

Evaluation of Pituitary Adenomas

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Pathophysiology

The most common type of pituitary mass is an adenoma. A microadenoma is less than 1cm in diameter while a macroadenoma is larger than 1 cm. Adenomas fall into two categories, secreting and non-secreting adenomas. Most adenomas are non-secreting tumors and cause problems by compressing important structures nearby such as the pituitary gland (resulting in hormone disturbances) and the optic chiasm (with resultant visual loss). Secreting adenomas may be discovered via endocrinologic abnormalities, most commonly galactorrhea or infertility in the case of prolactin secreting tumors (prolactinomas) or gonadotrophin secreting tumors (gonadotrophin release factors). Rarely, pituitary adenomas can be malignant (less than 3%).

Presentation

Patients may present with loss of their peripheral vision, galactorrhea, infertility, or acromegaly. Endocrine disturbances can be vague and full work up must be attempted to define the disorder.

More commonly, the pituitary adenoma may be found incidentally on a brain scan performed for an unrelated indication such as headache, dizziness or trauma.

Differential diagnosis

Pituitary lesions can sometimes be other tumors such as craniopharyngiomas, Rathke's cyst, arachnoid cyst, germinoma or meningiomas. Metastatic carcinoma can also present as a pituitary lesion. Non-neoplastic lesions such as infections or aneurysms can also present as a pituitary mass and can create compression which can affect vision or decrease hormone production of the pituitary gland.

Diagnosis and Work up

A formal pituitary lesion work up always includes a comprehensive endocrinological panel consisting of prolactin, cortisol, ACTH, TSH, T4, LH, FSH, GnRH, IGF1, growth hormone etc. Usually a referral to an endocrinologist is warranted since postoperative management of hormone status and supplementation may be required.

Formal visual examination (Goldman Visual Field Examination) by an Ophthalmologist is also recommended before and after treatment, especially if the patient has visual loss prior to treatment.

MRI brain with sellar protocol with and without contrast allows for high definition visualization of pertinent anatomy.

Consultation with neurosurgery is usually required for surgical options. The neurosurgeon will usually call in an ENT surgeon for assistance with the surgery. Rarely is an oncology consultation required.

Treatment

Small pituitary tumors <1 cm without symptoms can be followed with MRIs. If no significant growth is observed over a 10 year period, then the patient may be discharged.

Treatment options for prolactinoma start with dopamine agonists such as cabergolin (Dostinex) and Bromocriptine, which can completely resolve the tumor. Growth hormone secreting adenomas can be treated with somatostatin analogs such as octreotide. Conventional chemotherapy is not the first line for adenomas. Radiation is not usually offered before surgery.

Recurrent or refractory prolactinomas and adenomas are treated primarily through surgical resection. Endoscopic approaches through the nose in a joint surgery between a neurosurgeon and an ENT surgeon. Opening up the sphenoidal sinus in the back of the nose allows access to the sella turcica where the pituitary tumors are located at the base of the brain. The tumor is resected through the nose. Risks include CSF leak, injury to cavernous sinus and cavernous carotid arteries and loss of pituitary hormone function. Post-operative care is performed in the ICU and careful study of the patient's serum sodium levels, urine output and urine specific gravity allows for treatment of postoperative diabetes insipidus, caused from surgical manipulation of the hypothalamus and the resultant ADH deficits.

Residual or recurrent tumors may be treated by surgical reexploration. External beam radiation treatment may also be an option after surgery. Follow up MRIs are performed for up to 10 years after surgery.

Outcome

Ten year tumor free progression can be up to 94%. Stable patients usually do not require MRI follow up after 10 years.