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CLINICAL OBSERVATION OF SCHWANNOMA OF THE AUDITORY NERVE

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Abstract. Vestibular schwannoma (VS) (acoustic neuroma, neurolemmoma) is a predominantly slow-growing benign neoplasm. As a rule, VS develops from the cells of the superior vestibular part of the vestibulocochlear nerve at the junction of the “central” and “peripheral” types of myelin (Obersteiner-Redlich zone), located at a distance of 8-12 mm from the place where its root exits the brainstem, near the entrance to the internal auditory canal. In 5% of cases, tumors of this type grow from the cochlear part of the nerve [1]. VS account for approximately 8-10% of all primary intracranial tumors, 80-90% of tumors of the cerebellopontine angle [2]. The incidence of VS is 1 per 100,000 population per year [3]. Some authors note the prevalence of asymptomatic clinical forms, the frequency of which is about 7 per 10,000 population [4].

Keywords: Dichorionic, monochorionic, pathology of the placenta and umbilical cord, twin pregnancy

Introduction.

Multiple pregnancies are under a risk structural abnormalities of the placenta. Some placental and umbilical cord abnormalities which can be founded in multiple pregnancies are nonspecific and may be found in singleton pregnancies. Other anomalies are unique for multiple pregnancy and are mainly related to the type of placentation [1,2]. Early diagnosis is important when managing a twin pregnancy. Determination of chorionicity, amniogenicity and identification of placental anomalies are key issues for the management of multiple pregnancies [3,4].**Relevance:** Vestibular schwannoma (VS) (acoustic neuroma, neurolemmoma) is a predominantly slow-growing benign neoplasm. As a rule, VS develops from the cells of the superior vestibular part of the vestibulocochlear nerve at the junction of the “central” and “peripheral” types of myelin (Obersteiner-Redlich zone), located at a distance of 8-12 mm from the place where its root exits the brainstem, near the entrance to the internal auditory canal. In 5% of cases, tumors of this type grow from the cochlear part of the nerve [1]. VS account for approximately 8-10% of all primary intracranial tumors, 80-90% of tumors of the cerebellopontine angle [2]. The incidence of VS is 1 per 100,000 population per year [3]. Some authors note the prevalence of asymptomatic clinical forms, the frequency of which is about 7 per 10,000 population [4]. In 95% of cases, VS is unilateral. The frequency of VS increases in patients with neurofibromatosis type 2, with bilateral VS being pathognomonic. Both unilateral

and bilateral neuromas develop as a result of genetic disorders of the 22nd chromosome, while the function of protein synthesis controlling the growth of neurolemmocytes changes [5]. The classification of VS is based on various principles: the nature of the course, the stage of the disease, the size of the tumor, the severity of clinical symptoms. According to the nature of the course of the disease, three groups of VS are distinguished: non-growing or very slowly growing (less than 0.2 cm per year), slowly growing (0.2–1 cm per year), and rapidly growing (more than 1 cm per year) [6]. Depending on the size of the tumor and the severity of symptoms, some authors distinguish three stages in the clinical course [7], others — four stages [8]. In 1997, a classification was proposed that reflects the anatomical and topographic characteristics of tumors based on MRI data [9, 10].

When removing a cerebral nerve with a diameter of up to 1 cm, the preservation of the function of the VII pair of cranial nerves is 95–100% (grades I–II according to the House–Brackmann scale); 1–2 cm — 80–92%, more than 2 cm — 50–76% [19, 23]. With a diameter of the cerebral nerve more than 4 cm, normal function of the facial nerve (grades I–II according to the House–Brackmann scale) can be preserved only in 40–50% of patients.

Vestibular disorders (dizziness, static-coordination disorders) are one of the most important and leading clinical symptoms of vestibular analyzer damage in VS and can be the first symptoms with hearing intact. In such situations, it is especially important to differentiate VS from the cochleovestibular symptom complex in vertebrobasilar insufficiency.

