

Retrospective Analysis of Nasal Fractures in the Emergency Clinic

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Abstract

Objective: The aim of this study is to analyze the demographic and diagnostic characteristics of patients presenting to the emergency clinic with nasal trauma.

Material and Methods: Data analysis was performed with imaging tests on the files of 77 patients presented to the emergency clinic between 2012 and 2013.

Results: In order of prevalence, nasal fractures were caused by falls from heights, violence, trauma, sports injuries and traffic accidents. Physical examination findings in patients with nasal fracture were sensitivity, nose swelling, nasal mucosal hemorrhage and septal deviation. Fracture was also determined at physical examination in 26 (86.6%) of the 30 patients with fracture detected at tomography. In the analysis, approximately 26% were multiple depressed fractures, while linear fracture along a single line was determined in 31%, with fissure-type fracture in the remaining 43%. Pathologies such as septal edema or hemorrhage were present in 30 of the 77 patients, while the septum was mobile and dislocated in approximately 16 of these patients (33.7%).

Conclusion: Falls from heights were the most common cause in patients with nasal fracture, and although the most common imaging technique employed was x-ray, tomography provided more detailed information concerning rhinorrhea, smell perception disorders, maxillofacial traumas and multiple nasal fractures. (*JAEM 2014; 13: 139-42*)

Key words: Nasal fracture, septal pathology, emergency

Introduction

The nose, the uppermost part of the respiratory system, is the weakest and most protuberant region of the face. It is therefore the part most affected by both general body and facial traumas (1). Another factor facilitating trauma is that the nose protrudes in an unprotected manner from the center of the face. Septonasal traumas may lead to deformations in the form of deflexion, angulation, and luxation in the nasal septum and the cartilage and bones constituting the roof of the septum (2). The most common causes of nasal fractures are motor vehicle accidents, falls, sports injuries, and physical blows (3). Nasal fractures are generally seen together with general body trauma in emergency clinics, and since the emphasis there is on life-threatening diseases, problems may be seen early or late in the diagnosis and treatment (4).

The purpose of this study was to analyze the files and demographic and clinic-radiological characteristics of patients with nasal fracture alone or with accompanying pathologies presenting to our university emergency clinic.

Material and Methods

The files of 77 patients aged between 0 and 80 and attending our university clinic between April 2012 and May 2013 were analyzed retrospectively. Physical examination findings and imaging films were evaluated. X-rays were performed using a single-detector digital x-ray digital device (Arcoma AB, Annavagen1, SE-35246, Växjö, Sweden) and computerized tomography using a 64-detector CT device (Philips Medical Systems, Cleveland, OH, USA). Since tomography was generally performed on patients with head trauma, 2-mm sections from the nasal bone to the apex were taken in the axial, coronal, and sagittal planes. Nasal x-rays were taken laterally and front to back; x-ray findings were then compared with tomography findings. Fracture lines and changes in nasal septal structure and soft tissue were analyzed by CT.

Statistical Analysis

Statistical analysis of categorical data was performed using the Statistical Package for Social Sciences 15.0 (SPSS Inc., Chicago, IL, USA). Data were evaluated descriptive statistics for frequency analysis.

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Results

Patients' ages were in the range of 2-70±15.5; 25 were female and 52 were male (Table 1-2). In order of prevalence, nasal fractures were the result of falls from heights (n=37), violence (n=16), trauma (n=12), sports injuries (n=7), and traffic accidents (n=5) (Table 3). The patients' main examination findings were, in order, nasal swelling, pain, deformation, and nosebleed. Crepitation was present in the physical examination in 58 of the 77 patients presenting with nasal trauma, and the line of fracture was determined in all of these patients by both x-ray and tomography. Laceration was present in 18 patients and skin defect was present in 7, the skin being healthy in the other 52. Soft tissue edema was also present in 73 of the 77 patients. Radiological analysis was performed on 36 patients who underwent both tomography and x-ray imaging (Table 4). Fracture was determined in the physical examination in 26 (86.6%) of the 30 patients with fracture identified by tomography. Twenty-six percent of the fractures analyzed were multiple depressed fracture, while the fracture was linear along a single line in 31%, and a fissure-type fracture line was detected in the remaining patients (43%). Damage to the face or other organs, and particularly the brain, was also present in addition to nasal fracture in all the patients with multiple fracture. Pathologies, such as septal edema or hemorrhage, were present in 30 of the 77 patients with nasal bone fracture, although the septum was mobile or dislocated in only 16 of them (33.7%) (Table 5). Physical examination findings, in order of prevalence, were sensitivity, swelling in the exterior part of the nose, nasal mucosal hemorrhage, and septal deviation. Epistaxis was determined more in tissue loss and multiple nasal fractures. Two patients also experienced symptoms concerning smell perception.

Discussion

On the basis of these results, cranial tomography may be sufficient to diagnose nasal fractures in order to administer less ionizing radiation in nasal traumas, including head trauma, in the determination of severe nasal fracture in patients with nasal edema, pain, and deformation. In addition, tomography is vitally important in terms of the relation between soft tissue and septum injury and fracture, particularly with the skull base, in both the differential diagnosis and treatment planning.

