
# Ophthalmological Disorders In Patients With Giant Inactive Pituitary Adenomas

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ABSTRACT

A total of 68 patients with giant inactive pituitary adenomas (43 men and 25 women) were examined. The average age of the men was 37.12 years, while the average age of the women was 38.15 years. The duration of the disease ranged from 2 months to 25 years.

The most common tumor growth among patients was endo-suprasellar - 28(41.1%).observations.The most pronounced visual field disturbances in the form of amaurosis and bitemporal hemianopsia were observed in patients with endo-suprasellar growth – amaurosis(10.7%), bitemporal hemianopsia(89.3%), as well as in the case of a total growth variant – amaurosis(23%), bitemporal hemianopsia(79.9%)The most pronounced neurological disorders in the form ofdiencephalic-stem disorders (pyramidal symptoms, decreased reflexes and diffuse muscle tone) were observed in patients with a total growth variant, with retrosellar growth and with invasion into the brain

**Keywords:** **Giant, inactive, pituitary adenomas**

**Introduction.** Inactive pituitary adenomas (IPA) are benign pituitary tumors arising from adenohypophyseal cells, accounting for one-third of all pituitary adenomas. Clinically apparent IPA are usually, although not always, macroadenomas, and patients often present with mass-effect-related symptoms such as headache, visual disturbances, and/or cranial nerve dysfunction.[1,2 ].These tumors may also come to the attention of a physician as an incidental finding when an MRI is performed for unrelated signs and symptoms.[3]or, less commonly, as a consequence of hormonal deficiency of the anterior pituitary gland or hyperprolactinemia due to compression of the pituitary stalk[4]Guidelines for the management of incidental NAGs have recently been published.[5]. NEGs can also present as sinonasal or nasopharyngeal tumors without contact with the sella turcica. In such cases, they should be differentiated from other tumor types found in this region, such as primary or metastatic neuroendocrine tumors or olfactory neuroblastomas.

Visual signs and symptoms are a common manifestation of pituitary adenoma due to compression or ischemia of the optic nerves and optic chiasm. Although bitemporal hemianopsia is a classic manifestation of visual field deficit, these tumors can cause additional visual impairment. After endoscopic endonasal pituitary surgery, most patients experience improvement in visual symptoms. Preoperative factors, including retinal nerve fiber layer thickness, severity of preoperative deficit, duration of visual symptoms, tumor size, extent

of resection, and patient age, serve as possible predictors of postoperative visual outcomes [6].

A recent NAG guideline states thatFor asymptomatic, hormonally inactive tumors, the standard treatment is a "wait and see" strategy. In case of (impending) visual impairment, surgical treatment is performed by an experienced pituitary surgeon. If surgical resection is incomplete or if tumors recur, multidisciplinary treatment options (e.g., reoperation, radiation therapy, observation) should be considered.[7].

The above served as the reason for the present study.

**Purpose Of The Study**– to study ophthalmological and neurological disorders in patients with giant inactive pituitary adenomas.

**Material And Methods.** We examined 68 patients with giant inactive pituitary adenomas (43 men and 25 women). The average age was 37.12 years for men and 38.15 years for women. The disease duration ranged from 2 months to 25 years.

In our study, we relied on the classification of Kurokawa Y., (1998), who considers tumors to be giant if they are larger30 mmAnd40 mm.

A total of 60 transnasal pituitary adenomectomy (TAP) were performed in three Tashkent centers (MD, PhD, Akbutaev A.M., prof. Makhkamov K.I., RPh. Michael Powell from the UK). Repeated pituitary surgeries were performed in 5 patients (7.3%). 5 patients (7.4%) received radiation therapy and 1 patient (1.5%) received chemotherapy.

