

CASE REPORT

Analysis of Simple Nasal Bone Fracture and Interpreting Results of Closed Reduction under Local Anesthesia

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ABSTRACT

Objective: To analyze the age, gender and the most frequent causes of nasal fractures evaluated in the otorhinolaryngology service of a tertiary hospital and interpreting the result of closed reduction of nasal bone fracture under local anesthesia and need for revision surgery.

Study design: Prospective case study.

Materials and methods: The prospective analysis of 60 patients diagnosed as simple nasal bone fracture over a period of 6 months (between Jan 1st 2011 and July 1st 2011) who presented in department of ENT and HNS at Government Medical College, Srinagar. All the patient underwent closed fracture reduction under local anesthesia after proper assessment and documentation. The patients were analyzed in groups and followed up to period of 6 months.

Results: Total of 60 patients (group A) with nasal bones fracture were included in the study, including 48 men and 12 women. The most common age was between 25 and 65 years. Violence was the most frequent cause seen (48%), followed by traffic accidents (35%), 12% of cases were due to sports injury other causes about 5% (fall from their own height and work related injury). After performing closed reduction under local anesthesia, the immediate results were analyzed using linear analog scale. The follow-up period ranged from 1 week to 6 months. The functional and esthetic outcome of procedure were seen in follow-up period. Patients in group A1 (80%) were pleased with their results and did not require a secondary surgery 20%. Patients developed a post-traumatic nasal deformity requiring a post-traumatic septorhinoplasty (group A2).

Keywords: Nasal bone fracture, Local anesthesia, Close reduction, Septorhinoplasty.

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INTRODUCTION

The nose is the central and dominant feature of the face and forms an important esthetic unit. The nasal bone is the most commonly fractured facial bone treated primarily by otolaryngologists. The force required to fracture the nose is less than that for any other facial bone.¹ With fractured nasal bone there is a loss of structural integrity, unfavorable changes in nasal appearance and function may occur, therefore the managing physician should render appropriate and timely treatment based on the nature and extent of the injury. Most clinical classifications are based on the degree and direction of force and are characterized as frontal or lateral injuries of varying degrees.^{2,3} Primary closed reduction is the mainstay of treatment for nasal fracture, although unacceptable functional and esthetic results have been reported.^{3,4} Poor results stem specifically from the failure to recognize septal fracture⁷ and the limited mobility of the nasal bones within the skin envelope.⁴ This is generally compounded by lack of technical expertise and limited resources.

MATERIALS AND METHODS

The study was conducted in 60 patients diagnosed as simple nasal fracture (between Jan 1st 2011 and July 1st 2011) and were evaluated in our emergency department of otolaryngology head and neck surgery. The age, sex, etiology, associated injury, findings, complications and radiographic evaluation were reviewed. A history of previous nasal injury, deformity and obstruction was recorded. The nasal bones were examined for the presence of deformity, which was recorded using the grading system devised by Murray and Maran:³

- 1: <1/2 width of nasal bridge deviation.
- 2: Between 1/2 width of nasal bridge deviation to one full width.
- 3: Deviation greater than one full width of the nasal bridge.
- 4: Almost touching the cheek.



The septum was examined and the presence of deformity recorded. A scoring system was devised to record the extent of septal deformity as follows:

0: straight, 1: minimal deviation, 2: moderate deviation, 3: obstructing nasal cavity.

All of the cases were done under local anesthesia as day care procedure. A subcutaneous injection of up to 2 ml of 1:2 lakh adrenaline: xylocaine was made down both sides of the nose, at bony cartilagenous in order to anesthetise both external nasal nerves. After adequacy of anesthesia had been confirmed, closed reduction of the nasal bones was performed with forceps and elevators and with digital manipulation, anterior nasal packing was done with gauze pack kept under nasal bone (roof pack). All the patients were put on regular follow-up and gauze pack removed on 3rd day. They were scheduled for review 2 weeks later.

The patients reassessed their nasal shape, following the procedure, before discharge by inspection and palpation and recorded their satisfaction using a linear analog scale from 0 to 10. A score of 0 indicated no improvement in nasal appearance. A score of 10 indicated the nasal appearance was the same as it was prior to fracture. The patients also recorded their pain score post each procedure using a similar scale from 0 to 10. A score of 0 represented no pain and 10 the worst pain. The surgeon noted his assessment of the fracture reduction (no improvement/partial reduction/complete reduction).^{4,5}

Exclusion criteria are as follows:

- Under 15 years old.
- Patients with associated facial trauma.
- Patients who preferred the opposite option.
- Patients who failed to return to follow-up postreduction.

The nose was examined for any persistent structural abnormality and the patients were listed for further surgery, if it was clinically appropriate; i.e. septoplasty for symptomatic nasal obstruction or septorhinoplasty for persistent nasal deformity.

