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Rapid Shrinkage of a Prolactin-Secreting Pituitary Tumor with Bromocriptine: CT Documentation

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Prolactin-secreting pituitary tumors are now recognized as a common endocrinologic problem [1]. Bromocriptine is an ergot alkaloid which, by virtue of its agonist action at the dopamine receptor, is effective in lowering serum prolactin levels [2]. Although a number of reports have shown reduction in tumor size with bromocriptine therapy [3–8], documentation of rapid regression of tumor size is limited [9]. We describe a prolactinoma patient in whom bromocriptine therapy resulted in rapid reduction in tumor size.

Case Report

A 42-year-old man was well until he was involved in an automobile accident. Emergency department radiography showed no fractures, however, a markedly enlarged sella turcica was noted on lateral skull radiography. Further evaluation included computed tomography (CT) of the head with intravenous contrast enhancement, which demonstrated the presence of a large pituitary tumor with extension above, behind, and lateral to the sella turcica (figs. 1A and 1B). Endocrine evaluation showed a serum prolactin concentration of 1,600 ng/ml without other hormonal abnormalities. Visual field testing was normal and the patient was asymptomatic and clinically and chemically euthyroid.

In an attempt to reduce tumor size, 2.5 mg of bromocriptine was administered three times a day. The initial volume of the tumor was 48.7 cm^3. Two weeks later, a 31% volumetric reduction in tumor size (to 33.7cm^3) was noted, and, by four weeks, another enhanced CT scan (fig. 1C) showed a 49% volumetric reduction in tumor size (to 24.7 cm^3). Because of these excellent results, medical therapy was continued for 3 months at which time an additional 15% volume loss (to 17 cm^3) was documented. The tumor was now 36% of its initial volume.

We determined by a fifth scan 6 weeks after the previous scan that further tumor shrinkage had not occurred and was unlikely. Thus, surgical excision via a right frontal craniotomy was attempted. Pathology demonstrated a secretory pituitary adenoma. No unusual histologic features were present. The extent of the tumor precluded total excision, and for this reason radiation therapy (5,000 rad [50 Gy]) was used as an adjunct to the surgical and medical treatment. Unfortunately, the patient developed intracranial hypertension with resultant brain stem compression and, despite a decompression procedure, died.

Discussion

Pituitary tumors that secrete prolactin are being discovered with increasing frequency [10]. Although bromocriptine is known to be effective in the cessation of the associated galactorrhea and amenorrhea, its place as a definitive form of therapy and its efficacy in the reduction of tumors remain unclear. Some neurosurgeons have noted that preoperative treatment with bromocriptine allows for better definition of the tumor (from normal tissue) and thereby allows for easier removal [11].

The mechanisms by which bromocriptine decreases tumor size are unknown. It seems to directly inhibit tumor growth and may also affect the vascular supply to the tumor [12]. Regardless of mechanism, early indications are that bromocriptine almost uniformly decreases the size of prolactinomas. McGregor et al. [8] found that five of five patients with such tumors had radiographic (CT) evidence of regression with bromocriptine therapy.

That our patient with such a large tumor was asymptomatic is not so unusual [13]. In men, it seems that microadenomas rapidly progress to large tumors (macroadenomas), whereas microadenomas are far more common in women. Fortunately, prolactinomas in men are relatively rare compared with women. Men who develop a prolactinoma are often hypogonadal and complain of impotence or decreased libido [14]. Our patient denied these symptoms and biochemically had a normal pituitary-gonadal axis.

In the past, pituitary tumor size could be assessed with

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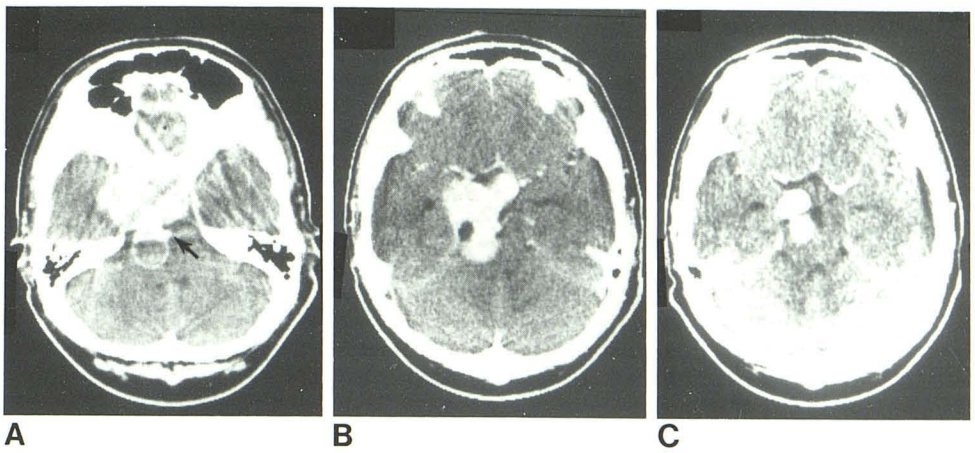

Fig. 1.—**A**, Axial section, 5 mm thick, at level of sella turcica. Lateral extension into right middle fossa, destruction of dorsum sellae, and dorsal extension as cystic lobe impressing or invading pons/mesencephalon junction to right of basilar artery (*arrow*). **B**, Higher section, 5 mm thick, at level of suprasellar cistern. Irregular tumor shape and further mesencephalon invasion or compression. **C**, 4 weeks later, axial section, 5 mm thick, same level as **B**. Dramatic shrinkage of suprasellar extension.

sellar tomography, plain films, and pneumoencephalography. As of now, CT has been shown to be quantitatively the best diagnostic method [15]. CT is ideal for determining the anatomic extent of the tumor and invasion or displacement of adjacent structures. In addition, if a series of contiguous thin slices (in this case, 5 mm thick) and software allowing measurement of the area of a cursor-defined irregularly shaped area of interest are used, total tumor volume can be determined by summation of tumor areas from each slice multiplied by slice thickness. This method is most valuable in the longitudinal follow-up of tumor response, as the volume of an irregular tumor is more accurate than any single diameter in evaluating response. When symptoms such as impending visual loss do not indicate urgent intervention, performance of surgery at the time of maximal medical response may be expected to decrease operative morbidity.

We conclude that preoperative bromocriptine therapy may best be used by objective CT monitoring of tumor response.

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