

Olfactory Dysfunction Following Nasal Trauma

E Dursun, B Battal

Citation

E Dursun, B Battal. *Olfactory Dysfunction Following Nasal Trauma*. The Internet Journal of Otorhinolaryngology. 2008 Volume 10 Number 1.

Abstract

Purpose: This retrospective study aimed to investigate olfactory function following nasal trauma. **Materials and Methods:** Patients who had nasal trauma from January 2007 to December 2008 medical records were reviewed. Clinical files were reviewed to investigate etiology, associated injury, clinical findings, radiographic evaluation, olfactory functions, complications and improvement on olfactory functions. Olfactory function was assessed with a simple odor test. Olfactory function was re-tested 3 months after nasal trauma. **Results:** A total of 143 patients were included in this retrospective study. All patients were male. (Age range 15–45 years, mean age 23.4 years). Using a conservative definition of change of olfactory function, following nasal trauma, loss in sense of smell was found in 6.3% (n:9). Patients exhibiting a displaced nasal fracture (n:7) had higher posttraumatic olfactory disfunction than patients who experienced non-displaced (n:2) or nasal soft tissue damage (n:0). **Conclusions:** These results in a large group of patients confirm previous work. Apart from apparent success in nasal fracture reduction there is also a small but significant group of patients in whom olfactory function decreases after nasal trauma. This group should receive specific attention when counseling patients about the potential risks of nasal trauma.

INTRODUCTION

The nose is easily exposed to trauma because it is the most prominent and anterior feature of the face. Nasal fractures may occur in isolation or in association with other facial injuries. Loss of olfactory function is among the most prominent signs of nasal disease (1). There are so many patients presented to the physicians with complaints of smell disturbances after trauma which affects maxillofacial region or head. Although many patients had head trauma, relatively little research has been performed to investigate smell function after isolated nasal trauma. In this retrospective study we aimed to investigate olfactory function following nasal trauma.

MATERIALS AND METHODS

143 male patients with nasal trauma evaluated in emergency department of otolaryngology head and neck surgery between January 2007 and December 2008. The age, etiology, associated injury, clinical findings, treatment, complications and radiographic evaluation were reviewed. Patient with isolated nasal trauma was included to study. Nasal trauma followed by falls and vehicle crashes, nasal injury associated with other head and neck trauma, and pediatric patients were excluded from study. All patients were asked if they have complaint about the smell. Patients with olfactory disturbances were evaluated by using simple

odor test. All patients had plain radiograph of lateral nasal bone. All patients with posttraumatic smell loss also underwent anterior rhinoscopy to exclude obstructive or inflammatory causes of smell dysfunction. Treatment in the primary care setting consisted of evaluation, pain and infection management, minimal debridement and reduction. If an immediate referral was not indicated, close follow-up was arranged within three to five days after the injury. After three months patients with olfactory dysfunction were recalled to clinical visit that included questions about olfaction and nasal breathing.

RESULTS

A total of 143 male patients were evaluated in this retrospectived study (Age range 18–43 years, mean age 23,4 years;). The causes of nasal injury were violence (n:122), sports (n:17) and work related (n: 5). The distributions of participant characteristics by olfactory impairment are shown in Table 1. The most frequent findings were nasal deviation, nasal depression, tenderness, nasal bleeding, ecchymoses, edema, instability, crepitation and dried blood. Diagnosis of the fracture was made by plain graphy in all cases.

Figure 1

Table 1: Characteristics of Study Participants

Type of Injury	Patients	Olfactory Dysfunction	Results
Nasal Soft Tissue Injury	69	-	-
Nondisplaced Nasal Fracture	41	2	2 patients spontaneous recovery
Displaced Nasal Fracture	33	7	5 patients spontaneous recovery, 2 patients persistent smell loss

All nasal fractures were treated by closed reduction and reduction was carried out within 2 days following injury. All interventions were performed under general anesthesia. Patients were followed for a presence of nasal complications. There was no abscess formation, haematoma or saddle nose deformity. None of the patients required post traumatic septorhinoplasty.

There were 9 patients with a complaint of olfactory dysfunction after trauma (Table 1). 7 patients complained of abnormal smell sensitivity after trauma with fluctuation and localized both nostrils. In nondisplaced group two patients had complaint of smell loss. These two patients had spontaneous recovery of smell loss after 3 months. In displaced group seven two patients had complaint of complete smell loss. Five patients had spontaneous recovery within 3 months. But in two patients smell loss persisted after 3 months. The overall prevalence of olfactory dysfunction was 6.3 %, composed of 1.4 % with persistent and 4.9 % with temporary.