RESULTS

The study group was divided into two, group A1 of 48 patients (80%) who underwent closed reduction of nasal bones and septum within 2 weeks of initial injury, 12 patients of A2 group (20%) were considered for revision surgery under GA for septorhinoplasty or fracture reduction under general anesthesia as both patient satisfaction and surgeon satisfaction score both immediate and late was low. All group A1 patients were then followed to determine overall efficacy of the initial treatment modality. Table 1 shows age distribution of patients, Table 2 shows type of trauma which caused fracture of nasal bone and Table 3 shows various prognostic factors in nasal bone fractures.

Statistical Method

Univariate and multivariate analysis of all potential factors was carried out on the study group. The following factors were analyzed as potential contributors to persistent nasal bone deformity: gender; age; operating surgeon; number of previous nasal fractures; degree of nasal bony and septal deviation; two sample t-test was carried out for each of the possible prognostic factors. Using a logistic regression model, 60 patients' data were analyzed. The prognostic factors that lead to a propensity to persistent nasal deformity are the degree of septal displacement (p=0.01). Age, gender, a history of previous nasal fractures, cause of fracture are not significant factors.

DISCUSSION

Isolated fractures of nasal pyramid and nasal fractures in association with other facial skeletal trauma are commonly seen in our setup mostly due to local violences and road traffic accidents. Here, we have considered only isolated nasal bone fractures. The mean age of our patients was 35 years. It is not surprising to see the result that young men significantly receive nasal bone injuries as compared to women and elderly men as they are more involved in violence, rash motor cycle driving and in sports activities. In our study group, 86% patients presented mostly in evening hours on all working days and were due to violence between family members and with neighbours, the sports related injury show a sudden peaks on sundays. In elderly patients, the common cause of injury seen was due to fall on ground.

Table 1: Age distribution

15-25	11
25-35	27
35-45	16
45-55	6

Table 2: Type of trauma which caused fracture of nasal bone

Causes of trauma	Age	Men	Women
Violence	48% (29)	74% (21)	26% (8)
Traffic accidents (motor cycle)	35% (21)	71.5% (15)	28.5% (6)
Sports injury	12% (7)	100% (7)	0
Other causes (fall/work related)	5% (3)	66.5% (2)	33.5% (1)

Table 3: Prognostic factors in nasal bone fractures

Prognostic factor	p-value	Statistical significance
Gender	0.15	Insignificant (p > 0.05)
Age	0.85	Insignificant (p > 0.05)
Previous fracture	0.068	Insignificant (p > 0.05)
Septal fracture	0.01	Significant (p < 0.05)
Timing of fracture reduction	0.03	Significant (p < 0.05)

The patients presented with history of trauma followed by deviation in external nose with 56% of patients associated with epistaxis with 14% associated with nasal obstruction. The patient with trauma nose can also present with pain, watery rhinorrhea, visual disturbances, trismus, loose tooth, etc. but such patients were not considered in our study. Diagnosis of nasal fracture was done with physical examination. Any deviation, depression and step deformity was noted and nasal bone crepitus checked in all patients. For classification of fractures extend of lateral deviation of nasal pyramid was seen and graded accordingly as grade 0 to 4. Diagnosis was confirmed in all cases with radiographic evaluation (lateral nasal bone radiograph) for medicolegal reasons.⁶ The need for radiograph is controversial and in many places it is actively discouraged, Logan et al also concluded that they are not cost-effective only utility is proof of fracture in subsequent litigation.

The management of all the patients was done with closed reduction of nasal bone fracture under local anesthesia⁷ with (1:200,000 adrenaline:xylocaine solution). The closed reduction was done on first visit in 78% of patients and other patients who had soft tissue edema on first presentation were considered with 10 days after edema subsides.

Closed reduction of nasal fractures appears to be an effective method of treatment as long as careful attention is paid to the key regions in the nasal complex, including the septum at the initial time of treatment. Ideal results are obtained, when surgery is performed within 2 weeks of initial injury.^{2,3} Factors, such as timing of surgery, the status of the nasal septum,⁷ delay in surgical reduction, pre-existing nasal deformity, postoperative trauma scarring and fibrosis, and other associated injuries may influence the overall result.

In this series of patients, the outcome scores at outpatient review tended to be lower than those recorded immediately after the procedure. This may be due to the infiltrated local anesthetic obscuring the assessment of fracture reduction. It is, however, more likely that the nasal bones moved in the interval between fracture reduction and outpatient review. This could be due to further minor trauma or drift of the nasal bones back toward their prereluction position.⁸ Whatever the reason may be, these results suggest there is a group of patients who have a successful reduction initially, but when reviewed a couple of weeks later are found to have persistent cosmetic deformities. This emphasizes the importance of reviewing patients after reduction of nasal fractures, and not, as is commonly practised, discharging them without follow-up.

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