Septonasal pathologies may lead to medical problems, such as snoring, recurring throat infections, rhinosinusitis, and mucosal contact headache, and to psychological problems by causing facial deformation. Therefore, early diagnosis and treatment of nasal fracture are very important. Nasal fracture may generally be overlooked by radiologists and ear, nose, and throat physicians (5). In fact, a missed diagnosis is not associated with this alone. In patients with complicated multiple trauma, the priority being given to other urgent factors concerning the cranium or abdomen and the postponement of pre-existing problems in emergency clinics may lead to delays in diagnosis and to functional problems due to treatment being administered late. In general terms, poor cooperation, the patient being unable to describe the previous nasal structure, and absence of crepitation and step difference specific to the fracture of the nasal bone in the physical examination may lead to the diagnosis being delayed or missed in patients with trauma. In 8 of our patients, no crepitation was detected despite fracture being determined at to-

mography. Early diagnosis can assist early treatment, reducing nasal obstructions that may develop in later periods and esthetic problems that may arise. Rohrich et al. (6) reported a history of septonasal fracture at anamnesis in a large part of patients undergoing septum surgery or septorhinoplasty. In addition, early diagnosis may be significant in reaching decisions in medicolegal cases in terms of leaving traces in the face and establishment of functional problems. In our analysis, tomography permits the physician to establish a definitive

Table 1. The age distribution of patients

	N	Minimum	Maximum	Mean	Std. Deviation
Age	77	2.00	70.00	23.7143	15.55454
Valid N (listwise)	77				

Table 2. The gender distribution of patients

Valid	Gender			
	Frequency	Percent	Valid Percent	Cumulative Percent
Female	25	32.5	32.5	32.5
Male	52	67.5	67.5	100.0
Total	77	100.0	100.0	

Table 3. The causes of nasal fractures of patients

	Gender			
	Frequency	Percent	Valid Percent	Cumulative Percent
Accident	5	6.5		
Drop	37	48.1		
Fight	16	20.8		
Sport	7	9.1		
Trauma	12	15.6		
Total		77	100.0	100.0

Table 4. The distribution of imaging of patients

Valid	Radiology	
	Frequency	Percent
CT	36	46.8
Direct graphy	41	53.2
Total	77	100.0

*CT: Computed Tomography

Table 5. The distribution of septal pathology with nasal fractures

Valid	Septal Patology	
	Frequency	Percent
.00	47	61.0
1.00	30	39.0
Total	77	100.0

