

Assessment of nasal septal deformities by anterior rhinoscopy and nasal endoscopy

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Abstract

The aim of this study is to determine the percentage of the particular types of septal deformities in symptomatic patients according to Mladina's classification. The study included 100 patients with nasal septal deviation who were identified at the otolaryngology out patients clinic of Al-Kadymia and Tikrit teaching hospitals. All of the patients underwent nasal examination by anterior rhinoscope and nasal endoscopy. Pathological septal deformities were grouped into seven types by using Mladina's classification. The frequency of nasal septal deformation has been found to be 65% in males and 35% in females. The age incidence showed that most of the patients between second and fifth decades. The distribution of the seven types of septal deformity was 4%, 20%, 10%, 8%, 38%, 4%, and 16% respectively. The most common presentation in overall patients were nasal obstruction 85% and headache 50%. In the males type 5 deformity was more frequent and in females type 2. Nasal septal deviation was more prevalent in males. Nasal obstruction was the most common presenting complaint in all over types of nasal septal deviation. Nasal endoscope was of great value in assessment of posterior septal deformity.

Introduction

The nasal septum is composed of: A small anterior membranous portion. A cartilaginous part is composed of quadrilateral cartilage forming the anterior nasal septum. The quadrilateral cartilage is 3-4 mm thick in its centre but increases to 4-8 mm antero-inferiorly. It is bound firmly by collagenous fiber to the nasal bones and to perpendicular plate of the ethmoid and vomer and where it sits inferiorly in the nasal crest of palatine process of maxilla.

It abuts the maxillary spine at the inferior septal angle. Anteriorly it is attached by thin membranous septum to the medial crura of lower lateral cartilage.

A bony part formed by the perpendicular plate of the ethmoid, above and behind while the vomer form the posterior and inferior nasal septum and articulate its two alae with the rostrum of the sphenoid. The inferior border of the vomer articulates with the nasal crest formed by the maxilla and palatine bones. The anterior border articulates with the perpendicular plate above and quadrilateral cartilage inferiorly. The posterior edge of the vomer forms the posterior free edge of the septum (1, 2,3, and 4).

Aetiology of septal deviation

1. Trauma:

A-Direct trauma: Many septal deviations are due to direct trauma and this is frequently associated with damage to other part of the nose such as fracture of the nasal bone (5).

B-The birth molding theory: in many patients with septal deviation there is no obvious history of trauma but abnormal intrauterine posture may result in compression forces acting on the nose and upper jaw like in persistent occipitoposterior presentation. Displacement of septum can result and the nose can be exposed to further torsion forces during parturition. Combined septal deformity involving all septal components caused by compression across the maxilla regarding to the birth molding theory, while the anterior cartilage deformity of the quadrilateral septal cartilage caused by direct trauma(6,7,8,9,10)

2. Genetic factors:

Grymer and Melsen (1989) who were able to examine 41 pairs of identical twins suggested that anterior lesions were due to an external cause (trauma) whereas

the posterior lesions due to genetic factors(11).

A recent study by Ranko Mladina (2003) was found type 6 septal deformity (Mladina's classification) in 21 out of 22 both father and mothers of these children with type 6 septal deformity. The high correlation in the incidence of type 6 nasal deformities in mothers and their children and in fathers and their children suggests that this type of nasal deformity is inherited (12).

The normal nasal septum is straight, symmetrical and meets evenly arched palate in midline (6,7).

Varying degree of nasal septal deformity occur at a considerable rate at birth and in the adults with a suggestion that the nasal septal deformity of adults cases has commenced at birth ,and increasing with growth and age(7,8,9).

Nasal septal deformity is one of the most common disorders in human beings. These deformities may cause and aggravate sinusitis, upper airway infection and various middle ear infections. Symptoms such as nasal obstruction and postnasal discharge are associated with nasal septal deformity. The stuffed nose has an adverse effect on the development of the child. Also, it has been reported that nasal septal deformity has an important effect on the facial growth and development, especially in the first decade of life (13, 14, and 15).