DISCUSSION

Nasal bone fractures are the commonest type of the bony facial injury seen in an emergency department because of the prominent position of the nose on facial skeleton. In cases of facial trauma, nasal fractures account for approximately 40 percent of bone injuries (2). Fights and sports injuries account for most nasal fractures in adults. Nasal fractures may occur in isolation or in association with other facial injuries. Management of the injury will depend on whether the fracture is nondisplaced, displaced, open, or associated with a complication that necessitates a more aggressive approach. A fractured nose can be manipulated within two weeks, that is why the early follow-up is essential. Diagnosis of nasal fractures is based on the physical examination and radiographic evaluation. Simple radiograph of lateral nasal bone is important to show fracture and for medicolegal reasons (3).

Another complication of nasal trauma can be disturbance in sense of smell. Complete or partial loss of olfactory function may occur when the nasal passages are blocked, olfactory nerves are injured or there are contusions or hemorrhages in olfactory centers of the brain (4). The incidence of posttraumatic anosmia depending from the severity of the injury lies between 5% and over 80% (5). Posttraumatic anosmia occurs in approximately 31% of patients who have sustained major closed head injuries, as defined by posttraumatic amnesia for more than 24 hours. However, even in persons whose head injuries are not accompanied by loss of consciousness or in whom amnesia lasts less than 1 hour, the frequency of anosmia ranges from 3% to 8% (6,7,8). In present study, the overall prevalence of olfactory dysfunction was 6.3 %, composed of 1.4 % with persistent and 4.9 % with temporary.

Recovery of olfactory function after head trauma is variable. Most large series report a return of olfactory function in 14% to 39% of patients who were initially anosmic (6,7,9), especially if the interval of posttraumatic amnesia is less than 24 hours. While 74% of patients recovering olfactory function do so within 12 weeks, one study reported that an additional 22% will regain function by the second year after the injury (6). However, reports of return of olfactory function as long as 7 years after injury have been published, although few studies have used quantitative tests of olfactory function (6,7). Age plays a significant role in the recovery of olfactory function(10).

CONCLUSION

This study demonstrates that prevalence of olfactory impairment among nasal trauma patients is not high and increases with severity of trauma. Therefore, administration of smell tests is necessary to obtain accurate prevalence rates of smell impairment, at least in the displaced groups tested. Physicians should be alert to the potential for olfactory impairment in the nasal trauma population.

CORRESPONDENCE TO

Engin Dursun, MD Sarikamis Military Hospital, Department of Otorhinolaryngology 36500, Sarikamis, Kars, Turkey E-mail: drengindursun@yahoo.com Phone: 090 505 8667248 Fax: 090 474 4136264

References

1. Fokkens W, Lund V, Bachert C, et al. EAACI position paper on rhinosinusitis and nasal polyps executive summary. Allergy 2005;60:583–601.
2. Bartkiw TP, Pynn BR, Brown DH. Diagnosis and management of nasal fractures. Int J Trauma Nurs

1995;1:11-8.

3. Akdogan O, Selcuk A, Gurbuz D, Dere H. Analysis of simple nasal bone fracture and the effect of it on olfactory dysfunction. *KBB-Forum*.2008;7(2) www.KBB-Forum.net
4. Costanzo RM, Miwa T: Posttraumatic olfactory loss. *Adv Otorhinolaryngol* 2006;63:99- 107.
5. Delank KW, Fechner G. Pathophysiology of post-traumatic anosmia. *Laryngorhinootologie*. 1996 Mar;75(3):154-9. [Article in German]
6. Sumner D. Post-traumatic anosmia. *Brain* 1964; 87:107–120.
7. Zusho H. Posttraumatic anosmia. *Arch Otolaryngol*

1982;108: 90–92

8. Zasler ND, Costanzo RM, Heywood PG, “Neuroimaging Correlates of Olfactory Dysfunction after Traumatic Brain Injury,” *Arch Phys Med Rehabil* 1990;71:814.
9. Varney NR. Prognostic significance of anosmia in patients with closed-head trauma. *J Clin Exp Neuropsychol* 1988;10:250–254
10. Reden J, Mueller A, Mueller C, Konstantinidis I, Frasnelli J, Landis BN, Hummel T. Recovery of olfactory function following closed head injury or infections of the upper respiratory tract. *Arch Otolaryngol Head Neck Surg*. 2006 Mar;132(3):265-9.

Author Information

Engin Dursun, MD

Department of Otorhinolaryngology, Sarikamis Military Hospital

Bilal Battal, MD

Department of Radiology, Sarikamis Military Hospital