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Endocrinology Quiz – Case 9

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A 70-year-old man with a history of type 2 diabetes, hypertension, peripheral vascular disease and iliac artery angioplasty was referred by his general practitioner with loss of libido and erectile dysfunction associated with a serum testosterone of 1.7 nmoL/L (reference range: 10.0–28.0 nmoL/L). He had no other symptoms of androgen deficiency like reduced feeling of well-being, fatigue, impaired mood, reduced body hair growth. There were also no symptoms of headaches, visual disturbances, galactorrhea or other pituitary disease. His clinical examination was unremarkable apart from elevated body mass index (BMI) of 39.9 kg/m^2. His secondary sexual characters were well developed. A morning pituitary profile confirmed hypogonadism with a serum testosterone of 2.7 nmoL/L with sex hormone binding globulin (SHBG) of 13 mmoL/L (13–71 nmoL/L), luteinising hormone (LH) of 5.0 IU/L (2.0–9.0 IU/L) and follicle stimulating hormone (FSH) of 7.3 IU/L (2.0–12.0 IU/L). The mean of three serum prolactin measurements was 6731.3 mU/L (86–324 mU/L); macroprolactin screening was negative. The rest of the pituitary profile was normal. A pituitary magnetic resonance imaging (MRI) scan showed an adenoma (fig. 1A). He was commenced on cabergoline. Follow-up attendance was irregular; however, he eventually achieved consistently low prolactin levels of 7–19 mU/L. Despite increase in gonadotrophins to supra-physiological levels (LH 32.2–35.9 U/L and FSH 29.5–31.6 IU/L), testosterone levels failed to recover completely (5.3–7.2 nmoL/L). There was no history of testicular infection or trauma and testicular volumes were 10–12 mL. Bone densitometry showed osteopenia. A diagnosis of primary hypogonadism was made, and he was commenced on testos-

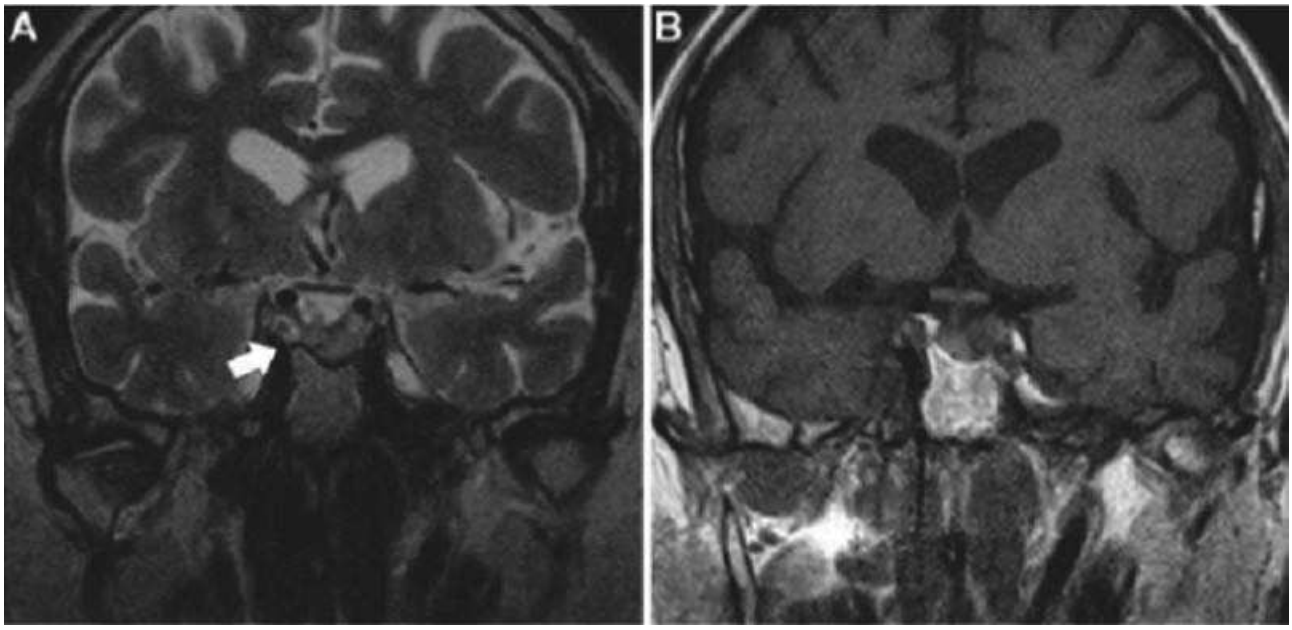

Figure 1. Magnetic resonance imaging (MRI) demonstrated a 10 mm pituitary adenoma (arrow) on coronal T2-weighted imaging at first presentation (A). The adenoma reduced significantly in size with dopamine agonist treatment on the follow-up T1-weighted imaging 6 years later (B).

terone treatment following which the serum testosterone and gonadotrophin levels recovered. A follow-up MRI scan showed reduction in the size of the pituitary adenoma (fig. 1B).

Comment

Prolactinomas, the most frequent of pituitary adenomas, are commonly associated with secondary, hypogonadotrophic hypogonadism in both sexes due to inhibition of pulsatile secretion of gonadotrophin-releasing hormone by the high prolactin levels. In men, the consequent testosterone deficiency can present with sexual dysfunction. Correction of hyperprolactinemia with dopamine agonists such as cabergoline (the most commonly used agent), bromocriptine and quinagolide, or rarely pituitary surgery, usually leads to recovery of gonadal and sexual function. Testosterone levels failed to normalize entirely in our patient despite recovery and rise of gonadotrophins to supra-physiological levels, revealing a biochemical picture of hypergonadotrophic hypogonadism characteristic of primary testicular failure. Acquired primary hypogonadism can be idiopathic or result from testicular trauma, infection (e.g. mumps orchitis), torsion, tumor or drugs (e.g. glucocorticoids, alkylating agents and ketoconazole), radiation and orchidectomy. Atherosclerotic disease, as in our patient, may be another cause. Also, male obesity-associated secondary hypogonadism (MOSH) was also considered albeit this condition appears to induce more of a secondary, rather than primary, hypogonadism, albeit the link between obesity with/without type 2 diabetes mellitus and diabetes is complex.

Testosterone replacement treatment is recommended as untreated male hypogonadism can cause sexual dysfunction, infertility, fatigue, loss of well-being, anemia, osteoporosis, and decreased lean body mass and muscle strength, as well as increased fat mass and visceral adiposity, which may be associated with metabolic dysfunction. Most widely used testosterone formulations include topical gels and intramuscular injections, whereas as buccal or oral tablets/capsules and depot subcutaneous implants are also available in some countries. As testosterone treatment can be associated with erythrocytosis and prostatic hyperplasia, regular monitoring of hematocrit and prostate-specific antigen levels is recommended.

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