Numerous epidemiological studies on the frequency of nasal septal deviation in human (from newborn period to adulthood) have been performed over the last decades. These studies were conducted on different age groups and used various classification .They showed rather variable prevalence rates, ranging from 0.93% in India to 55% in Greece (16, 17).

Material and Methods

Between August 2008 and March 2009, (100) cases of nasal septal deviation were identified at the otorhinolaryngology outpatient clinic of Al-Kadymia and Tikrit Teaching Hospitals. In all patients the following parameters were registered; age, sex, symptoms, history of trauma and type of nasal deformities.

Nasal examination was performed on each patients first by using Killian nasal speculum without previous administration of vasoconstrictive agents then after topical application of 1:1 solution of 10% xylocaine to the nostrils for 10 minutes, nasal endoscopy also done. Pathological septal deformities were recorded according to the Mladina's classification into seven types; the first four types refer to vertical deformities, types 5 and 6 to horizontal deformities and type 7 to a combination of the previous groups.

Type 1 is characterized by a vertical, unilateral ridge in the region of nasal valve, but without a direct contact with the valve, hence not compromising its function.

Type 2 is characterized by a unilateral vertical ridge that is in contact with the nasal valve area, thus compromising its function.

Type 3 is characterized by a unilateral vertical ridge, next to the head of the middle turbinate i.e. at the junction of quadrangular and perpendicular lamina.

Type 4 is characterized by bilateral vertical ridges, one in the valvular region on one side, and the other in the region of the middle turbinate on the contralateral side of the nose (s-shape septum)

Type 5 is characterized by an almost flat septum on one side or deviated and a basal, horizontal spur on the other side.

Type 6 is characterized by a deep horizontal gutter in the basal segment of the anterior septal region on one side and ridge formed from a wing of intermaxillary bone on the contra lateral side. Type 7 is characterized by combination of more than one type, so called crumpled septum. Mladina's classification of seven types of septal deformities is also graphically presented fig.(2).

Results

1-Age and Sex distribution :

Of the patients with septal deviation, 65(65%) were males and 35 (35%) were females. figure (3)

2-Presenting complaints:

Overall, from the 100 patients, 85 (85%) were complaining of nasal obstruction and 50 (50 %) had headache. The complaints

from the highest to the lowest are shown in figure(4).

3-Relation to trauma :

Of the patients with septal deviation 60 (60%) had a history of previous trauma while 40 (40%) had not,as shown in figure (6).

Discussion

Septal deviations are extremely common, but are not usually severe enough to affect nasal function. In assessing the septum, the degree of deviation as well as the site of the deviation is important; Cottle (1960) has named five areas of septum regarding the site of deviation. Mladina in 1987 suggested classification of septal deformities into seven types.

Assessment of septal deviations is usually quite obvious on anterior rhinoscopy, except in some cases with posterior deviation which need nasal endoscopy (type 3, 4, 5).

In the literature, rather variable rates on the prevalence of nasal septal deformities in different age groups have been reported. By far, several epidemiologic studies on nasal septal deviation have been conducted, in which different classification systems have been used (16, 18, 19, 20, 21, and 22).

On reviewing the studies in which Mladina's classification was used, type 1 and 2 deformities seem to constitute most of septal deformities. Subric and Mladina's study, using the same classification system demonstrate that the prevalence of deviations of the anterior (cartilaginous; type 1, 2 and 6) and posterior (osseous; types 3, 4 and 5) parts of the septum was 83.7 and 15.7% respectively (18). Type 1 deformities were the most frequent, followed by type 2 deformities, whereas type 7 deformities were the least frequent. In other study conducted by Min et al. in Korea, type 1 and 2 deformities also constituted most of the septal deformities, but he included only the 6-9 age groups (23).

Ilhami Yildirm (2003) in Turkey found that anterior deformities (type 1 and 2) were the most commonly encountered types in the pre-school children, but the occurrences of posterior deformities (type 3,4 and 5) was relatively increased as the age increased. In this study, neither the

distribution of nasal septal deformities types nor the overall prevalence showed any statically significant difference between both sexes (24).