*CT: Computed Tomography

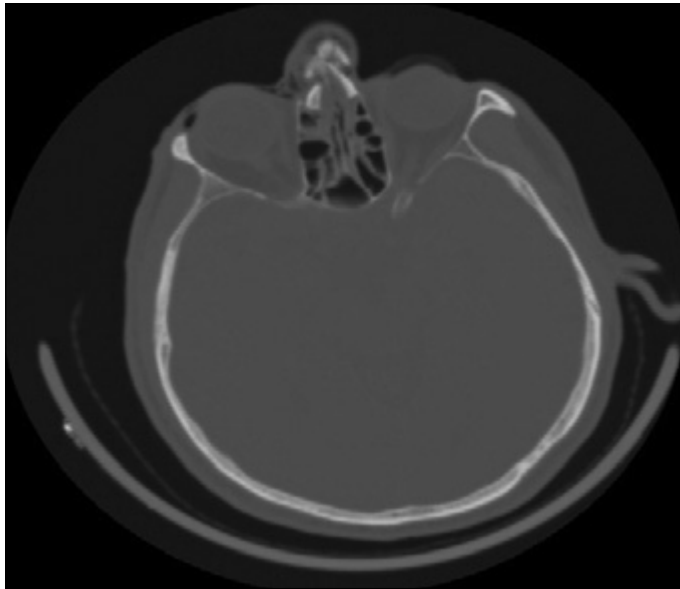


Figure 1. Axial view of nasal fractures on the cranial tomography

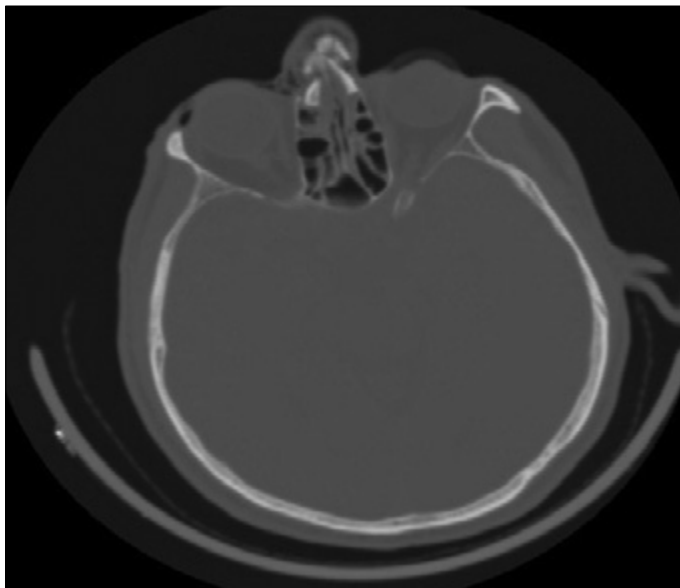


Figure 2. Sagittal view of nasal fractures on the cranial tomography

diagnosis and treatment by permitting better visualization in the nasal bone and maxillofacial and intracranial structures. Tezer et al. (7) concluded that computerized tomography was effective in diagnosing more nasal fractures in their examination of 20 patients. One important outcome of our study was that although nasal bone fracture was seen in all sections by tomography of the head, it was observed more in the axial and sagittal sections. However, in addition to all of this, while the total radiation in X-ray images taken in the front and side positions is 0.04 millisieverts (mSv), the level of X-ray exposure is approximately 50 times higher in cranial tomography, at 2.0 mSv. X-ray may therefore be preferred in patients with isolated nasal fracture with no head trauma.

Nasal fracture exhibits different demographic characteristics and etiologies in the world. The most common causes, in order of prevalence, in the literature are violence, falls, traffic accidents, and

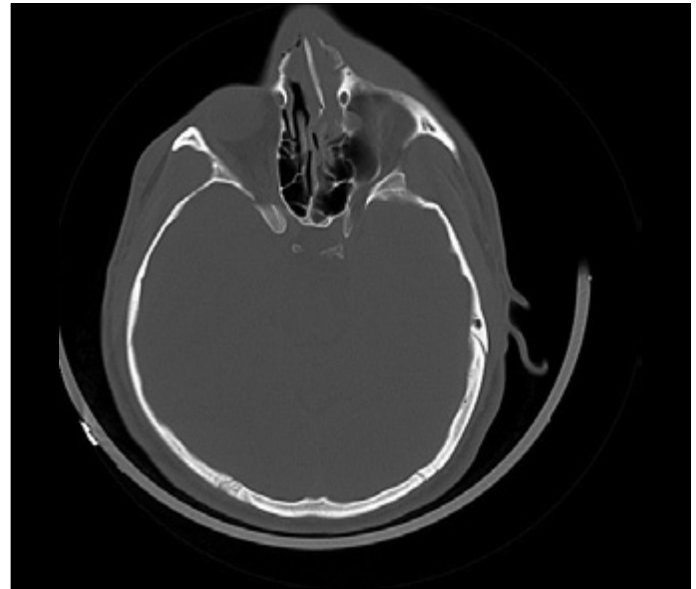


Figure 3. The view of Septal fracture on the cranial tomography

sports injuries (8, 9), while the most common causes in our region, in order, are falls, violence, general trauma, and sports injuries. Isolated fractures are more commonly seen in sports injuries, while tissue loss or multiple fractures are more the result of traffic accidents and falls from heights.

One important symptom in both medical and medicolegal terms that should be investigated in the emergency department is changes regarding smell perception. In their report of patients on whom they operated for trauma, Giancarlo et al. (10) reported that they encountered changes in smell perception in fractures in the frontal bone in particular, the nasal bone, and maxillary fractures. Our 2 patients with decreased smell perception were patients with maxillofacial trauma-related Le Fort III fracture and with brain trauma and rhinorrhea. This was associated with damage in the olfactory and frontal region of the brain by cranial tomography.

The most frequent neighboring organ injuries in patients with nasal trauma in our study were, in order, swelling in soft tissue in the nose and around the eyes and orbita and maxillary fractures, and we evaluated these as expected outcomes.

X-ray is a diagnostic tool that may be selected if there is no additional pathology beyond physical examination. While nasal bone fracture was observed at tomography in 8 of the 10 children administered tomography due to brain trauma in the under 18 age group, this could not be clearly differentiated by x-ray. This is associated with the higher level of cartilage at early ages in children and bone maturation as they develop. External fixation may therefore provide a significant benefit in the determination of pronounced fracture by x-ray in children. Septum pathologies frequently accompany nasal fractures. We determined septal deviation in 30 of our 77 patients. The number of cases determined in the examination findings was 16.

Study Limitations

The present study was a retrospective analysis. Data analysis was performed with imaging tests on the files of 77 patients presented to the emergency clinic between 2012 and 2013 and the number of samples was 77.

Conclusion

Falls from heights were the most common cause in patients with nasal fracture, and although the most common imaging technique employed was x-ray, tomography provided more detailed information concerning rhinorrhea, smell perception disorders, maxillofacial traumas, and multiple nasal fractures. The most common fracture was fissure-type, while septal pathology was observed in approximately 1 in 3 patients. Consultation with the ear, nose, and throat department; anterior rhinoscopy; and endoscopy in terms of rhinorrhea will assist accurate in the diagnosis of patients with nasal trauma in emergency clinics.

Ethics Committee Approval: Due to the retrospective nature of the study, ethics committee approval was waived.

Informed Consent: Due to the retrospective nature of the study, informed consent was waived.

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