Pituitary tumor

History

The history of pituitary pathology is a long one that dates back to biblical times, but the last 25 years have represented an era of “coming of age.” The role of the pituitary in health and disease was the subject of many studies over the last century. With the development of electron microscopy, immunoassays, and immunohistochemistry, the functional alterations associated with pituitary disease have been clarified. The additional information provided by molecular genetic studies has allowed progress in understanding the pathogenesis of pituitary disorders. Nevertheless, many questions remain to be answered. For example, pathologists cannot morphologically distinguish locally aggressive pituitary adenomas from carcinomas when tumor is confined to the sella. Sadly, basal cell carcinoma, the most common carcinoma of skin, usually causes less morbidity than pituitary adenomas, which occur in almost 20% of the general population, can cause significant illness and even death, and yet are still classified as benign. The opportunity to increase awareness of the impact of these common lesions on quality of life is the current challenge for physicians and patients.

Ongoing multidisciplinary approaches to pituitary disease research will offer new insights into diseases arising from the pituitary.

Classification

Pathogenesis

The pathogenesis of pituitary tumors (PT) is unclear. Deregulation of apoptosis is one of the factors involving tumor growth.

In a study, pituitary tumor (PT) samples were collected from 20 patients after surgery. The expression of Histone deacetylases (HDAC) and p53 was analyzed in the PT samples. PT cell line, AtT-20 cells, was cultured to test the role of HDAC in the regulation of apoptosis in PT cells. The results showed that the high levels of HDAC11 and lower levels of p53 were detected in PT. A negative correlation was detected between the data of HDAC11 and p53. A complex of HDAC11 and HEY1, the gene transcription factor of p53, was detected in the PT cells. Less acetylated HEY1 was found in the PT cells. In addition, lower levels of HEY1 and the gene transcription activities were detected at the PT53 promoter locus. This phenomenon was mimicked by over expression of HDAC11 in AtT-20 cells. Knockdown of HDAC11 enhanced the p53 expression in AtT-20 cells. In conclusion, HDAC11 interferes with p53 expression in PT cells. The fact suggests that inhibition of HDAC11 has therapeutic potential in the treatment of PT.

Clinical features

Diagnosis

Improved imaging techniques have contributed to increased diagnosis of pituitary tumors.
On the MRI they can present various enhancement patterns and other imaging features. About 18% of macroadenomas contain cystic components, about 20% show foci of hemorrhage, which are usually clinically asymptomatic and diagnosed incidentally in MR imaging.

**Differential Diagnosis**

Calcifications in pituitary adenomas are reported in 0.2–8% of cases.

Therefore pituitary adenomas may be mimicked by other tumors located in the sellar region

Although MRI is the imaging study of choice for evaluation of sellar lesion or in the context of known or highly suspected pathology, the MR appearance of different sellar/parasellar lesions may be very similar, which often leads to misdiagnosis.

While the most common cause of a pituitary mass is an adenoma, the differential diagnosis is broad and includes

- Tuberculum sellae meningioma
- Craniopharyngioma
- Rathke cleft cyst
- Metastases
- Gliomas
- Abscess, as well as uncommon types of sellar/parasellar tumors like hemangioblastoma.
- Pituitary hyperplasia
- Lymphocytic hypophysitis
- Pituitary adenoma.
- Neurohypophyseal tumors are rare.

The term atypical adenoma (APA) was revised in the old 2004 World Health Organization (WHO) classification of pituitary tumors.

**Treatment**

For the treatment of pituitary tumors, microscopic transsphenoidal surgery has been considered the “gold standard” since the late 1960s. Over the last two decades, however, a worldwide shift towards endoscopic endonasal surgery is in progress for many reasons. These include a wide panoramic view, improved illumination, an ability to look around anatomical corners using angled tip and, in addition, application to the extended approaches for parasellar lesions. Both endoscopic and microscopic approaches appear equally effective for Clinically nonfunctioning pituitary macroadenomas without significant suprasellar or lateral extensions, whereas the endoscopic approach may improve outcomes associated with the extent of resection and postoperative complications for larger tumors. Despite many theoretical benefits in the endoscopic surgery, remission rates of functioning adenomas do not substantially differ between the approaches in experienced hands. The endoscopic approach is a valid alternative to the microscopic approach for adenomas. The benefits will be more appreciated
in the extended surgery for parasellar tumors

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