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Giant Cell Tumor of the Sphenoid Bone Mimicking a Pituitary Tumor

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Case Report

An 18-year-old woman suffered from throbbing occipital headaches for about 11 months before hospitalization. The headaches were initially considered by her family physician to result from migraine and/or sinusitis. The patient noted that the headaches worsened and began to extend to the right temporoparietal area about 6 months before admission, at which time sinus radiographs were reportedly normal. She also began to experience episodes of blurred vision. Several days before admission, the patient developed unrelenting severe headache associated with nausea, vomiting, and blurred vision.

Physical and neurologic examinations at the time of admission were normal except for a mild sensory deficit corresponding to the first and second divisions of the right trigeminal nerve.

Skull radiographs revealed gross destruction of the floor of the sella turcica (fig. 1A). The initial CT study showed a huge soft-tissue mass filling and expanding the sphenoid and posterior ethmoid sinuses. There was no definite evidence of hydrocephalus. Detailed CT examination using transverse and direct coronal sections demonstrated the full extent of the mass, which extended from the sphenoid body posterolaterally into both petrous apices, posteriorly into the clivus, inferiorly to the nasopharynx, and anteriorly as far as the posterior nasal cavity (figs. 1B and 1C). The mass was uncalcified and showed a mild degree of homogeneous contrast enhancement. Cerebral angiography demonstrated lateral displacement of both cavernous internal carotid arteries, tumor encasement of the supraclinoid internal carotid arteries, and a faint tumor blush in the sellar region during the venous phase.

Laboratory evaluation was completely normal, including serum calcium, phosphorus, alkaline phosphorus, and pituitary hormone levels. Preoperatively, the tumor was believed to most likely be a nonsecreting pituitary adenoma of exceptional size and invasiveness.

At open surgical biopsy using a right external ethmoidectomy approach, moderately vascular tumor tissue was encountered just under the lamina papyracea. Histologically, the tumor consisted of a stroma of mononucleated spindle cells that contained numerous benign-appearing giant cells. The histopathologic diagnosis was giant cell tumor of bone.

Discussion

This giant cell tumor probably originated in the body of the sphenoid bone, although it also involved the ethmoid sinuses. There have been 31 previously reported cases of benign giant cell tumor of the sphenoid bone [1–4]. A well

described case of malignant giant cell tumor of the sphenoid wing has also been reported [5]. About 14 reports of giant cell tumor originating in the ethmoid bone have also been published [6].

As with giant cell tumors occurring elsewhere in the skeleton, sphenoid giant cell tumors occur more often in females than in males [1, 3, 4]. The most common symptoms are headache and visual disturbances, especially diplopia [3, 4]. Endocrine disturbances are uncommon [2–4]. Serum calcium and phosphorus levels are normal, as is the alkaline phosphatase level. These determinations help to exclude brown tumor of hyperparathyroidism and giant cell tumor occurring as a complication of Paget disease [7].

The most common reported conventional radiographic and tomographic finding is bone destruction involving the body of the sphenoid bone and the sella, with or without a soft-tissue mass in the sphenoid sinus [3, 4]. Because of the rarity of these lesions, there has been little reported experience with CT of giant cell tumors of the skull and no previous CT description of the sphenoid variety. Enhancement with intravenous contrast material was noted on a 1976 CT scan of an ethmoid giant cell tumor [6]. Two recently reported temporal giant cell tumors both showed contrast enhancement [7]. One of these temporal lesions also contained small calcific flecks and had a prominent cystic component [7]. A combination of axial and coronal CT sections would appear to be ideal for demonstrating both the bone destruction by sphenoid giant cell tumors and any extension into the sphenoid sinus and suprasellar region, information useful in planning a surgical approach for biopsy and therapy. Radionuclide bone scanning is useful to identify or exclude additional lesions or metastases [1, 7].

