction of closed reduction of nasal bones with probably largest number of patients (n=756) in the literature. In their study, fifty-nine percent of patients were satisfied and forty one percent were not satisfied. This study is relatively old, and there have been great advancements in technology in recent years with better outcomes. Overall dissatisfaction rate has been brought down to around fifteen percent in recent literature. Recently, Love RL [13] achieved functional satisfaction in 88% of patients and aesthetic satisfaction in 86% of patients after closed reduction of fracture nasal bones. The results of this study are also similar to our study. Similarly, a study performed by Hung T. et al., [14] reported a significant improvement in the nasal deformity, nasal aesthetic, and nasal airway in patients with fracture nasal bone who underwent a closed reduction. However, 29% of their patients were not satisfied with closed reduction technique.

Highest rate of patient satisfaction was obtained in a study carried out by Vilela F et al., [15]. They have reported more than 95% patient satisfaction which is probably the first study to report such an outcome. These patients were willing to undergo the revision surgery if necessary.

However, there are few problems with only closed reduction of nasal fractures and the treatment has to be tailored according to the severity of nasal bone fracture. Therefore, a fractured nose has to be treated in different manners like closed reduction, septoplasty, osteotomies, and camouflaging cartilage grafts as and when deemed necessary [16]. The ultimate aim of all these procedures to the nose has to be for the straight septum.

LIMITATIONS OF THE STUDY

Our study is not free from the limitations. Retrospective study, small sample size and single institution involvement are the factors leading to the limitations. A prospective study of longer duration will provide the true scenario of outcome of closed reduction of nasal bone fractures.

CONCLUSION

Functional and aesthetic outcomes of closed reduction of adult nasal bone fractures using instrumentation under general anesthesia are highly satisfactory in our set up instead of the difficulties.

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