Drs. Buatti and Marcus concisely review the clinical presentation, diagnosis, and current management of pituitary adenomas. It would be difficult, if not impossible, for a brief review article to cover in depth all of the areas of controversy for such a broad subject. Consequently, several supplementary comments are in order.

**Medical Management**

Drs. Buatti and Marcus do not elaborate very much on the successes of medical therapy for functional pituitary adenomas. Despite the drawbacks they correctly point out, most endocrinologists presently choose dopamine agonist therapy (e.g., bromocriptine [Parlodel], pergolide [Permax]) as the first line of therapy for prolactinomas.

A review of 271 patients with macroprolactinoma treated in 26 studies found that 79% of tumors shrink by 25% or more with dopaminergic treatment.\(^1\,^2\) The amount of shrinkage increases over time, with approximately 86% of tumors decreasing by more than 50% after 1 year of therapy.\(^1\) The advantages of waiting for further shrinkage of a macroadenoma before performing surgery must be weighed against the possibility that resection may become more difficult after lengthy dopaminergic treatment.\(^1\)

Medical control of acromegaly is less successful than that of prolactinomas, and therefore is usually not the primary therapy of choice. Bromocriptine lowers growth hormone levels in an average of 74% of patients but almost never below 2.5 mcg/mL. Somatostatin analogs (octreotide [Sandostatin]) decrease growth hormone levels in about 94% of patients, but, on average, only 21% achieve normalization of growth hormone.\(^3\) Tumors shrink in an average of 35% of patients treated but usually by less than 50%.\(^3\)

Medical therapy has also been tested in clinically nonfunctional pituitary adenomas. Approximately 20% of these tumors shrink with bromocriptine therapy.\(^4\) Medical therapy is therefore a reasonable option for patients with clinically nonfunctional pituitary adenomas who have not responded to radiotherapy and who are poor candidates for surgical resection.

**Surgical Resection**

One recent surgical advance that deserves mention is the development of minimally invasive transnasal endoscopic techniques for pituitary surgery.\(^5\,^6\) These procedures promise to reduce the morbidity of surgery to even lower levels than are achievable with transsphenoidal hypophysectomy. The majority of patients can be discharged within 1 day after transnasal endoscopic surgery.\(^5\,^6\) The low morbidity of modern neurosurgical techniques weakens the argument for skipping tissue diagnosis and proceeding with empiric radiotherapy in many patients with suspected pituitary adenoma.

**Radiotherapy**

Buatti and Marcus correctly state that radiotherapy to 45 Gy "can produce cure in more than 90% of cases." This seems difficult to reconcile with their statement that surgery is the treatment of choice, and may lead unfamiliar readers into thinking that radiotherapy is more effective than it actually is. Although some centers have reported long-term control rates of this magnitude with radiation therapy, other large series have reported 20-year actuarial tumor control rates of only 72% to 76%.\(^7\,^8\) The lower cure rates at these centers cannot be explained by differences in dose or technique.\(^7\,^8\)

The use of radiation doses more than 45 Gy in 25 fractions for nonfunctional tumors increases the
risks of complications without improving tumor control.[7,8] Management of pituitary adenomas that progress after radiotherapy can be particularly vexing.[8,10] Finally, even the most optimistic reports on functional pituitary adenomas require 15 years of follow-up before hormone normalization rates reach 90%.[11] The morbidity and mortality of uncontrolled Cushing's disease or acromegaly are too great to wait 10 to 15 years for hormone normalization after radiotherapy alone. For this reason, multimodality treatment is the norm for these tumors.

**Radiosurgery and Stereotactic Radiotherapy**

Radiosurgery and stereotactic radiotherapy are recent techniques that show a great deal of promise in the management of pituitary adenomas. Dose escalation (possible with optic pathway doses less than 8 Gy) can potentially increase tumor control while improving the likelihood and speed of reaching hormone normalization for secretory tumors. Compared with conventional fractionated radiotherapy, the ability of radiosurgery and stereotactic radiotherapy to treat smaller tumor volumes can potentially reduce the chances of hypopituitarism, second tumor development, and injury to the brain or cranial nerves.

Since diagnostic imaging of pituitary tumors is not yet perfect, one possible drawback of treating smaller image-defined tumor volumes is the small likelihood of missing an unseen area of tumor extension. Because of the long natural history of pituitary adenomas, long-term studies are still needed to adequately assess the merits of radiosurgery and stereotactic radiotherapy relative to conventional radiotherapy and surgery.

**Multidisciplinary Management**

Pituitary adenomas are optimally managed by a multidisciplinary team of neurosurgeons, endocrinologists, radiation oncologists, and other specialists. Cooperation among the team members is essential for applying new developments from clinical and laboratory research in diagnostic imaging, surgery, radiation oncology, pharmacology, pathology, and molecular biology to optimize care for individual patients. Also, careful cost-effectiveness analyses are needed to better define the merits of different therapeutic strategies in these patients.

**References:**


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