ORIGINAL REPORT

Comparison of the Frequency of Old Septal Deviation in Patients with and without Traumatic Nasal Bone Fracture

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Abstract- Investigating the frequency of traumatic nasal bone fracture in patients with and without old septal deviation and possible deviation. Prospective study of 105 patients with nose trauma conducted and cases were divided into two groups: a study group 35 patients with nasal fracture and a control group of 70 patients without nasal fracture. Diagnosis of septal condition was made by anterior rhinos copy and endoscopy using manipulation of septum. 31 (89%) of the patients with nasal fracture after trauma were diagnosed with old septal deviation. In comparison, only 39 (34%) of patients in the control group were diagnosed with old septal deviation. In comparison, only 39 (54%) of patients in the control group were diagnosed with old septal deviation. Existing old septal deviation significantly increases the risk of traumatic nasal bone fracture.

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Key words: Fracture bone; nose; nasal septum; injuries

Introduction

The Nasal septum is a support structure of the nose and has an important role in the nasal physiology (1). The nasal septum during embryogenesis grows and pulls the developing osteogenic centers of both maxillae and acting as the impetus for growth of the midface (2). There is no standard definition of septal deviation, but it usually refers to convexities of the septum to one side with accompanying deformities of midline structure. Septal deviation is the most commonly seen deformity of the nose, which can be either congenital or acquired. The reported incidence is as 40% in a study conducted by computerized tomography (1). Septal deviation can be assessed both clinically and radiologically (3), although, in the some countries, the selection for septal surgery is based purely on subjective assessment and this may cause patient dissatisfaction (4). Severe septal deviation seems to play a contributory role in the pathogenesis of chronic rhinosinositis (4-6). Septal Dislocation occurs in about 17 percent of deliveries (7). This can be due to compression of the nose from the maternal symphysis pubis or sacral promontory during labor and delivery but this frequency is not different in caesarean section and spontaneous delivery (7). Nose fracture is the most common fracture occurring on the face (8-10). Due to the prominence structure of the nose, it is very likely to be harmed (8). It is uncommon occurrences in children younger than five years of age (11). Sport-induced, fall and assault are the usual causes implicated in most nasal fractures. Males are affected approximately twice as often as females, with a peak incidence in the second and third decades of life (12). Previous studies have shown that most nasal fractures involve the septum, which can provide an obstacle to the successful reduction of nasal bone fractures (10,13). Among the signs evident at physical examination, muscosal tearing was found to be statistically significant for septal fracture. Computed tomography was found to be very helpful in diagnosing septal fracture but could not predict its severity accurately (10). The aim of this prospective study was to investigate the frequency of old septal deviation in patients with traumatic nasal bone fracture in comparison with patients without fractures but with the same severity of impact trauma.

Patients and Methods

Prospective study about patients with nose Trauma was conducted in the besat Hospital, university of Hamedan, Iran. This study was carried out with the approval of the medical research ethics committee of the Hamadan

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University of Medical Sciences and informed consent was obtained from all patients. In the duration of 2004, we studied two Groups of patients: a study group of 35 patients which had nasal bone fracture after trauma (11 women and 24 men) between 5 to 55 years old and a control group of 70 patients without fracture after trauma (21 women and 49 men) between 6 to 71 years old.

Diagnosis for nasal Bone fracture According to clinical signs (especially) and radiography of nasal bone was documented.

All patients had no other facial fractures or history of nasal surgery, therefore no other exclusion criteria was mentioned. All cases were evaluated for old septal deviation by nasal endoscopy. A precise inspection on position and condition of all of the segments of the septum was done. This effort was made by a thorough inspection and manipulation of septum in terms of swelling, tenderness, deviation, mucosal tearing and mobility of septum. Using a cotton-tip applicator, the septum was touched and examined for detection of mobility and condition. If the septum was moving means new fracture, and if it was fixed means old septal deviation. The age, sex and pattern of trauma were similar for both groups however; cases with extensive nasal fracture were excluded. Of course the direction of blow was important for us and it was recorded for all patients.

Data analyses were done using T test with SPSS software, $P<0.05$ was considered significant.

Results

In this study35 patients with nasal bone fracture and 70 patients (Control) without fracture (Two groups after nasal trauma) were evaluated, and the following results were obtained: 69% of patients with fracture and 70% without fracture were men ($P = 0.373$).

The age distribution of patients with fracture was 5-55 years (mean= 26.5 ± 12) and the most prevalent was between 16-45 years. The range of age of patients without fracture was 6-71 years (Mean= 30 ± 14) and the most prevalent was between 14-38 years (P= 0.27).comparison of two group statistically was not significant for age (P=0.27) and sex (P=0.373).

According to our results 89% of the patients with fracture after trauma had septal deviation which diagnosed by nasal examination and endoscopy, and only 11% of these patients had not old septal deviation (fig.1), but in the control group without fracture 54% had old septal Deviation and 46% had not old septal Deviation. Only, 3 cases in our study had new fracture, that by touching and feeling of its mobility has been documented and they were considered in total patients with septal deviation. Comparison of old septal deviation between two groups were detected statistically significant (P=0.044). The most common causes of the injury were violence, fall-down, traffic accident especially motorcycle and sport. There was a male predominance in two groups and in the relation of causes, falling in elderly, sport for children and violence and accident for the adult were the most common causes.