Clinical case. Patient K., 40 years old, in November 2024 came to the Department of Neurosurgery of the Multidisciplinary Clinic of Samara State Medical University complaining of significant hearing loss (almost deafness) in the right ear, pain and numbness in the right half of the face. According to the anamnesis, 10 years ago (2014) the patient first noted a sharp decrease in hearing in the right ear, gradually progressing to a significant decrease. Subsequently, she was repeatedly audiologically examined, consulted by ENT specialists with courses of vasoactive therapy, including in a hospital setting. She did not note any positive dynamics in hearing. Three years ago (2021), after a stressful situation, the hearing in the right ear sharply deteriorated and numbness in the right half of the face joined in. The patient denied vestibular symptoms and tinnitus. Over the past 3 years, the patient has repeatedly consulted otolaryngologists and neurologists. Prescribed vascular/metabolic therapy did not improve the symptoms. Examination results. The patient's general condition upon admission is satisfactory. Internal organs are normal. Comprehensive otolaryngological examination data: the shape of the auricles is correct, the auricular areas are visually unchanged, painless upon palpation/percussion. The external auditory canals are wide and free. Otomicroscopy data: the external auditory canals are free, the eardrums are gray, the landmarks are contoured.

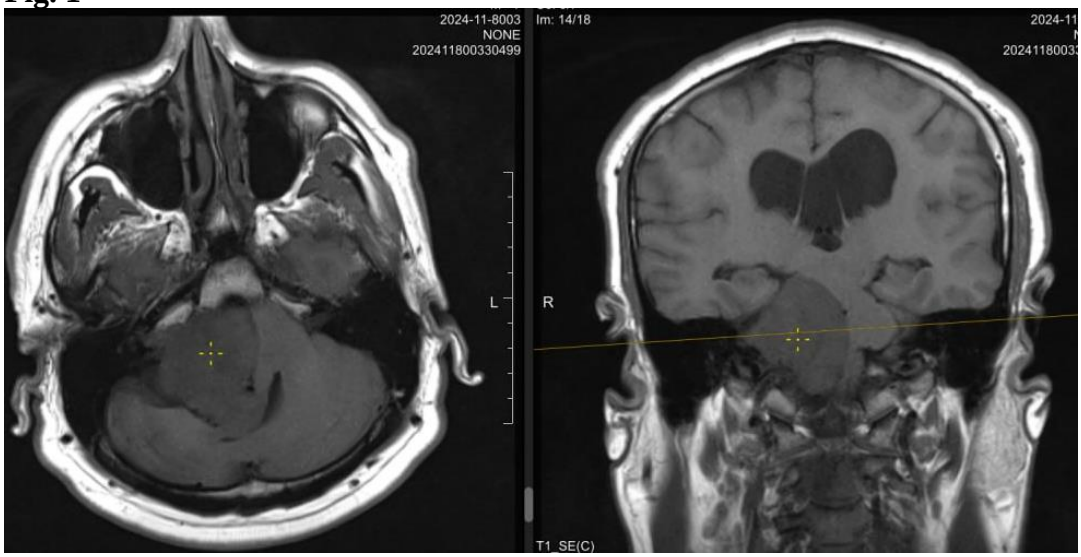
Results of a comprehensive neurological examination: general cerebral symptoms are present. There are no meningeal symptoms. Eye slits D=S, full eye movements, corneal reflexes are active, D=S. Swallowing and phonation are not impaired. Hyperalgesia of the right half of the face, palpation of the trigeminal nerve exit points is painful on the right side. No paresis. Muscle tone in the limbs is unchanged, D=S. Tendon and periosteal reflexes are of moderate vivacity, S=D. No pathological foot signs. Marinescu-Radovići reflex on both sides. No sensory disorders on the trunk and limbs were detected. Coordination tests are performed clearly on both sides. There are no speech disorders. Upon admission to our clinic with these complaints, the patient was referred for an MRI of the brain (Fig. 1).

