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PROBING THE SPHENOID SINUS THROUGH NATURAL OSTIUM

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Abstract. In the article justified the significance of endonasal probing of the sphenoid sinus through natural ostium as the main and soft method for conservative treatment of purulent sphenoiditis, and given indications for using this method, necessary tools, and technique.

Key word: purulent sphenoiditis, sphenoid sinus, endonasal probing, conservative treatment.

Endonasal probing of the sphenoid sinus through natural ostium is still not lost its relevance and significance in rhinology [1,4].

The appearance and technical development of endoscopy of the paranasal sinuses (PNS) allow directly examine and assess the condition of the nasal mucosa, the presence of inflammatory changes in the nasal passage, the functional state of natural ostium and the sinus membranes. However, endoscopy of the natural ostium of the sphenoid sinus is possible, but not always feasible due to its inaccessibility, especially in children [2,3,5].

Noted that in connection with the evolutionary transition of a person into the upright state, the anatomy of the maxillary sinus ostium was located not in the middle of the medial wall of the sinus, but in its upper parts [7,8,9,10]. We must note that this was largely reflected in the sphenoid sinus. The ostium of this sinus was also located in the upper parts, which makes it impossible for a spontaneous outflow of the pathologic discharge and therefore exerts an additional load on the function of the ciliated epithelium [3,6].

Thus, **the purpose of our study** is to prove the need for a wide and effective application of probing the sphenoid sinus through natural ostium.

Materials and methods of research. More than 110 years exist method of endonasal probing of the sphenoid sinus, but it still remains a rare manipulation of the practicing otorhinolaryngologist. This is due to insufficient knowledge of anatomical and topographic variations of the structure of nasal cavity and fear of damage to the vital structures of the skull. These factors restrain the development of the probing method in the practice of an otorhinolaryngologist.

Great clinical importance is the natural ostium of the sphenoid sinus, which, according to many authors, is located in the upper third of the anterior wall, below the level of the cribriform plate of the ethmoid bone.

Noted [3], that the natural ostium of the sphenoid sinus is 3-4 mm laterally from the nasal septum and 10-15 mm above the edge of the choana.

For the safe probing of the sphenoid sinus, the knowledge of the distance from the anterior nasal spine to the anterior wall of the sphenoid sinus is a great practical importance, this dimension is one of the main reference point. According to many authors, this distance ranges from 4 to 10 cm [4-6].

The shape and size of the natural ostium is very diverse. Four types of natural ostium are most often distinguished: round, oval, semilunar, slit-shaped. According to many authors, the size of a natural ostium varies from 0.5 to 7 mm, and the average size is 3-4 mm [7-9].

In the majority of cases, it is not possible to see natural ostium with anterior rhinoscopy, with rare exceptions - with severe atrophy of the nasal mucosa.

Thus, despite the great variability in the location, shape, and size of natural ostium, it is always located on the anterior wall of the sinus, and its dimensions make it possible in most cases to freely probe the sinus through natural ostium.

Indications for probing of the sphenoid sinus are:

1. Clinical signs of sphenoiditis or various neuro-ophthalmologic complications that require elimination of the pathology from sphenoid sinuses.

2. Decrease transparency, darkening of the sphenoid sinuses or presence of the liquid level on the x-ray or computed tomography.

3. Various pathological conditions of the sphenoid sinuses, requiring the introduction of medical or radioopaque substances.

4. Necessity to take pathological material from the sinus to bacteriological culture examination of the flora to antibiotics or cytological research.

5. Definition and improvement of drainage function of natural ostium of the sphenoid sinus.

Instrumentation for probing of the sphenoid sinuses:

At present, various cannulas are used for probing (metal, plastic, etc.). Our experiences of probing paranasal sinuses has proved that the high efficiency of the cannula, attached by a subclavian catheter with 0.6 or 1.0 mm with a wire conductor.

The cannula probe is 9-10 cm long with a deflected working end 5-10° from the axis. The

outer diameter of the cannula is from 1.5 to 3 mm.

The technique of endonasal probing of the sphenoid sinus:

The probing of the sphenoid sinus is performed in the patient's position while sitting with a slight extension of the headback. Manipulation is performed under local anesthesia. The first step is anesthesia with a 10% solution of aerosolized lidocaine, then a probe with a cotton swab moistened with a 0.1% solution of adrenaline and 2% solution of lidocaine is inserted between the nasal septum and the surface of the middle nasal concha. The main guideline for the advancement of the cannula is the Zuckerkandl line (it is defined by two points: the anterior nose and the middle of the free edge of middle nasal concha). The probe moves along this line along the nasal septum. With this position of the probe in most cases we reach the anterior wall of the sphenoid sinus. Accurate movements, without resorting to rough pushing, we perform rotational actions, until there is a sense of "failure" in the cavity through a narrow hole.

