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## Nasal bone fractures in children- A clinical study

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### Abstract

**Background:** Nasal bone fractures are quite common nowadays. An average 1/3<sup>rd</sup> of all nasal fractures occur in the pediatric population. It is 2nd most common site of injury in children. It constitutes approximately 41% and 60% of all pediatric facial fractures [1] the present study was conducted to evaluate cases of nasal fractures in children.

**Materials & Methods:** This study was conducted in the department of orthopaedics in year 2014. It included 48 patients with nasal bone fracture. Patient's parents were informed regarding the study and written consent was obtained. Common reasons, type of nasal fractures and satisfaction level of patients were recorded.

**Results:** Out of 48 patients, 22 were males and 26 were females. The difference was non - significant ( $P>0.05$ ). Common reason for fracture was fall down in males (10) and females (12), football trauma in males (7) and females (9), road traffic accident in males (3) and females (2) and fight in males (2) and females (3). The difference was non - significant ( $P>0.05$ ). Fractures were depressed in males (14) and females (12), comminuted in males (1) and females (2), greenstick in males (3) and females (9). In 4 males and 3 females, radiographs were not done. The difference was non - significant ( $P>0.05$ ). Common symptoms in patients were nasal deformity and nasal obstruction. 9 patients, 11 patients and 20 patients were satisfied who presented in 1-3 days of trauma, 4-7 days and >7 days of trauma respectively. 2 patients, 3 patients and 4 patients of nasal obstruction were satisfied presented in 1-3 days of trauma, 4-7 days and >7 days of trauma respectively. The difference was non- significant ( $P>0.05$ ).

**Conclusion:** Nasal bone fractures in children are becoming common nowadays. Fall and sports injury are common factors in children leading to fracture. Road traffic accidents are other causes.

**Keywords:** Nasal, greenstick, comminuted

### 1. Introduction

Nasal bone fractures are quite common nowadays. An average 1/3<sup>rd</sup> of all nasal fractures occur in the pediatric population. It is 2nd most common site of injury in children. It constitutes approximately 41% and 60% of all pediatric facial fractures [1]. Facial fractures involving children are much more common in males than females. It has been estimated that boys account for 63 to 76% of facial fractures. Motor vehicle accidents, sports, violence, falls, and other accidents are among common causes of fractures. Intrauterine and birth trauma are infrequent causes of injury to the external nose and/or septum requiring acute management, yet may be the occult origin of internal or external deviations presenting years later in a patient with no identifiable inciting traumatic event [2].

The most common locations of injury to the nose are the nasal tip, dorsum, and nasal root region, and 32% of injuries involve the nasal skeleton. The long-term surgical outcome of a nasal bone fracture in a pediatric population is important because of the growing characteristics, whereby even a minor trauma could cause a major deformity as the patient becomes older. Pediatric nasal bone fractures should be reduced earlier than adult fractures, within 3-7 days [3].

In children, the nasal framework is more cartilaginous than bony and has less frontal projection. In younger children, the nasal bones are separated in the midline by an open suture line, and laterally the nasal bones overlap the frontal processes of the maxilla. As the nose and midface grow, these structures take on the more familiar adult anatomy [4]. The majority of nasal growth occurs in two distinct postnatal growth spurts, ages 2 to 5 years and again during puberty. Growth is usually completed by age 16 to 18 girls and 18 to 20 in boys,

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although additional growth of the nasal septum may occur up to the age of 25 years. Between these two rapid growth phases, there is a period of moderate nasal growth. An understanding of growth periods has led many surgeons to delay rhinoplasty surgery until after the adolescent nasal growth phase [5].

The present study was conducted to evaluate cases of nasal fractures in children.

**2. Materials & Methods**

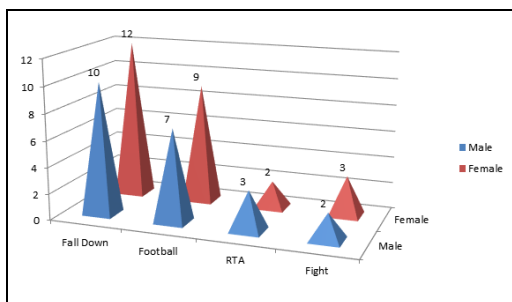
This study was conducted in the department of orthopaedics in year 2014. It included 48 patients with nasal bone fracture. Patient’s parents were informed regarding the study and written consent was obtained. General information such as name, age, gender etc was recorded. Common reasons, type of nasal fractures and satisfaction level of patients were recorded.

