NASAL SEPTUM DEVIATION IN CHILDREN - CLINICAL PRESENTATION AND METHODS OF TREATMENT. A REVIEW.

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ABSTRACT
The deviation of nasal septum is a common deformity observed in children, with an increasing tendency in older age groups. It can be both, symptomatic and asymptomatic, depending on its size, location and other personal anatomical characteristics; on the other hand it may be an inborn feature or originate from a trauma. Due to the children’s growing process they stand for an exceptional population. Continuous development of the nasomaxillary complex leads to changes in the facial proportions, which may then result in the enhancement of persisting deformities or affect other structures. It has also been questioned for many years, how the proper approach towards such cases should look like and whether it should require an immediate (after trauma or after diagnosis) surgery or pre-planned postponed procedure until the growth ceases or the symptoms are unbearable. In our review we tried to analyse this issue and find the most optimal up-to-date solution to this problem. We also concentrated on clinical manifestation in order to answer the question about the correlation between the deviation and rhinosinusitis.
asal septum is the structure that separates the nose into two symmetrical nasal cavities. It consists of three parts: bony, cartilaginous and membranous. The bony part consists of the perpendicular plate of the ethmoid bone and the vomer bone. The cartilaginous part is made up of the septal nasal cartilage and is located ventrally to the bony part. The membranous part lies in the vicinity of the external nostrils. The septum is covered by a well vascularised mucosa. According to research, the incidence of deformities within the nasal septum can reach up to 58% of people in the general population [1]. Such high prevalence provides the need to classify the deformities. The first one to do that was Mladina who divided septal deformities into six basic types and a seventh - a combination of the basic ones. Types 1, 2, 3 and 4 are so-called vertical deformities with the longer axis in the vertical plane. Types 5 and 6 are horizontal deformities and have a longer axis in the horizontal plane. Proposed classification is well accepted by specialists worldwide [2].

According to the analysis of the nasal septum morphology performed in a group of monozygotic twins it has been established that deformities of the anterior part are much more common than those of the posterior part (74% versus 21%) and that there is no coincidence between those two types of deformities, when analysing twins as individuals. When analysing twins as pairs a statistically significant correlation (p<0,05) was found in the incidence of symmetric changes, defined as changes in the same part of the septum within pairs. However, the incidence of asymmetric changes, also in the posterior part was more prevalent. It is assumed that the major factors responsible for the anterior part deformities are environmental, while genetic and epigenetic factors lead to the posterior deformities [4].

CLINICAL MANIFESTATION

The deviation of the nasal septum may be asymptomatic. However, patients with obstructed airways may complain of a variety of symptoms. According to Rao et al. the most common complaints are nasal obstruction, nasal discharge and headache, which occurred in 74%, 41% and 20% of cases respectively. Among other complaints patients reported sneezing, throat discomfort, postnasal drip, nasal bleeding, snoring and anosmia. Cacosmia was a very rare, but exceptionally unpleasant symptom [6]. Similar complaints were reported by other researchers [3].

ASSOCIATION WITH RHINOSINUSITIS

The coincidence of deviated nasal septum and rhinosinusitis has been investigated in many studies with conflicting results [7,12,13,14,15]. For a long time anatomic features were believed to play a major role in the pathogenesis of rhinosinusitis and these correlations were examined basing on the results of computed tomography imaging and nasal endoscopy. However, in many of those studies the groups of patients with deviated nasal septum were insufficiently low to find any binding conclusions as the main aim was concentrated on other anatomical deformities [7]. In some cases investigators tried to find a link between the side of the deviation and the side of the engaged paranasal sinuses, but usually it appeared to be bilateral [7]. One systemic review of 13 studies (chosen out of 300 references) showed a correlation between increased angles of the deviations and incidence of rhinosinusitis [7]. A statistically significant correlation, in all patients in 13 studies, showed increasing prevalence of rhinosinusitis with the angle over 15°. The deviation has been found most likely not to take part in the rhinosinusitis development at the angle of 10 degrees or less [7]. Nowadays, the pathogenesis of rhinosinusitis is believed to be multifactorial, with anatomical features being only partially responsible for the development of the inflammatory processes within the sinuses.
experimental studies, together with clinical experience have led clinicians to reconsider their stance on septoplasty in children.

For a long time, it was thought that all surgical procedures should be performed on the septum when the growth of the septal cartilage is complete, as so not to interfere with this process, having in mind the importance of the cartilage in the growth and the development of the nose. Now, there is evidence indicating that such delay of the procedure results in the disturbances of teeth eruption, malocclusion, face deformities or increased incidence of the respiratory tract diseases. According to the current standpoint of ENT specialists worldwide, septoplasty, when performed with adequate precautionary measures, may be performed in young children without fear of its interference with the ongoing growth process [25].