Conclusion of MRI of the brain: Large volumetric formation (vestibular schwannoma, acoustic neuroma) in the projection of the cerebellopontine angle on the right. According to the Koos classification - stage IV (over 30 mm (50 mm * 55 mm * 29 mm), the tumor compresses and displaces the brainstem to the left. According to the Samii classification - stage T4b (tumor compresses the brainstem with lumen deformation and compression of the IV ventricle).

Based on the above complaints and additional research methods, the patient was diagnosed with: Benign neoplasm of the brain under the tentorium cerebri (ICD 10 - D33.1). Neoplasm of the cranial nerves (ICD 10 - D43.3). Vestibular schwannoma in the projection of the cerebellopontine

angle on the right, compressing and displacing the brainstem to the left, compressing the brainstem with deformation of the lumen and compression of the fourth ventricle. Hypoacusis on the right. Trigeminal neuralgia on the right.

Fig. 1



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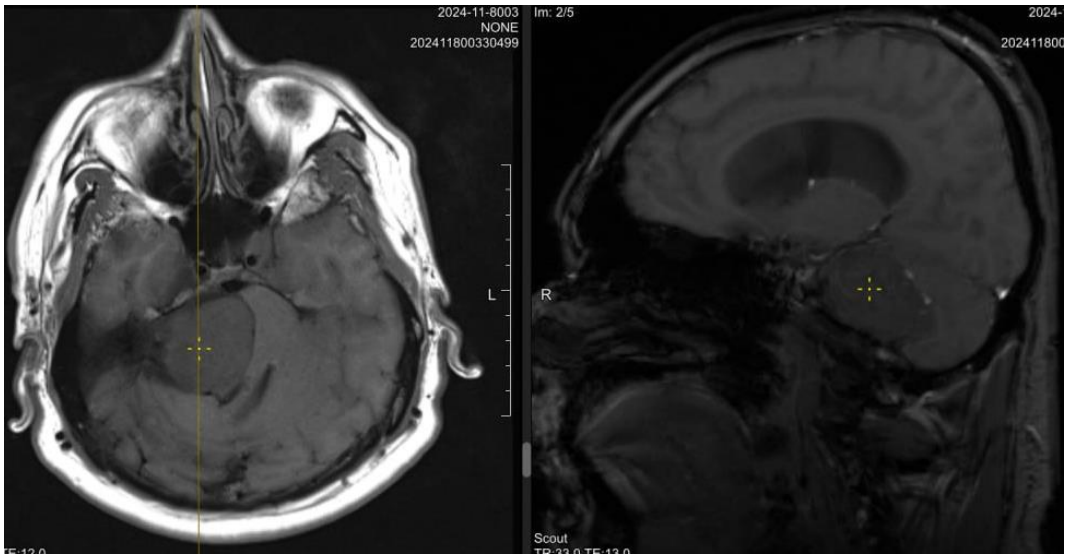

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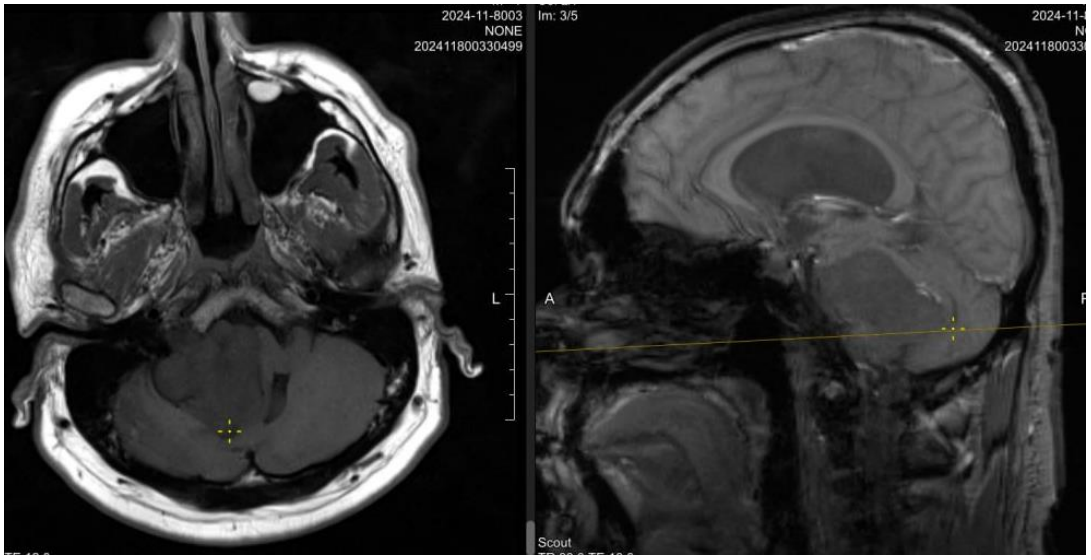

