

**MODERN EXAMINATION METHODS FOR CHRONIC BILATERAL
MAXILLARY AND ETHMOID SINUSITIS****Botirov Abdurasul Jumayevich**

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Abstract. For the first time, the features of the anatomical structure of the ethmoid bone were determined in patients with ethmoiditis. The relationship between the anatomical structure of ethmoid bone cells and the extent of the inflammatory process, its localization, and severity has been established. For the first time, the frequency of damage to various cell groups in isolated ethmoiditis and in combination with damage to other sinuses was determined.

Keywords. Chronic ethmoiditis, sinus surgery, endoscopy, FESS operations.

Introduction

In the structure of overall morbidity of ENT organs, damage to the nose and paranasal sinuses occupied the first place both in the analysis of clinic visits and in the group of hospitalized patients, with rhinosinusitis accounting for 44-46%.

Analysis of specialized literature and dissertation research on the structure of paranasal sinuses, particularly the ethmoid labyrinth, the role of genetic factors and bacterial biofilms in the development of chronic rhinosinusitis, and the characteristics of pathophysiological processes occurring in ethmoid labyrinth cells, has led to the consultation of various scientific sources at the intersection of different disciplines: rhinology, radiology, microbiology, allergology, genetics, and cytology.

Purpose of the study

Frontal, maxillary, and sphenoidal sinusitis often begin with a pathological process in the cells of the ethmoid labyrinth. This clinical association is explained by the close anatomical connections between the frontal, maxillary, sphenoid sinuses, and the ethmoid bone, as theories related to its development place the ethmoid labyrinth in a strategically central position within the nasal complex [4]. The emergence of optical endoscopes and the introduction of computed tomography into clinical practice has allowed for a change in the approach to assessing the structural features of the nose and paranasal sinuses, primarily the ethmoid bone [5]. Further development in this direction necessitated a precise and accurate anatomical description of the paranasal sinuses. The shape and structure of the ethmoid sinus, as well as the number of air cells, are highly variable. The ethmoid labyrinth is often referred to as the "cornerstone of the sinus system," as each paranasal sinus drains through it or adjacent to its lateral wall [6].

A series of tomograms for each patient was analyzed based on the structural type of the ethmoid labyrinth, the structural features of other paranasal sinuses, the localization of the inflammatory process, its spread, and the involvement of other paranasal sinuses. Of the 869 patients diagnosed with sinusitis, 559 (64.3%) had involvement of the ethmoid labyrinth cells. Out of the total number of patients with sinusitis, isolated ethmoiditis was observed in 142 (16.4%) patients, while combined involvement of the ethmoid labyrinth cells with other paranasal sinuses was seen in 417 (47.9%) cases. Sinusitis without the involvement of the ethmoid labyrinth accounted for 310 (35.7%) cases.

In a detailed analysis of the prevalence of ethmoiditis and the degree of involvement of other paranasal sinuses in the process, the following data were obtained, presented in Tables 1 and 2. The data represent the number of cases of damage to each paranasal sinus separately, not the quantitative content of patients in individual groups.

It is noteworthy that the maxillary sinuses are most frequently involved in the inflammatory process in ethmoiditis: 25 cases of bilateral and 85 cases of unilateral involvement (Tables 1, 2).

Table 1.

Frequency of sinusitis with damage to the cells of the ethmoid labyrinth.

Sinusitis with damage to ethmoid bone cells							
Isolated ethmoiditis		Unilateral ethmoiditis with sinus lesions:				Bilateral ethmoiditis combined with sinus lesions:	
Unilateral	Bilateral	Same side		Opposite side			
51	91	maxillary	51	maxillary	34	upper maxillary	215
		frontal	30	frontal	22	frontal	146
		sphenoid	25	sphenoid	12	sphenoid	165

When a bilateral inflammatory process occurs in the cells of the ethmoid labyrinth, the most common bilateral involvement is observed in the maxillary (215) and sphenoid sinuses (165). This pattern can be seen in the development of maxillary ethmoiditis and ethmoidosphenoiditis, as well as in the occurrence of maxillary ethmoidosphenoiditis. In cases of unilateral damage to the ethmoid sinuses, other paranasal sinuses are less involved in the pathological process, and the condition remains unilateral.