TREATMENT

There are many therapeutic possibilities for children with a deviated nasal septum. Primary endonasal septoplasty directly after diagnosis or after trauma is the most commonly chosen option. Others include septoplasty delayed to a certain age and external septoplasty in cases of severe deformations.

The comparison of endonasal and external septoplasty show equal functional results. Some studies found a slightly increased risk of post-surgical nasal deformities when external septoplasty was chosen [4], other studies found no difference between those two methods [16,18]. The most common post-surgical deformations were saddle nose or lowered nasolabial angle [17]. Some studies showed promising results of joining external septoplasty with rhinoplasty to prevent formation of deformities. Such a joint procedure gave less common adverse esthetical results when compared with endonasal septoplasty [19], however there is still little available data and more observation time is needed in order to receive strong comparable results. Only one study, which assesses the management options of nasal-septal deformity after trauma in children, advocates performing combined procedure of septorhinoplasty in cases of deformed nasal pyramid in order to prevent recurrent deformations and to achieve satisfying esthetical results [20]. The idea behind correcting external nose deformations concurrently with the septal deviation is based on observation of patients after correction of only one of the two co-existing deformities. In those patients the remaining deformation promoted disturbed growth and led to the recurrence of the previously corrected deformity [20]. So far, unfortunately, the perfect timing for correction of traumatic or non-traumatic cases has not been settled. More studies are needed, with some new findings suggesting intervention as soon as possible, even right after birth in some cases [4].

Septal deformation leading to significant narrowing of the upper respiratory tract is described as a relative indication for septoplasty. The most important aspects to consider are patient's symptoms. However, there are other situations, in which septoplasty is strongly indicated. These include: haematoma or abscess of the septum, severe septal deformation due to acute nasal fracture, dermatoid or cleft palate [4].

SUMMARY

The physiological breathing route in rest is the nasal cavity. Septal deviation obstructing airflow through the nose may lead to changes in breathing pattern and cause various disorders. Both diagnosing septal deviation and treatment is possible in children.

CITE THIS AS


REFERENCES


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TAB. 1. DNS – MLADINA CLASSIFICATION [3].

<table>
<thead>
<tr>
<th>Type</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type I</td>
<td>Presence of a unilateral crest which does not disturb the function of the nasal valve. It is situated in the area of the valve.</td>
</tr>
<tr>
<td>Type II</td>
<td>Disturbance of the valve function is caused by the unilateral crest. Positive Cottle’s symptom can be observed after raising of the nostril, which gives a subjective and objective improvement in the nose patency.</td>
</tr>
<tr>
<td>Type III</td>
<td>One unilateral crest at the level of the head of the middle nasal concha.</td>
</tr>
<tr>
<td>Type IV</td>
<td>Defines two crests – one at the level of the head of the middle nasal concha, and the other on the opposite side in the valve area, disturbing the valve functions.</td>
</tr>
<tr>
<td>Type V</td>
<td>A unilateral ridge on the base of the septum, while on the other side the septum is straight.</td>
</tr>
<tr>
<td>Type VI</td>
<td>A unilateral sulcus running through the caudal-ventral part of the septum, while on the other side there is a ridge and accompanying asymmetry of the nasal cavity.</td>
</tr>
<tr>
<td>Type VII</td>
<td>A mix of types from I to VI</td>
</tr>
</tbody>
</table>

TAB. 2. MOST COMMON SYMPTOMS ACCORDING TO RAO AT AL. [6].

<table>
<thead>
<tr>
<th>Presenting complaint</th>
<th>Incidence out of 100 cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nasal obstruction</td>
<td>74</td>
</tr>
<tr>
<td>Nasal discharge</td>
<td>41</td>
</tr>
<tr>
<td>Headache</td>
<td>20</td>
</tr>
<tr>
<td>Sneezing</td>
<td>15</td>
</tr>
<tr>
<td>Throat discomfort</td>
<td>8</td>
</tr>
<tr>
<td>Postnasal drip</td>
<td>8</td>
</tr>
<tr>
<td>Nasal bleeding</td>
<td>3</td>
</tr>
<tr>
<td>Snoring</td>
<td>3</td>
</tr>
<tr>
<td>Anosmia</td>
<td>3</td>
</tr>
<tr>
<td>Cacosmia</td>
<td>1</td>
</tr>
</tbody>
</table>
FIG. 1. PREVALENCE OF RHINOSINUSITIS WITH INCREASING SEPTAL DEVIATION ANGLE (FROM Elahi 2000).

FIG. 2. PREVALENCE OF RHINOSINUSITIS WITH INCREASING SEPTAL DEVIATION ANGLE (FROM Yasan 2005).

Illustration of the coincidence of the rhinosinusitis with the degree of septal deviation angle [from the article: 7]