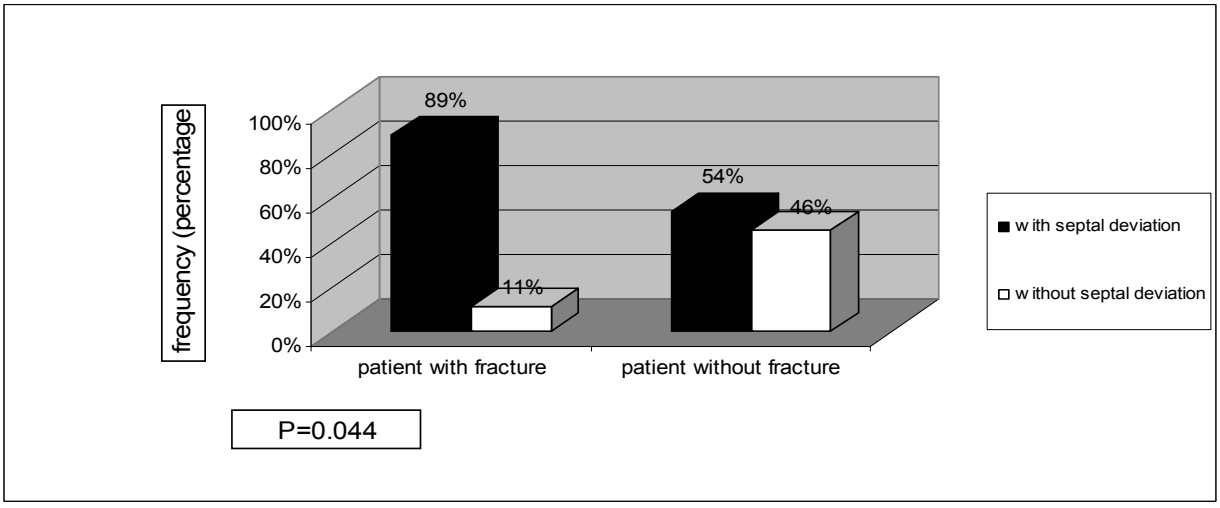

Figure 1. Comparison of septal deviation frequency in patients with and without nasal fracture

Discussion

Nasal bone fractures are the most common type of facial fractures. Interestingly, septal problems such as new septal fractures or old septal Deviation are often unrecognized and untreated at the time of injury, and this is associated with a high incidence of post traumatic nasal deformity. Murray found in a stepwise study a 30 to 40 percent failure rate in nasal operations[4] and it is well known the major cause of nasal deformity and obstruction is septal deviation (13).

In the present study of 105 patients with nasal trauma, we detected deviation of septum in patients who had nasal bone fracture was more than those had not one, so that 31 (89%) of the patients with nasal fracture after trauma had old septal deviation but in the control group without fracture 39 (54%) had old septal deviation and this result is statistically significant (P=0.044).

Physical examination findings are subjective and vulnerable to examination bias. Objective measures often do not correlate well with each other or with patients symptoms (14) but, Among the signs evident at physical examination, mucosal tearing should be mentioned as septal fracture and we found most of our patients had old septal deviation without mucosal tearing or Hemorrhage on septal surface and septal mobility that simply examined by using an applicator for touching both sides of the septum. In contrast, in nearly all previous studies on nasal fractures, high percentage of accompanying septal fracture was identified (10) and we believe most of those cases had old septal deviation and probably incorrect diagnosis have been known new septal fracture. Nasal fractures are uncommon occurrences in children younger than 5 years age (8) but the incidence is elevated with increasing age and peaks between 15-30 years. Reasons for this difference are small size of the nose (9) low Wight of child (10) excessive soft tissue on the child face that protects nose from mechanical forces and also strong connection between developing osseous of the child face and incomplete pneumatization . One of the rare sequel of nasal trauma is septal haematoma (15), interestingly there was not even one case of septal haematoma in the our all patients. Probably, the most common Type of nasal bone fracture is the lateral side due to direction of trauma from the lateral. Murray *et al*. found in a study the power of forces for lateral fractures (16-66 kilo/ Pascal) is very lower than frontal fractures (114 – 312 kilo/ Pascal) (10).

The results of present study show although the impact forces on the nose of all patients was the same but underlying septal deviation in the patients group with fracture was more common and this can be accepted for the role of septum for nose protection from trauma. The High failure rate and dissatisfaction of the patients following the reduction of nasal bone can be due to disregard to correction of the septum, although, some previous studies[10] focused on Septal fractures, but we suggest that this is a common underlying old septal deviation that causes weakness point for protection and so many cases required septoplasty accompanying reduction of nasal bone.

Of course, our study has some limitations for example, small size of the study population and signs of preclusive physical examinations of septal injury, so these results provide pilot data for a future study on this point. In conclusion, septal deviation in patients with nasal fracture following trauma is more than normal population. Therefore, probably old septal deviation is an important risk factor for nasal fracture.

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