

# Clinical and Radiological Characteristics of Nasal Septum Deviation in Adolescents with a Premorbid Background

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**Abstract** The basis of this scientific work is the examination data of 121 adolescent patients, aged 10 to 17 years, with nasal septum deviation and a premorbid background. The inclusion criteria for patients in the group were the presence of a deviated nasal septum, complaints of difficulty with nasal breathing, frequent headaches, and an impaired sense of smell.

**Keywords** Nasal septum deviation, Children, Rhinoseptoplasty

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## 1. Introduction

The functional and aesthetic role of the nasal septum is undeniable. Normally, as the main supporting structure of the nose, the nasal septum provides support and stability to the structures of the external nose and its position relative to the central vertical axis of the face [1].

Nasal septum deviation is a rather common phenomenon among the population. According to the literature, up to 96.5% of the population has some degree of nasal septum deviation. The normal position of the nasal septum is considered to be when it is located along the midline, corresponding to the sagittal line of the body. Deviation of the nasal septum as a pathology is widespread throughout the world. Septal deviation means its deflection to one side or the other from the median position, which is most often observed in traumatic injuries. Deformations refer to a change in one or more sections of the septum while it maintains a median position [2].

Nasal septum deviation (NSD) is one of the most common deformities of the facial skeleton. Impaired nasal breathing due to NSD leads to the development of oxygen deficiency, which clinically manifests as neurotic conditions, headaches, decreased memory, reduced concentration, sleep disturbances, and also leads to the development of cardiovascular diseases, which justifies the high rate of surgical activity for this pathology [3]. Deformation of the nasal septum disrupts the natural and rational architecture of the intranasal structures, which leads to a disturbance of the natural airflow through the nose. There are many classifications of nasal septum deviation, in which the main attention is paid to the characteristic shape of the nasal septum [4].

Currently, patients with complaints of difficulty in nasal breathing constitute one of the main categories of patients seeking an otolaryngologist's consultation. A standard ENT

examination in an outpatient setting allows for the detection of anatomical defects in the external nose and various deformities of intranasal structures, such as a deviated nasal septum, hypertrophy of the inferior or middle nasal turbinates, the presence of synechiae in the nasal cavity, polypoid processes, etc.. However, an important aspect in the examination and subsequent choice of the optimal management strategy for these patients is an objective assessment of the nasal respiratory function [5].

Strict recommendations for surgical treatment of children with a deviated nasal septum remain controversial, and at the core of this discussion lies the fact that the formation process of the nasal anatomical structures is not complete in certain age periods. In children aged 14-15, nasal septum deformation is more common in the cartilaginous and osteocartilaginous parts [6]. In modern rhinoplasty, there is still no consensus regarding the timing of surgical treatment for nasal septum deformation in children. Most otolaryngologists are in no hurry to perform surgical interventions on the nasal septum in children under 15-16 years of age, while others believe that rhinoseptoplasty can be performed between the ages of 6 and 14 [7].

According to most authors, the earlier the surgical intervention for a deviated nasal septum is performed in adolescents, the faster the function of the nasal cavity will be restored [8].

However, it should be noted that the surgical correction of the deviation should not only restore the anatomical proportions in the nasal cavity but also consider the functional results after the operation. [9]. Thus, the treatment of adolescent children with a deviated nasal septum is a complex problem. Some questions related to the pathogenesis of nasal septum deviation, morphological changes, and diagnostic and surgical treatment tactics remain open and require solutions [10].

**Aim of the study:** to study the clinical features of nasal septum deviation in adolescent children.

## 2. Material and Methods

An analysis of the treatment and examination results of 121 patients who were treated in the otolaryngology department of the Bukhara Regional Children's Multidisciplinary Medical Center for the period 2020-2024 was conducted. All pediatric patients underwent a comprehensive examination, including a detailed study of their complaints and medical history, a clinical examination of ENT organs, radiological examination of the paranasal sinuses, endoscopy of the nasal cavity and nasopharynx, and an assessment of the olfactory, secretory, and transport functions of the nose. A set of laboratory tests was also performed, including a complete blood count and biochemical parameters, and, if necessary, a bacterial culture for pathogenic flora and pH-metry of nasal mucosal secretions.

## 3. Results and Discussion

The analysis of the obtained data by age and gender revealed the following: younger adolescents (from 10 to 14 years old) accounted for 41 (34.2%) cases, of which girls were 18 (15%) and boys were 23 (19.1%) of the total number of subjects (Table 1).

**Table 1.** Distribution of pediatric patients with nasal septum deviation by age and gender

№	Gender	Age of Patients		Total: (n=121)
		10 to 14 years	15 to 17 years	
1.	Girls	18 (15%)	35 (28,3%)	<b>53 (43,8%)</b>
2.	Boys	23 (19,1%)	45 (37,5%)	<b>68 (56,2%)</b>
Total:		41 (34,2%)	80 (65,8%)	<b>121 (100%)</b>

Analysis of data by age and gender in the older age group (from 15 to 17 years) revealed the following: girls with nasal septum deviation sought medical help in 35 (28.3%) cases, while boys in this age group accounted for 45 (37.5%) patients. The older age group constituted 80 (65.8%) cases, which is more than half of the surveyed pediatric patients. In our opinion, the obtained results can be interpreted as

follows: first, boys in the older age group are more active, and the likelihood of physical trauma is higher than for girls of this age; second, rhinoseptoplasty is recommended by most doctors at an older age.