Results thus obtained were subjected to chi square test. P value < 0.05 was considered significant.

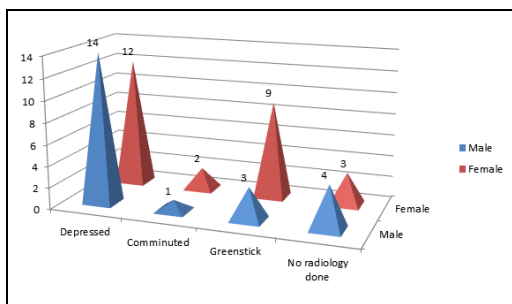
**3. Results**

Table I shows that out of 48 patients, 22 were males and 26 were females. The difference was non - significant (P>0.05). Graph I shows that common reason for fracture was fall down in males (10) and females (12), football trauma in males (7) and females (9), road traffic accident in males (3) and females (2) and fight in males (2) and females (3). The difference was non – significant (P>0.05). Graph II shows that fractures were depressed in males (14) and females (12), comminuted in males (1) and females (2), greenstick in males (3) and females (9). In 4 males and 3 females, radiographs were not done. The difference was non – significant (P>0.05).

Table II shows that common symptoms in patients. It included nasal deformity and nasal obstruction. 9 patients, 11 patients and 20 patients were satisfied who presented in 1-3 days of trauma, 4-7 days and >7 days of trauma respectively. 2 patients, 3 patients and 4 patients of nasal obstruction were satisfied presented in 1-3 days of trauma, 4-7 days and >7 days of trauma respectively. The difference was non-significant (P>0.05).



**Graph 1:** Type of trauma causing nasal fracture



**Graph 2:** Type of nasal bone fracture

**Table 1:** Distribution of patients

Total - 48		
Male	Female	P value
22	26	0.2

**Table 2:** Long term satisfaction survey of pediatric patient with nasal bone fracture based on time of surgery

Variable	1-3 days (n- 10)	4-7 days (n-13)	7 days (n- 25)
Nasal deformity			
Yes	8	10	23
No	2	3	2
Satisfaction			
Yes	9	11	20
No	1	2	5
Nasal obstruction			
Yes	2	3	5
No	8	10	20
Satisfaction			
Yes	2	3	4
No	0	0	1

**4. Discussion**

In very young children, nasal fractures are not common because of the underdeveloped nasal bones and the relative projection of the soft part of the nose with compliant cartilage, which easily bends during trauma. Low quality radiography and difficulty in taking computer Tomography (CT) scan at this age is also a contribution factor. In adolescence, a nasal bone fracture pattern more closely follows that of adults [6]. The present study was conducted to evaluate cases of nasal fractures in children.

In our study, out of 48 patients, 22 were males and 26 were females. We found that common reason for fracture was fall down, football trauma, road traffic accident. This is in agreement with Varwoed *et al* [7]. We found that most of the fractures were depressed followed by greenstick and comminuted. Our results are in agreement with Parkin SW *et al* [8].

According to Moran [9], the most commonly seen pattern is the lateral fracture, in which an in-fracture is noted on the side of the traumatized nasal bone at the point where the ascending process of the maxilla and the nasal bone meet, and an out-fracture is seen in the opposite nasal bone.

We found that most of the patients had nasal deformity as major symptoms while few had nasal bone obstruction. A study conducted by Wheeler [10] found that 72% of patients had nasal deformity led to unesthetic appearance of face. Similarly in our study, 85% of pediatric patients had nasal deformity.

Rocchi *et al* [11] observed that the most frequent facial trauma cause in the age range from 11 to 19 was the motorcycle accident (41%). The motorcycle accident is an important facial trauma cause, mainly due to the current use of helmet without protection of the face. Within the motorcycle accidents, the nasal bone is one of the most fractured, in addition to the orbit and maxilla.

**5. Conclusion**

Nasal bone fractures in children are becoming common nowadays. Fall and sports injury are common factors in children leading to fracture. Road traffic accidents are other causes.

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