The research methods included: 1) general clinical (examination of endocrine and neurological status), 2) instrumental (perimetry in all colors, fundus, visual acuity, 3) ECG, CT/MRI of the sella turcica and adrenal glands, 4) ultrasound of internal and genital organs, etc.), 5) hormonal blood tests (STH, IGF-1, LH, FSH, PRL, TSH, ACTH, prolactin, testosterone, estradiol, progesterone, cortisol (RIA studies of blood serum were performed on Gamma-12 and Strantg 300 counters). In addition, the postoperative material was subjected to histological diagnostics at the RSPMTS E MHRU named after academician E.Kh. Turakulov (histology room).

The obtained data were processed using Microsoft Excel and STATISTICA_6 computer programs. The arithmetic mean (M) was calculated,standard deviation of the arithmetic meanor the error of the arithmetic mean of all n repetitions (m).The significance of differences in levels between groups was assessed using the confidence interval and Student's t-test (p). Differences were considered statistically significant at $p<0.05$.

**Results. .**Table 1 shows the distribution of patients by gender and age.

**Table 1 .**
**Distribution of patients by gender and age**

| Age, years | Number of men | Number of women |
|---|---|---|
| **13 years - 15 years** | - | - |
| **16 – 29** | 11 | 9 |
| **30-44** | 14 | 7 |
| **45-59** | 13 | 7 |
| **60-74** | 5 | 2 |
| **75 and older** | - | - |
| **Total: n = 68** | 43 | 25 |

The next stage of our research was to study the nature of tumor growth, since the manifestation of clinical symptoms depends on this.Table 2 shows the distribution of patients by the nature of the sellar region formation and the type of treatment received.

As can be seen from Table 2, hemorrhage into the pituitary stroma occurred in 6 (8.9%) cases, and of these, it was predominant in patients with NAG – 3 cases (4.4%). Tumor recurrence after TAG occurred in 15 of 67 patients (22.4%), with the most frequent occurrence in NAG – 6 of 15 cases (40%).

**Table 2.**
**Distribution of patients by type of treatment received.**

| Diagnosis of the disease | Number sick | TAG | LT |
|---|---|---|---|
| NAG | 42******!!! | 37 ((((( | 2 |

Note: NAG – inactive pituitary adenoma, TAG – transnasal pituitary adenomectomy, * – relapse of growth, ! – hemorrhage into the stroma, ( – reoperation, RT – number of patients who received radiation therapy, CT – chemotherapy, CT – combination therapy

**Patients with 'endo-suprasellar growth' were characterized by**chiasmatic syndrome, i.e. loss of visual fields: bitemporal hemianopsia,initial left-(or right)-sided homonymous hemianopsia, complete left-(or right)-sided homonymous hemianopsia, scotomas, etc.

Among our patients, this growth pattern was observed in 28 cases (41.1%).

Figure 2 shows MRI and a diagram of abnormalities in endo-laterosellar tumor growth.

For patients in this group, the most characteristic symptoms are decreased visual acuity in one eye, unilateral headaches, and damage to the oculomotor nerves - III, IV, V, VI cranial nerves.

It should be emphasized that the majority of acidophilic cells, which produce GH and prolactin, are typically located in the posterolateral portion of the anterior pituitary gland. Some acidophilic cells produce both GH and prolactin. These are mammosomatotrophic cells.

Given this, the earliest loss of STH should be expected among patients with endo-laterosellar pituitary tumor growth. We observed 9 cases (13.2%).

**For patients withendo-laterosellar growth was characterized by decreased visual acuity in one eye, unilateral headaches, damage to the third, fourth, fifth, sixth cranial nerves**

Patients with endo-supra-infra-retro-ante-laterosellar growth exhibited all of the above-mentioned abnormalities, as well as pyramidal symptoms due to motor tract involvement. We observed 26 cases (38.2%).

Endo-antesellar tumor growth is characterized by disturbances caused by growth into the ethmoid labyrinth and orbit. We observed three cases (4.4%).

**Patients with infrasellar growth were characterized by: impaired nasal breathing and difficulty swallowing.** Patients with this tumor growth pattern are characterized by nasal breathing and swallowing difficulties (dysphagia). We observed two cases (2.9%).