A study of presenting complains showed that the nasal obstruction were the most frequent 85% ,followed by headache 50%,post nasal drip 28% and throat discomfort 22%.

A recent study conducted by Rao J. in India using the same classification demonstrated that horizontal deviations (type V accounted for the majority of patients deviations 63% followed by vertical deviations- type II (10%), type IV (10%) type III (8%). The male: female ratio in this study was 69:31 and the age incidence between second to fourth decades. A study of presenting complains showed that 74 of 100 patients had nasal obstruction and 41 had nasal discharge. Headache was the complaint in 20 and sneezing in 15, the other problems seen in small number of patients were throat discomfort, postnasal drip, epistaxis and snoring (25).

In our study, the prevalence of deviation of the anterior (cartilaginous); type 1, 2, 6) and posterior (osseous; types 3, 4, and 5) parts of the septum was 28% and 56% respectively. Type 5 deformities were the most frequent (38%),followed by type 2 (20%),type 7 (16%),and type 3 (10%) where as type 6 and 1 deformities were the least frequent and represent 4% for each type.

The male: female ratio in our study was 65:35 and the age incidence between second to fifth decades where the third decade represent the highest incidence (60%) followed by second decade (20%) and fourth decade(14%).

The results of studies on the prevalence of types of septal deformities point to that deformities of the anterior (cartilaginous) parts of the septum (type 1and 2) were the only ones observed in the youngest age group (2-6 years),where as older age groups were associated with a gradually increasing prevalence of deformities involving posterior (bony) parts of the septum (types 3,4 and 5),which is consistent with our results.

Differences in the results retrieved from the afore-mentioned studies may be related to the age groups studied. However,

Maran(26) said that age and race as a risk factors for nasal trauma should be kept in mind.

Takahashi(27) reported a study showing the racial distribution of nasal septal deformities. On the other hand, in the study conducted by Kawalsky and Przemyslaw(10) nasal septal deformity was found to be 22.2% in children born by spontaneous delivery but only 3.9% among the infant delivered by caesarean section.

In the light of this information, it can be thought that the different results found in our study, even though we used the same classification system, may be related to different age groups, traumatic factors including birth injury as well as racial factors.

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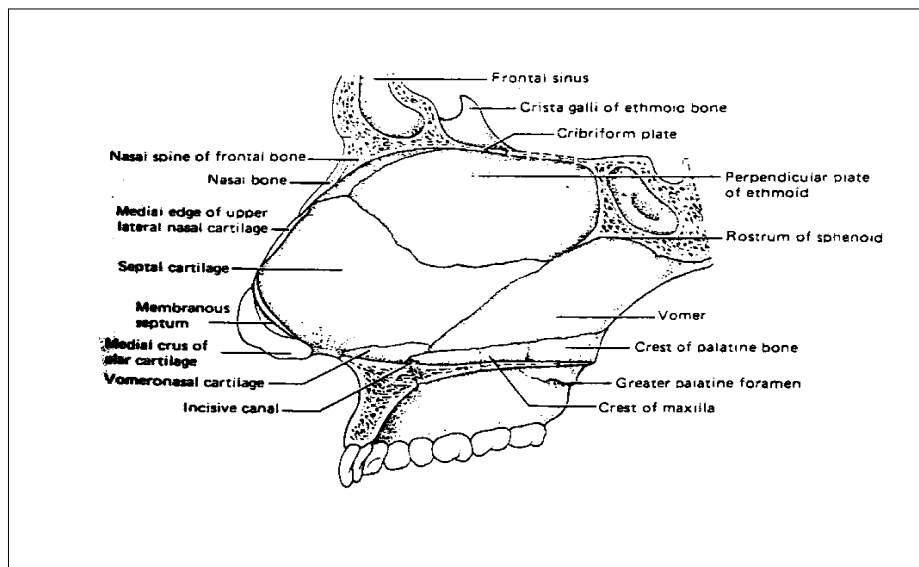


Fig.1 The cartilaginous & bony parts of the septum(10).

