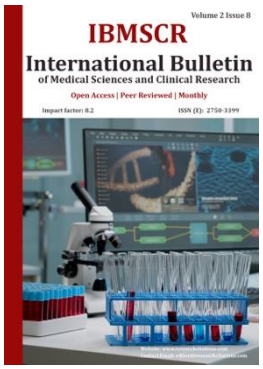

PITUITARY ADENOMA TREATMENT APPROACHES AND TACTICS OF PATIENT MANAGEMENT

Ergasheva Gulshan Tokhirovna
Assistant of the Department of Clinical Sciences
Asian International University, Bukhara, Uzbekistan
E-mail: ergashevagulshantoxirovna@oxu.uz
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Abstract: A pituitary adenoma is a tumor of the endocrine system, the manifestations of which are hyper- or hyposecretion of hormones of the anterior pituitary gland, as well as clinical symptoms caused by the impact of the neoplasm on the anatomical structures surrounding the sellar region. Among intracranial tumors, pituitary adenomas occupy third place, accounting for 7.3 to 18% of all verified brain tumors and affecting mainly people of working age, which accounts for about 75% of all cases of the disease

Pituitary adenomas are quite common (15-17%). Chronic hyperproduction of adenohypophysis hormones reduces the quality of life.

Keywords: giant pituitary adenomas; diagnostics; treatment

With hyperprolactinemia, about 30% of patients are infertile. Mortality in corticotropic and somatotropic pituitary tumors exceeds the population mortality rate by 5-10 times. At autopsy, pituitary adenomas are found in 25% of deceased people without any indication of endocrine diseases. The incidence of tumors increases with age. Hyperplasia of pituitary cells usually occurs under the influence of the hypothalamus. Tumors develop most often when one cell mutates and gets out of physiological control usually they are monoclonal, but there may be a tumor from one clone, and then a relapse, but from another clone. The pituitary gland contains the most somatotrophs (40-50%), therefore the largest tumors are somatotropinomas, then prolactotrophs (15-25%), corticotrophs (10-20%), gonadotrophs (10%) and thyrotrophs (5%).

Pituitary adenomas are tumors of monoclonal origin. They are heterogeneous in their morphological structure and have receptors for hypothalamic factors, and are also capable of synthesizing and secreting adenohypophysis hormones, neurohormones, and growth factors. Adenomas have different growth rates and different invasiveness. Pituitary tumors in 95.7% of cases are benign and slow-growing, however, the development of neuro-ophthalmological and endocrinological disorders in patients, and in some cases - focal neurological symptoms, causes the need to make a decision on the possibility of surgical, radiation or other methods of treatment. A distinction is made between microprolactinomas (size up to 10 mm), macroprolactinomas (more than 10 mm) or giant prolactinomas (more than 4 cm).

Clinical manifestations of pituitary adenomas (mass effect) are:

• compression of normal pituitary
tissue and development of adenohypophysis cell atrophy
• hyperprolactinemia due to compression of the pituitary stalk
• headaches
• compression of the optic-chiasmatic crossing
• compression of the III, IV, VI pairs of cranial nerves, 1st and 2nd branches of the trigeminus (with tumor expansion into the cavernous sinus)

• intracranial hypertension with development of
hydrocephalus (with compression of the floor of the III ventricle).

Most often, pituitary tumors occur at the age of 30-60 years.

As the tumor grows, there is a consistent loss of pituitary tropic function with a decrease in the levels of luteinizing hormone, follicle-stimulating hormone, thyroid-stimulating hormone, and adrenocorticotropic hormone against the background of functional hyperprolactinemia . The endocrine manifestation of pituitary adenoma can be partial or complete (in macroadenomas) hypopituitarism, which often results in reproductive health disorders. The most common initial symptoms were decreased potency (in 57.9% of patients), visual field defects (in 11.6% of patients), headache (in 11.3%) . According to other authors, reproductive disorders can occur in 78.3% of patients with inactive pituitary adenomas.

Diagnosis of pituitary adenomas

If a pituitary adenoma is suspected, it is necessary to conduct a craniography (sella turcica), an examination by an endocrinologist, an ophthalmologist (visual fields), and visualize the pituitary gland using MRI/CT. MRI is preferable to CT. But in some cases, both MRI and CT are indicated. In emergency cases or in patients with contraindications for MRI, CT is an acceptable alternative. Studies should be conducted in centers with sufficient experience in conducting such studies. It is necessary to clarify the nature of hormonal studies and refer the patient to a specialized clinic.

A feature of hormonal studies is that a single determination of the hormone content in the blood serum most often does not provide reliable information. Blood sampling should be done taking into account physiological influences. Magnetic resonance imaging (MRI) allows to examine the structure of the pituitary gland, identify and assess the size and prevalence of space-occupying pituitary lesions (adenomas, cysts, craniopharyngiomas, etc.), determine the presence of hemorrhages and their duration, and assess the effectiveness of conservative and surgical treatment. MRI allows to identify a tumor, as well as to assess its position in the sella turcica and its relationship with the surrounding brain structures, primarily with the chiasm and optic nerves.

Despite the leading role of instrumental examination methods in the diagnosis of pituitary adenomas, anamnestic and clinical data help to diagnose the presence of an adenoma at earlier stages of the disease.

Treatment of giant pituitary adenomas. Comprehensive examination of patients (determination of blood serum hormones, use of tests to determine a particular type of hormonal deficiency; computed tomography and/or MRI; development of optical technology and microsurgery) can significantly improve the results of surgical treatment. The possibility of more radical tumor removal has expanded while reducing postoperative mortality. However, despite the successes achieved, the problem of treating patients with pituitary adenomas is far from being solved [14–18]. Nevertheless, to date, there is no algorithm for correcting hormonal disorders in patients with pituitary adenomas in the early and late postoperative periods, which largely determines the quality of life. Giant pituitary adenomas with a maximum diameter of at least 40 mm continue to pose high surgical risks, despite advances in microsurgical and/or endoscopic surgery. Thus, Japanese authors concluded that preoperative embolization of giant pituitary adenoma is a useful procedure that can potentially reduce morbidity and mortality from this devastating tumor.

N. Nishioka et al. [16] presented a series of giant hormonally inactive adenomas and pointed out the limitations of effective and safe resection of giant pituitary tumors. In total, 93 patients (72.7%) underwent complete or subtotal tumor resection. The authors concluded that, regardless of the surgical approach, large intracranial traction, irregular configuration, and invasion are factors limiting effective resection.

According to T. Graillon et al. [8], the transcranial approach to tumor removal remains in demand for giant and invasive pituitary adenomas in conditions of inaccessibility of the transsphenoidal approach. In this case, the possibility of vascular complications, visual impairment, preoperative symptoms of patients, and benign features of the tumor should be taken into account

Conclusions

In the diagnostic complex for giant pituitary adenomas, in addition to clinical examination, it is necessary to use a full range of neuroimaging methods to determine the location of the chiasm, the extent of tumor spread to the base of the skull and the destruction of the latter.

Surgical treatment is the method of choice when diagnosing giant pituitary adenoma, with the exception of isolated cases of STH- and prolactin-secreting tumors, in which treatment with dopamine agonists is possible. At the same time, for giant pituitary adenomas (diameter more than 4 cm), there is no single algorithm for the optimal surgical strategy.

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