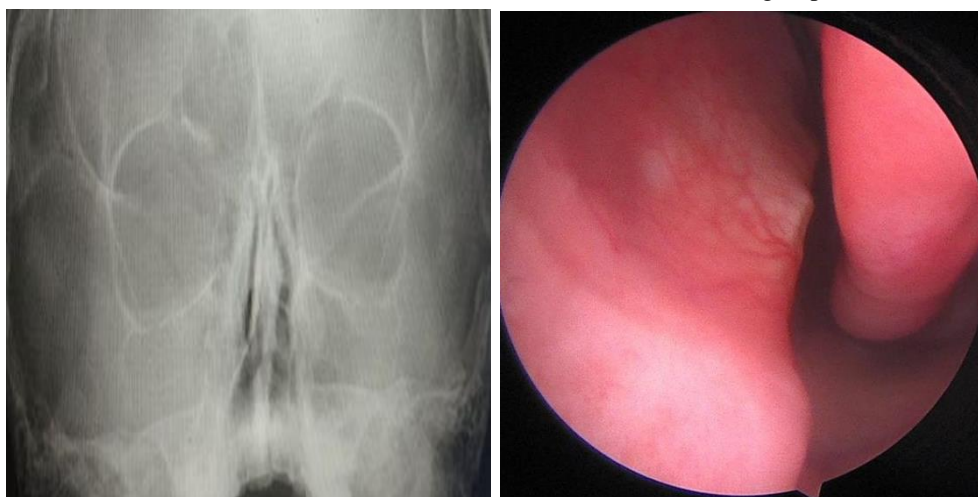
Nasal septum deviation is conventionally divided according to its location into cartilaginous, bony, and combined (osteocartilaginous). Analysis of the location of nasal septum deviations depending on gender revealed the following: in boys, a cartilaginous location of the pathological process was found in 27 (22.3%) cases, a bony location in 5 (4.1%) patients, and a combined, osteocartilaginous location was diagnosed in 36 (29.7%) cases (Table 2).

Analysis of nasal septum deviation data in girls showed that a cartilaginous location of the pathological process was found in 17 (14.0%) cases, a bony location in 5 (4.1%) patients, and a combined, osteocartilaginous location was diagnosed in 31 (25.6%) cases. Among all examined patients, the cartilaginous location of the pathological process was found in 44 (36.3%) cases, the bony location in 10 (8.3%) patients, and the combined, osteocartilaginous location was diagnosed in 67 (55.4%) cases.

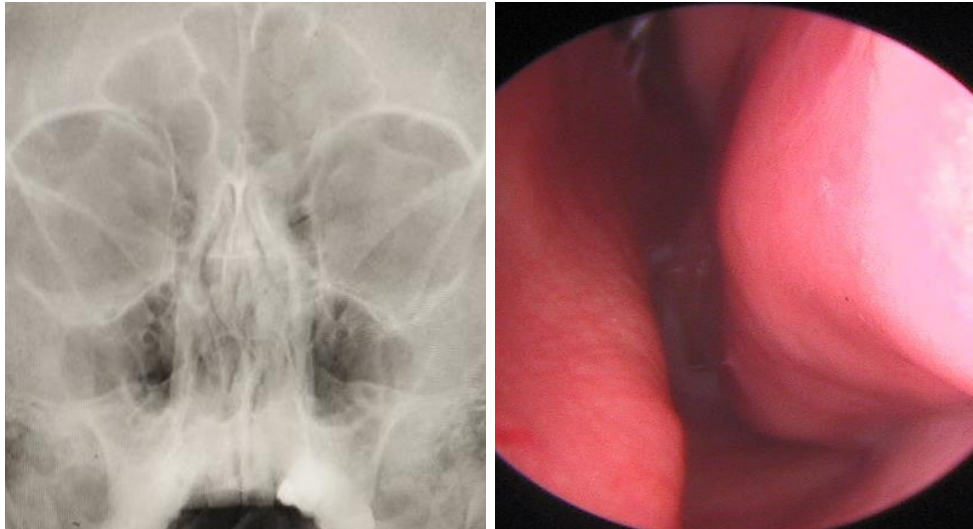
Anterior rhinoscopy and nasal endoscopy revealed septal deformities of various shapes and locations, significantly narrowing the common nasal passage in all examined patients.

An analysis of the data on the type of deviation depending on age and gender showed that a "crest" shaped deviation was found in 46 (38.0%) patients out of the total number surveyed (Fig. 1). Among them, it was diagnosed in 8 (6.6%) boys in the younger adolescent group and in 21 (17.4%) in the older adolescent group. The same form of deviation was diagnosed in 7 (5.7%) girls in the younger adolescent group and in 10 (8.3%) in the older adolescent group (Table 3).