If there is a sensation that the probe rests against a dense tissue, rough advancement of its forward is unacceptable. On the successful penetration of the probe into the consistency indicates the sign of Grunwald - its fixation to the ostium. When performing manipulation, as most researchers indicate, it is necessary to remember the position of forcible movement of the cannula.

Sometimes, before the probe is inserted into the sphenoid sinus, the first stage is to search for the ostium with an ear-button cannula, then, after determining it, a cannula is inserted. With the introducing of fluid in the sinus, most patients feel pain and pressure in the occipital region.

At the first probing, it is possible to carry out a control x-ray in two projections.

The main obstacle to successful conduction of the sphenoid sinus is "obstruction of the middle nasal passage" (E. H. Huizing), which arises from the presence of deviated nasal septum, polyposis of the nasal cavity, hyperplasia or displacement of the middle nasal concha to the septum of the nose.

Through the cannula probe, the sphenoid sinus is washed, the introducing medications and radioopaque substances.

To improve the quality of the diagnosis of sphenoiditis, we used contrast X-ray imaging of the sphenoid sinuses (sphenography). This study is a valuable auxiliary method and allows you to determine the volume and contours of the sinus, as well as helping to assess the nature and extent of the pathological process, as well as determine the drainage function of natural ostium.

Contrast X-ray examination of the main sinuses was used when there was a discrepancy

between the clinic and the absence of a radiological manifestation of sphenoiditis. Sphenography was also used to monitor the effectiveness of the treatment. The contrast substance (water-soluble or oily) in the sphenoid sinus is introduced by means of endonasal probing with a hollow probe through natural ostium. Contrast study of the sphenoid sinus was carried out according to the standard method: after application anesthesia with a solution of 1% dicaine and 0.1% adrenaline between the nasal septum and the surface of the middle nasal concha, we injected a hollow cannula and conducted endonasal probing of the sphenoid sinus. In the x-ray room, patient with a head thrown back we slowly injected with about 5-10 ml of heated contrast into his sinus. The introduction of the contrast was stopped at the time of its admission into the pharynx, then X-rays were made in two projections: the nasal-chin and lateral.

Materials and method of research. In the private clinic “Otolaryngolog” for the period 2011-2017, the probing of the sphenoid sinus was performed in 92 patients. In 5 (5.4%) patients manipulation was impossible. Technical difficulties were associated with the deviation of the posterior-superior surface of the nasal septum. Complications after the manipulations were not determined.

Results of research. Our experience confirms the opinion of the authors [10-13] that, with a certain skill, probing is not very difficult and is a reliable and basic method of penetration into the sinus cavity without its opening and makes it possible to prevent surgical intervention at subsequent stages of treatment.

To confirm this conclusion, we present one of our observations.

Patient S., 44 years old. In 2014, he was hospitalized in the ENT department with complaints of a headache in the occipital region to the left, sleep disturbance, lowering of vision to the left eye. She considers herself to be ill for 3-4 years, this disease does not bind to anything, she repeatedly treated and was treated by a neurologist and ophthalmologist.

Based on complaints and data of the anamnesis was done computed tomography of the paranasal sinuses. Series of tomograms determined the total darkening of the left sphenoid sinus and the sinus of the ethmoid labyrinth.

Diagnosed: chronic left-sided purulent sphenoethmoiditis.

The patient repeatedly probed the left sphenoid sinus through natural ostium (during probe a purulent discharge was obtained). After discharge, the patient's state improved significantly. When examined after a year, the condition is satisfactory, headaches do not bother. The control computed tomography of the paranasal sinuses - pneumatization of the sphenoid sinuses is sufficient.

This example shows that probing the main sinus through natural ostium is a soft and most effective method of conservative treatment, preventing surgical intervention in this patient.

Conclusion

Thus, the probing method is the main method in the treatment of purulent sphenoiditis, since sphenoid sinus makes it impossible for the spontaneous outflow of the pathological discharge to be possible even when the ostium is sufficiently wide and, in our observations, in most cases was not completely obturated.

Therefore, the main principle in the treatment is evacuation of the purulent discharge and therapy aimed at restoring the function of mucociliary transport. The most effective method for purulent sphenoiditis in all age groups is to conduct probing of the sphenoid sinus through natural ostium. Probing should be done, having previously studied the individual and age anatomy of the nose and the sphenoid sinus.

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