

Pituitary masses: the importance of a multidisciplinary approach

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Why all patients with a pituitary mass need to be seen by an endocrinologist

For the average general practitioner, pituitary disorders are relatively uncommon. However, post-mortem and magnetic resonance imaging (MRI) studies show that about 10% of the population may harbour a pituitary mass, although most are small, non-functioning microadenomas.¹ Pituitary adenomas are the commonest intracranial neoplasm, making up about 10%–15% of such lesions.² In most large series, prolactinomas are the most prevalent subtype, at between 40% and 50%; non-functioning adenomas account for about 30%, with other functioning adenomas (secreting growth hormone, causing acromegaly; secreting adrenocorticotrophic hormone, causing Cushing's disease; or secreting glycoprotein hormones, such as intact follicle-stimulating hormone, luteinising hormone and thyroid-stimulating hormone) making up the remainder.³

We would like to put forward the view that the endocrinologist should be the key practitioner in a multidisciplinary approach to pituitary masses. Within the Australian health system, most patients in whom a pituitary mass is discovered are referred directly to a neurosurgeon. Many non-endocrinologists making such referrals do not realise the critical importance of the neurosurgeon's specific pituitary surgical experience in patient outcome. Initial assessment of a patient with pituitary disease includes differential diagnosis, making decisions regarding necessity for surgical intervention, and medical management, including correction of any underlying hypopituitarism or hormone excess. On occasion, an endocrinologist may detect subtle variations in a patient's presentation that can significantly alter management. Therefore, we encourage practitioners to refer patients initially to an established multidisciplinary pituitary team using a shared management approach — a team in which an endocrinologist works in conjunction with a pituitary neurosurgeon. Other relevant health professionals may include a neuroradiologist, ophthalmologist and radiation oncologist. Such teamwork can ensure optimal benefits for patients at all stages of management.

With respect to functioning adenomas, most prolactinomas do not require surgery, even when a significant visual field defect is present. Mild increases in serum prolactin levels can be seen with some non-functioning pituitary lesions because of the interruption of dopamine delivery down the pituitary stalk. A level elevated more than 10-fold has traditionally been diagnostic of prolactinoma, for which the initial management should, in most circumstances, be with dopamine agonists.⁴ More recent evidence indicates that, for about 99% of histologically confirmed non-functioning adenomas, the serum prolactin level can be up to 2000 mIU/L; the authors of that article recommended a trial of dopamine agonist in patients with a macroadenoma and serum prolactin levels of more than 2000 mIU/L.⁵

There are tumours that secrete enough adrenocorticotrophic hormone or growth hormone to produce only subtle clinical features of Cushing's syndrome or acromegaly, respectively. Because the perioperative management of a patient with Cushing's disease and acromegaly differs from the management of a patient with a non-functioning mass, it is important to detect these cases

of subclinical pituitary hypersecretion before surgery, so the correct functional diagnosis is made from the outset.⁶ This also gives the endocrinologist the opportunity to use medical therapies such as somatostatin receptor analogues in the pre- or postoperative setting where appropriate.

Patients with hypopituitarism benefit from hormone replacement.⁷ Although giant, vision-threatening tumours do occur, most cases do not generally require emergency surgical intervention, so there is time, in consultation with the neurosurgeon, for adequate assessment and stabilisation of the patient's hormone state before surgery. Patients with clear hypopituitarism should begin taking maintenance doses of glucocorticoid and thyroxine before surgery. Sex steroid replacement can be delayed until after postoperative assessment. Successful resection of a macroadenoma may result in reversal of the hypopituitarism.⁸ Appropriately timed postoperative pituitary function testing and correct interpretation of the results is required for optimal outcome.

Not all pituitary or suprasellar masses are pituitary adenomas. Sometimes characteristics on MRI can distinguish between the other various causes.⁹ The presence of diabetes insipidus is a strong clue that the mass is not a pituitary adenoma.⁷ Inflammatory (eg, Langerhans' cell histiocytosis and lymphocytic hypophysitis) and other neoplastic lesions (eg, craniopharyngioma and germinoma) are commonly associated with diabetes insipidus, whereas it is very rare for an uncomplicated pituitary adenoma to present in this way. Preoperative recognition of non-adenomatous lesions may alter management. For example, lymphocytic hypophysitis often responds to high doses of glucocorticoids, even when a large mass with visual field compromise exists;¹⁰ Langerhans' cell histiocytosis responds well to low-dose radiotherapy;¹¹ and germinomas, which may be associated with increased serum or cerebrospinal fluid β -human chorionic gonadotropin levels, are best treated with a combination of chemotherapy and radiotherapy.¹² With a collaborative, multidisciplinary approach to patient care, the endocrinologist can evaluate the likely differential diagnosis, in conjunction with the pituitary neurosurgeon and neuroradiologist, relevant investigations can then be performed, and a collective decision can be made on the most appropriate management for each particular patient.

Trans-sphenoidal pituitary surgery is a highly specialised procedure, and it is clear from published data that the experience and skill of the neurosurgeon is of paramount importance in determining outcome, particularly for secretory lesions. A review from the United States showed that higher surgical volume is associated with significantly reduced mortality, fewer complications and a reduced length of hospital stay.¹³ The best results were achieved by units where more than 25 patients were operated on per year.¹³ It has been estimated in the United Kingdom that only one pituitary neurosurgeon is needed for each five million of population.¹⁴ In a country such as Australia, it would seem pragmatic to have a small number of specialised neurosurgeons who do virtually all the pituitary surgery. However, such a scenario seems a long way off and would be fraught with political, personal and inter-hospital

rivalries. Nevertheless, informal management networks can be forged by altering referral patterns. In Birmingham, UK, the cure rate for acromegaly almost doubled when the endocrinologists sent all their patients to one neurosurgeon, compared with when eight neurosurgeons in the city were performing pituitary surgery.¹⁵ This is another key reason why we believe referrals for patients with pituitary masses would be best directed to an established multidisciplinary team involving, as two key members, an endocrinologist with primary responsibility for pre- and postoperative assessment, and an experienced pituitary neurosurgeon.

Pituitary masses are the commonest intracranial neoplasm. The initial point of referral should be an endocrinologist within an established multidisciplinary team. We are aware that a number of teaching hospitals in the major Australian cities have developed considerable expertise in the multidisciplinary management of pituitary lesions. In our opinion, this approach provides a high standard of care and contributes to the ongoing training experience of endocrinology and neurosurgery registrars. We believe patients who wish to be cared for in the private sector would also benefit from being managed jointly by an endocrinologist and a specialised pituitary neurosurgeon, if not by a full multidisciplinary team.

Competing interests

Warrick Inder has received speaker's honoraria from Novartis Oncology and travel assistance from Novartis and Ipsen, both manufacturers of somatostatin analogues. He has also served on an advisory board for Pfizer regarding pegvisomant and human growth hormone.

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