Case Reports

Calvarial Hemangioma: Tumor Stain and Meningeal Artery Blood Supply

Case Report

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Hemangiomas of the calvaria are uncommon lesions, forming approximately 0.2% of all bone neoplasms, and 10% of primary benign neoplasms of the skull. Cerebral angiograms of this lesion are rare. In a recent case, the blood supply to a frontal hemangioma from both the middle meningeal and superficial temporal arteries was demonstrated and is reported here.

Case Report

While a 36-year-old man was being examined for "sinusitis," his physician noticed a swelling on the head. The patient had not previously noted the lump. Other than a few headaches associated with his sinus difficulties, he had no complaints. He was admitted to this hospital.

Examination. Physical examination was normal except for a round firm elevated area, 4 cm. in diameter, behind the hairline over the left frontal bone, just off the midline. The laboratory findings were normal.

Plain skull films (Fig. 1) revealed a 4×4 cm. honeycombed lucent defect in the left frontal bone, with its posterior margin adjacent to the coronal suture and its medial margin extending just across the midline. On tangential laminagrams, numerous spicules of bone were seen radiating away from the outer table, which had small lucent defects within it, while the inner table was intact. Pansinusitis was also noted.

A left cerebral angiogram was then made, using 60% Renografin and serial filming in the anterior-posterior (tangential), half-axial, and lateral projections. There was slight enlargement and increased tortuosity in the superficial temporal and middle meningeal branches of the external carotid artery (Fig. 2), both of which terminated in the midportion of the lesion in the calvarium.

In addition, there was a vascular blush or stain noted, beginning immediately after the appearance of contrast material in the above mentioned vessels and corresponding to the size of the skull lesion (Fig 3). The vessels in this tumor blush were coarser than those seen in meningiomas, and emptied more quickly, disappearing at 3.3 seconds, shortly after the veins had become

Fig. 1. Oblique projection showing "honeycombed" lesion.
densely opacified. The diagnosis given by the Radiology Department was en-plaque meningioma, although hemangioma was considered a possibility.

Operation. A very vascular tumor was found within the bone. The inner table was intact, but bulging inward about 5 mm. The underlying dura was somewhat vascular but in no other way abnormal. The outer table was destroyed in several areas, with marked vascularity adjacent to it, including the scalp. The tumor was removed and a tantalum plate was applied. The post-

Fig. 2. Enlarged superficial temporal and middle meningeal arteries (arrows) extending to the lytic calvarial defect.

Fig. 3. Close-up of lateral projection of mid-arterial phase, showing coarse vascular stain in the lytic calvarial defect.
operative course was uneventful. A postoperative radiograph of the removed bone showed the classic picture of calvarial hemangioma.

**Pathological Findings.** Sections showed replacement of portions of medullary bone with blood containing endothelial lined spaces. No periosteal new bone was seen. The histologic picture was that of hemangioma.

**Discussion**

The roentgenographic appearance of calvarial hemangioma is described as diagnostic, in that a lytic lesion with a “honey-combed” central portion is seen which shows radial striations if viewed in profile. An occasional lesion, however, will closely mimic a meningioma, particularly one which extends through the outer table with development of spiculation of bone and acquisition of additional blood supply from the scalp vessels. The demonstration of both middle meningeal and superficial temporal artery feeding branches in this case, suggests the diagnosis of meningioma, although the plain film changes are characteristic of calvarial hemangioma.

Little seems to be known about the appearance of the vascular stain in these lesions. As in meningiomas, the coarse stain appears early in the angiographic sequence. The blush characteristic of a meningioma is visualized quite far into the venous phase. The early disappearance of the blush should therefore exclude diagnosis of meningioma.

**Summary**

We have reported a case of calvarial hemangioma in which cerebral angiography demonstrated the blood supply from meningeal and scalp vessels as well as a characteristic tumor stain.

**References**