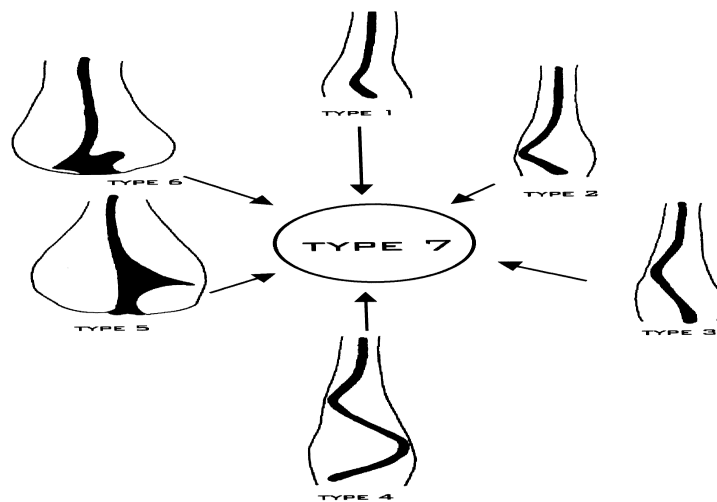


Fig. (2): Mladina's classification of seven types of septal deformities. Type 1-4 are presented as the nose is transparent and observed from above, whereas type 5 and 6 are presented in the anteroposterior view. Type 7 is a mixture of various types from 1 to 6

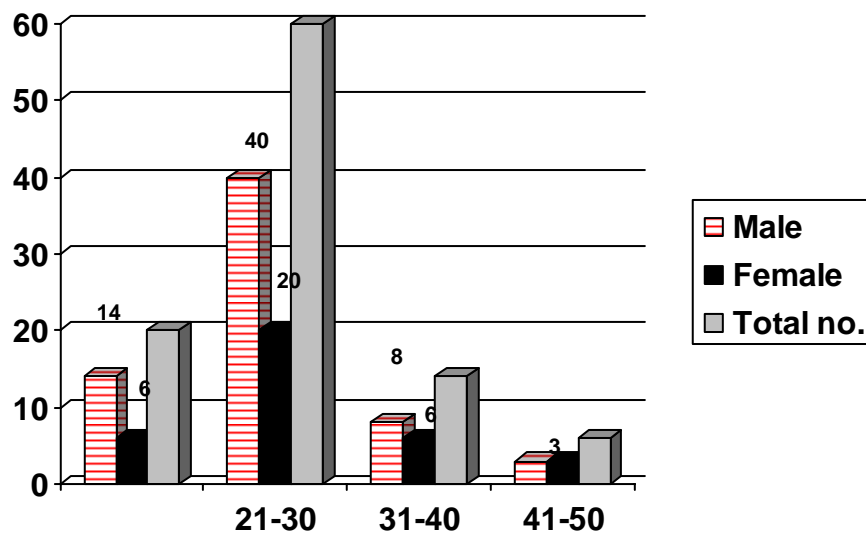


Fig 3: Number and (%) of patients according to age and sex groups.