The radiologic differential diagnosis of sphenoid giant cell tumor includes pituitary adenoma, craniopharyngioma, chordoma, carotid aneurysm, meningioma, and sphenoid mucocele [5]. Endocrinologic evaluation is necessary to exclude invasive prolactin-secreting adenoma, which can produce CT and radiographic findings identical to sphenoid giant cell tumor [8]. Calcification is generally not a feature of giant cell tumors and, when present, would favor chordoma, craniopharyngioma, meningioma, or aneurysm [9]. Parenchymal calcific densities might also suggest fibrous dysplasia, chondrosar-

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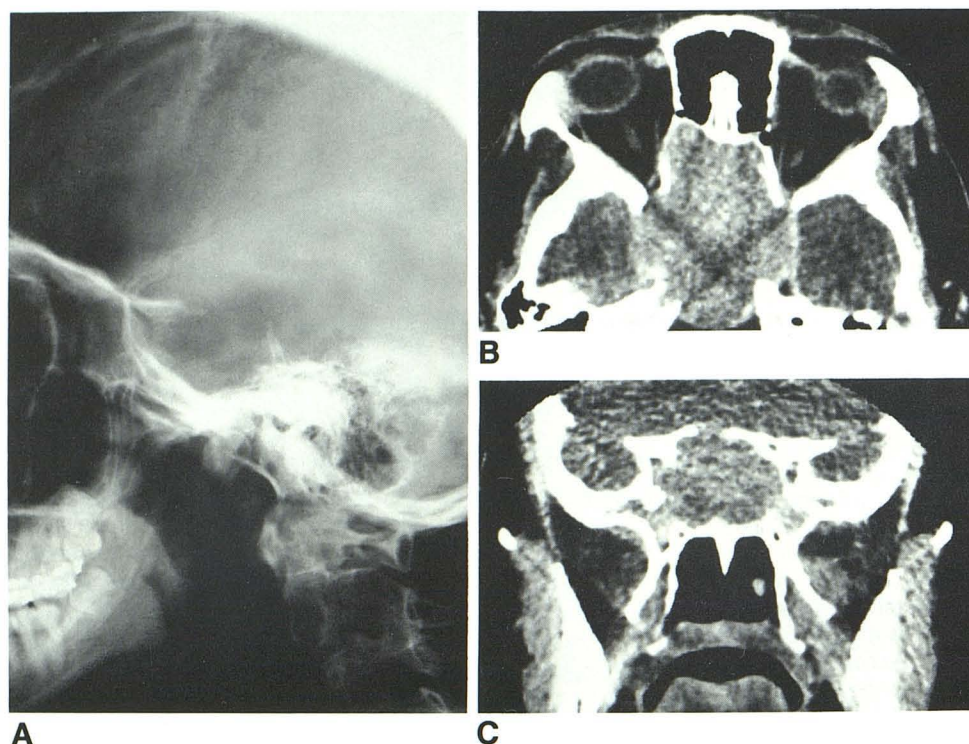


Fig. 1.—A, Lateral skull radiograph. Destruction of floor of sella turcica by giant cell tumor creates appearance of massive sellar enlargement, the most common reported radiographic feature of sphenoid giant cell tumors. Transverse (B) and coronal (C) CT scans after intravenous infusion of contrast material. Centered at sphenoid sinus, tumor has aggressively expanded to fill adjacent ethmoid sinuses and has destroyed portions of planum sphenoidale and petrous portion of temporal bone.

coma, or osteosarcoma. The presence of calcification does not rule out a giant cell tumor, however, as one of two temporal giant cell tumors reported by Epstein et al. [7] contained calcific flecks. Unless thrombosed, an aneurysm could be expected to show greater contrast enhancement with CT than would a giant cell tumor. Mucocoeles typically show either no enhancement with contrast infusion or rim enhancement only [10]. The radiologic features of the sphenoid giant cell tumor in our case could also be produced by invasive nasopharyngeal carcinoma, metastasis, plasmacytoma, sarcomatous meningioma, or a sarcoma of bone. Brown tumors of hyperparathyroidism can mimic giant cell tumors of the skull clinically, radiologically, and histologically, and must be excluded by serum calcium and phosphorus values whenever biopsy reveals a giant cell lesion in this area [11].

Total resection of sphenoid giant cell tumors is not possible in most cases [1, 4, 7]. Management by radical resection of accessible tumor with later local resections to manage tumor recurrences has been advocated [7], as has excision of accessible tumor followed by postoperative radiation therapy [4].

Addendum

Since acceptance of this manuscript, we have become aware of a previously reported sphenoid giant cell tumor with CT findings remarkably similar to ours: Carmody RF, Rickles DJ, Johnson SF. Giant cell tumor of the sphenoid bone. *J Comput Assist Tomogr* 1983;7:370–373.

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