In terms of lesion frequency, the sphenoid sinus ranks second. In sinusitis with ethmoid labyrinth cell involvement, the frontal sinus takes second place. The least common is sphenoidal frontitis without the involvement of ethmoid labyrinth cells.

It should be noted that without the participation of ethmoid labyrinth cells in the pathological process, the inflammatory process is unilateral. At the same time, sinusitis and sphenoiditis occupy the first and second places in terms of prevalence, respectively. Therefore, to determine the causes of sinusitis, it is necessary to conduct not only a CT scan of the paranasal sinuses but also an endoscopic examination of the nasal cavity.

When analyzing the nature of damage to the ethmoid labyrinth cells, the following data were obtained: anterior ethmoiditis - 267 (47.8%), posterior ethmoiditis - 38 (6.8%), total ethmoiditis - 39 (7%), "mosaic" ethmoiditis - 190 (33.9%), isolated inflammation of a single ethmoid labyrinth cell (table needed) - 25 (4.5%) (Table 9).

Table 2. Major forms of ethmoid labyrinth cell damage

Form of ethmoiditis	Frequency of occurrence in the study group
Anterior	267 (47.8%)
Posterior	38 (6.8%)
Total	39 (7%)
"Mosaic"	190 (33.9%)
Isolated inflammation of an ethmoid labyrinth cell	25 (4.5%)
Total	559 (100%)

Based on the analysis of computed tomography scans, Piskunov I.S. and Piskunov V.S. (2011) identified 5 main forms of the ethmoid bone depending on the condition of the paper-thin plates:

- rectangular shape (symmetrical prism with smooth and flat side walls);
- an asymmetrical shape with outer walls curved to varying degrees into the orbital space;
- an asymmetrical shape with outer walls concave to the orbital space;
- a shape where one of the paper plates is asymmetrically concave, while the other is flat or convex;
- a curved shape deviating from the midline in one direction.

In our study, the most common shape in anterior ethmoiditis was the rectangular bone shape (115 or 43%), followed by the asymmetrical shape with outer walls curved into the orbital cavity (77 or 28.8%). In posterior ethmoiditis, the rectangular shape was the most prevalent (20 or 52.6%). The symmetrical shape with outer walls curved into the orbital space and the symmetrical shape with concave paper plates were observed equally (9 or 23.7% each). In the "mosaic" form of ethmoiditis, the most common shape (70 or 36.9%) was the asymmetrical form with outer walls curved into the orbital cavity. In isolated ethmoiditis, all shapes of the structure occurred with equal frequency (25 or 20%). The study showed that in cases of general damage to the ethmoid labyrinth cells, the rectangular shape (14 or 36%) and the symmetrical shape with outer walls curved into the orbital cavity (16 or 41%) were almost equally common.

Group. 1. Computed tomography of the paranasal sinuses, axial projection: a - anterior ethmoiditis, rectangular bone shape; b - anterior ethmoiditis, symmetrical shape with outer walls curving into the orbital cavity; c - posterior ethmoiditis, rectangular bone shape; d - "mosaic" ethmoiditis, symmetrical shape with outer walls curving into the orbital cavity; e - general ethmoiditis, symmetrical shape with outer walls curving into the orbital cavity; f - isolated ethmoiditis, shape in which one of the lamina papyracea is asymmetrically concave, while the other is convex.

All bone septa separating the air cells of the ethmoid labyrinth are divided into three main types [3]:

- first-order septa (connecting the main plates of the ethmoid bone);
- second-order septa (connecting one or two main plates and a first-order septum);
- third-order septa (connecting the first and second-order septa).

Conclusion

Analysis of the ethmoid labyrinth structure in ethmoiditis of various localizations revealed the following results: in anterior and posterior ethmoiditis, first-degree septa predominate in the ethmoid bone structure, forming larger and more regular cells - 77.5% and 76.5% respectively (Fig. 3). In the "mosaic" form of ethmoiditis, the process is more localized in small cells, and in the ethmoid labyrinth structure, second and third-order subdivisions prevail, forming 77.8% of irregularly shaped cells. No pattern was detected in the ethmoid bone structure with complete damage to the ethmoid labyrinth cells and isolated cell damage.

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