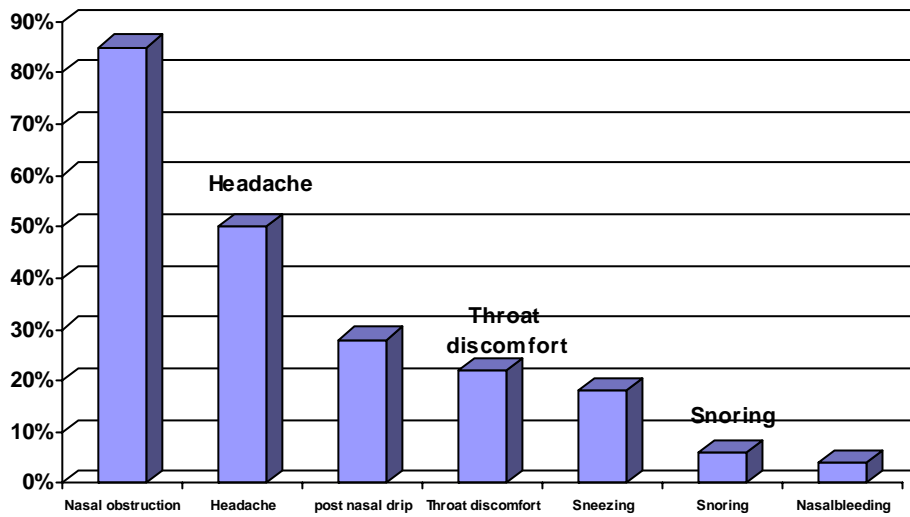


Fig 4. Types of presenting complaint.

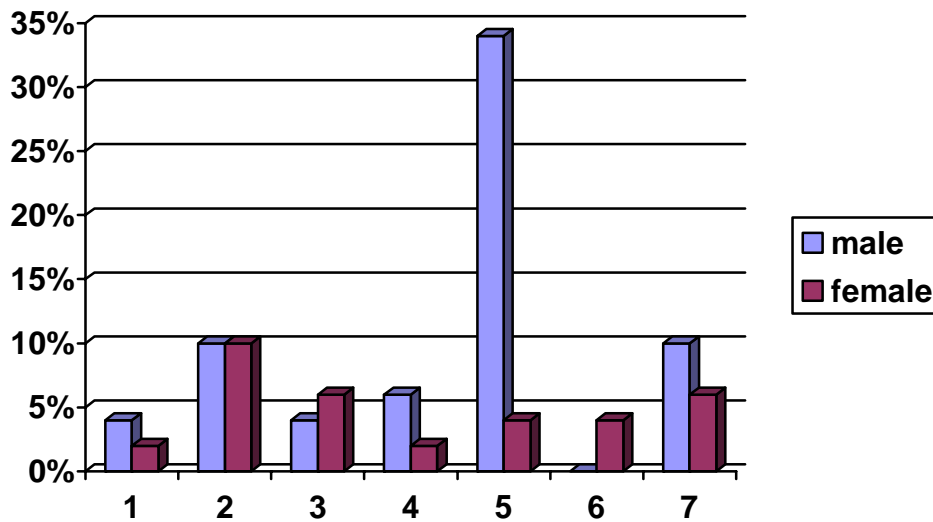


Fig 5. Percentage of each type of nasal deformity in males and

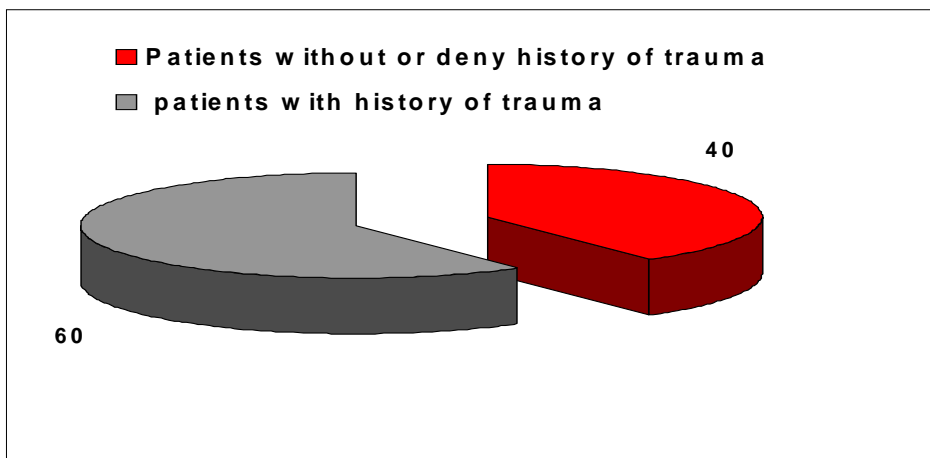


Fig 6. Number of patients in relation to trauma