

Endocrinological Evaluation of Pituitary Masses



This department covers selected points from the 2009 Endocrine Update: A CME Day from the Division of Endocrinology and Metabolism at McMaster University and the University of Western Ontario.
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Micro- (< 1 cm in size) and macroadenomas (> 1 cm in size) constitute up to 90% of the pituitary masses. Macroadenomas are present in 0.2% of the general population and present with three major clinical manifestations including:

- local mass effects,
- hormonal hyperfunction and
- hormonal hypofunction.

Evaluation of sellar masses requires imaging studies, neuro-ophthalmological (visual fields)

and hormonal assessment. The hormonal manifestations are a result of either pituitary insufficiency, in the majority cases, or hormonal overproduction.

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Table 1

Hormonal insufficiency


Insufficiency type	Symptoms	Diagnosis	Therapy
Adrenal insufficiency	Fatigue, anorexia, weight loss and also vascular collapse in severe cases	Fasting cortisol (< 100 nmol/L confirms diagnosis) or stimulation test	Glucocorticoids (hydrocortisone or prednisone)
Hypothyroidism	Fatigue, lethargy, cold intolerance, decreased appetite, bradycardia, delayed relaxation deep tendon reflexes	Free T4 and Free T3 required in addition to TSH (TSH alone is insufficient)	Levothyroxine (do not start until adrenal insufficiency has been ruled out or treated)
Hypogonadism	Women: anovulation, infertility, decreased libido, low BMD Men: decreased energy, libido and low BMD	Low estradiol (women) or low morning testosterone (men) in combination with low or inappropriately normal LH and FSH	Women: birth control pill or hormone replacement therapy Men: testosterone
Growth hormone (GH) deficiency	Decreased muscle mass, endurance, well-being and BMD	Low IGF-1 and stimulation test	For severe deficiency: GH therapy

Table 2

Hormonal overproduction

Condition/hormone	Symptoms	Diagnosis	Therapy
Cushing's syndrome (overproduction cortisol, usually due to pituitary ACTH overproduction)	Proximal muscle weakness, hypertension, edema, striae, plethora, central obesity, depression, decreased BMD	24 hour urinary cortisol excretion, 1 mg overnight dexamethasone suppression test, midnight saliva cortisol	Surgery
Acromegaly (overproduction of GH)	Acral overgrowth, jaw malocclusion, oiliness of the skin, hypertension, glucose intolerance, cardiomyopathy, visceromegaly	IGF-1, glucose tolerance test	Surgery, somatostatin analogues, growth hormone receptor antagonists, radiotherapy
Hyperprolactinemia (most common)	Women: oligomenorrhea, galactorrhea, infertility Men: decreased libido, impotence, osteopenia	Serum prolactin	Dopamine-agonists (for prolactinomas, not for pituitary stalk compression)

LH: Luteinizing hormone
 FSH: Follicle stimulating hormone
 IGF-1: Insulin-like growth factor 1
 ACTH: Adrenocorticotrophic hormone

Endocrine evaluation of a sellar mass is required to diagnose and treat hormone deficiencies (Table 1) or overproduction (Table 2). This helps to better prepare the patient for surgery and to determine the goal of surgery. Follow-up by an endocrinologist, neuro-ophthalmologist and with imaging studies is important. 

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