Thus, among our patients with giant inactive pituitary adenomas, the most common type was endo-suprasellar tumor growth - 28(41.1%).observations. In 2nd place were variants with total growth - 26 cases (38.2%), in 3rd place - with endo-laterosellar tumor growth - 9 observations (13.2%). The least common were endo-anterosellar (growth into the brain) and endo-infrarosellar tumor growth - 3/2 cases, respectively, or (4.4%)./(2.9%).

Table 3 provides a comparison of clinical symptoms depending on the nature of tumor growth.

**Table 3.**
**Comparison of clinical symptoms depending on the nature of tumor growth(n=68) abs (%)**

| Violations | Total tumor growth N=26 | Suprasellar tumor growth N=28 | Endo-laterosellar tumor growth N=9 | Endo-antesellar growth tumors N=3 | Endo-infrasellar tumor growth N=2 |
|---|---|---|---|---|---|
| Bitemporal hemianopsia | 20 (79.9%) | 25 (89.3%) | - | - | - |
| Bilateral amaurosis | 6 (23%) | 3 (10.7%) | - | - | - |
| Diencephalic-brainstem symptoms | 13 (50%) | - | 9(100%) | 5 (100%) | - |
| Neuroendocrine disorders | 26 (100%) | 26 (92.8%) | - | 1 (20%) | - |
| General cerebral symptoms | 18 (69%) | - | - | 5 (100%) | 1 (50%) |
| Defeat of the cranial nerve III, IV, V, VI pairs | 15 (57.6%) | - | 9(100%) | - | - |
| Symptoms of oral automatism, Babinski's syndrome | 12 (46.1%) | - | 7 (77.8%) | 5 (100%) | - |

Note: CN – cranial nerves

As can be seen from Table 3, the most pronounced visual field disturbances in the form of amaurosis and bitemporal hemianopsia were observed in patients with endo-suprasellar growth – amaurosis(10.7%), bitemporal hemianopsia(89.3%), as well as in the case of a total growth variant – amaurosis(23%), bitemporal hemianopsia(79.9%)Comparative characteristics of patients showed thatPatients with giant pituitary adenomas exhibited pronounced neuroendocrine, neurological, and ophthalmological abnormalities. Neuroendocrine (GHR, panhypopituitarism, hypopituitarism, infertility, secondary amenorrhea) and ophthalmological (bitemporal hemianopsia, amaurosis, etc.) abnormalities were characteristic of total tumor growth and suprasellar growth. Diencephalic-brainstem abnormalities (pyramidal symptoms, diffusely decreased reflexes and muscle tone) were observed in patients with total tumor growth, retrosellar growth, and brain invasion. Patients with giant pituitary adenomas primarily exhibited decreased levels of STH, FSH, LH, and ACTH (47%), i.e., panhypopituitarism accompanied by general cerebral and brainstem symptoms.

It should be emphasized that, in general, patients had a decrease in the average values of pituitary tropic hormones.

Our results showed that all patients with giant pituitary adenomas experience neuroendocrine disturbances to varying degrees, worsening as the pituitary tumor grows. These disturbances include a number of specific (GD, scotomas, hypopituitarism, cranial nerve damage) and nonspecific symptoms (pyramidal symptoms, diffuse decreased muscle tone and reflexes), depending on the tumor's location and size.

**Conclusion.**. 1)The most common type of tumor growth among our patients with giant inactive pituitary adenomas was endo-suprasellar tumor growth -28(41.1%).observations.2)The most pronounced visual field disturbances in the form of amaurosis and bitemporal hemianopsia were observed in patients with endo-suprasellar growth – amaurosis(10.7%), bitemporal hemianopsia(89.3%), as well as in the case of a total growth variant – amaurosis(23%), bitemporal hemianopsia(79.9%), 3) The most pronounced neurological disorders in the form ofdiencephalic-stem disorders (pyramidal symptoms, decreased reflexes and diffuse muscle tone) were observed in patients with a total growth variant, with retrosellar growth and with invasion into the brain

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