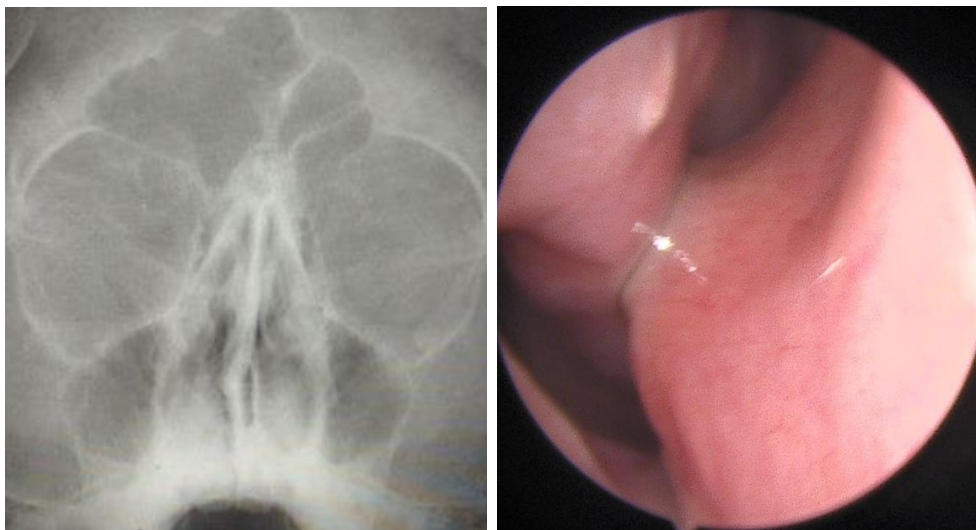
An S-shaped nasal septum deviation was identified in 38 (31.4%) patients of the total number surveyed, of which it was diagnosed in 9 (7.4%) boys in the younger adolescent group and in 12 (10.0%) in the older adolescent group (Fig. 2). The same form of deviation was diagnosed in 7 (5.7%) girls in the younger adolescent group and in 10 (8.3%) in the older adolescent group.



**Figure 1.** "crest" shaped deviation



**Figure 2.** S-shaped nasal septum deviation



**Figure 3.** Spur-shaped deviation of the nasal septum

**Table 2.** Location of nasal septum deviation depending on the gender of the pediatric patients

Gender	Cartilaginous (n, %)	Bony (n, %)	Osteocartilaginous (n, %)	Total: (n=121)
Boys	27 (22,3%)	5 (4,1%)	36 (29,7%)	68 (56,2%)
Girls	17 (14,0%)	5 (4,1%)	31 (25,6%)	53 (43,8%)
Total:	44 (36,3%)	10 (8,3%)	67 (55,4%)	121 (100%)

**Table 3.** Distribution of patients by the type of nasal septum deviation depending on age and gender

Type of Deviation	Younger Adolescent Group (10-14 years) (n, %)		Older Adolescent Group (15-17 years) (n, %)		Total: (n=121)
	boys	girls	boys	girls	
Crest	8 (6,6%)	7 (5,7%)	21 (17,4%)	10 (8,3%)	46 (38%)
S-shaped	9 (7,4%)	7 (5,7%)	12 (10%)	10 (8,3%)	38 (31,4%)
Spur	6 (4,9%)	2 (1,6%)	8 (6,6%)	8 (6,6%)	24 (19,8%)
C-shaped	3 (2,6%)	-	8 (6,6%)	2 (1,6%)	13 (10,8%)

A spur-shaped deviation of the nasal septum was diagnosed in 24 pediatric patients, which accounted for 19.8% of all surveyed adolescent children (Fig. 3). Among boys, the

spur-shaped deviation was diagnosed in 6 (4.9%) patients in the younger adolescent group and in 8 (6.6%) in the older group. The same form of deviation was diagnosed in 2 (1.6%)

girls in the younger adolescent group and in 8 (6.6%) in the older group. Note: The text states "2 (5.7%)", which is likely a typo as it does not match the total percentage; 1.6% is mathematically consistent.

Among the surveyed patients, the least common was the C-shaped nasal septum deviation, which accounted for 13 (10.8%) cases out of all those surveyed (Table 3). This form was diagnosed in 3 (2.6%) boys in the younger adolescent group and in 8 (6.6%) in the older group. This form of deviation was not found in girls of the younger adolescent group but was present in 2 (1.6%) in the older group. Note: The text states "8 (6.6%)", which is likely a typo as it does not match the total; 2 (1.6%) is mathematically consistent.

#### 4. Conclusions

In adolescents, deformations of the osteocartilaginous and cartilaginous parts of the nasal septum are predominant. In our opinion, the prevalence of deformations in the osteocartilaginous part of the nasal septum is related to differences in the growth and formation rates of bone and cartilage structures. According to our data, "crest" and S-shaped deviations of the nasal septum are frequently diagnosed in children, which confirms the uneven growth of individual septal structures, leading to its various deformations in the form of deviations, spurs, and crests.

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