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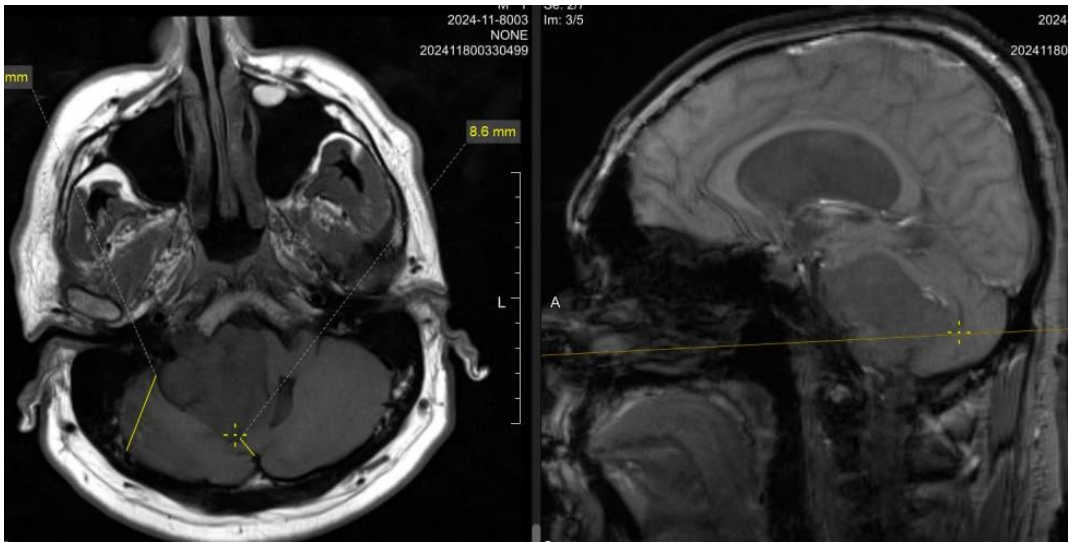

The patient was referred to a neurosurgeon for consultation, and it was recommended to perform surgical treatment as soon as possible. After 1 month, the patient was successfully operated on in the neurosurgical department. In the postoperative period, slight smoothing of the nasolabial fold on the right was noted. Neurological and otology status without negative dynamics.

5. **Conclusions:** According to the literature, hearing loss in HN is diagnosed in 95% of cases, including gradual hearing loss in 80–90% of cases and a sharp decrease in 10–20%. Facial hypoesthesia is observed in 58–72% of cases. The presented clinical observation demonstrates the need for timely diagnostics in patients with unilateral progressive hearing loss. In patients with HN, contrast-enhanced MRI provides maximum diagnostic information about the localization, size, structure of the tumor, and its location relative to the surrounding parts of the brain matter (brainstem, cerebellum) in the intracranial space. The use of T1-mode with contrast enhancement is the "gold standard" in the diagnosis of HN [9, 10]. Early diagnosis of HN helps to avoid serious consequences and the development of complications associated with the impact of the pathological process on the VIII nerve and the anatomical structures located in close proximity: the brainstem, cerebellum, V and VII cranial nerves. It should also be noted that for preoperative prognosis it is necessary to evaluate the condition of the bone structures, their connection with the neuroma; additionally, it is recommended to perform a computed tomography of the skull.

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