RADIONUCLIDE CEREBRAL ANGIOGRAPHIC EVALUATION OF A DIPLOIC EXTRACRANIAL MENINGIOMA: CASE REPORT

E. W. Klein, S. M. Farhat, P. A. Hoskins, and J. T. Colvin

St. Joseph Mercy Hospital, Ann Arbor, Michigan

A case of a diploic extracranial meningioma whose true vascularity was more significantly defined by radionuclide angiography than by selective contrast angiography is presented. The radionuclide angiogram clearly demonstrated large venous channels draining the tumor.

Dynamic radionuclide angiography has proven beneficial in the evaluation of cervical and cranial abnormalities (*1–5*). An unusual case of extension of a meningioma extracranially proved interesting and it was possible to diagnose correctly the histopathology of the lesion by radionuclide angiography. Clear definition of two large venous channels emanating from the tumor mass was characteristically important for the diagnosis.

CASE REPORT

A 66-year-old woman had struck her head but had not lost consciousness. Approximately 1 month later she noted nontender swelling in the right parietal area. There were no associated symptoms or abnormal neurologic findings. The mass (about 6 cm in diameter) was firm and partially fixed. A ^{99m}Tc-pertechnetate brain scan (Fig. 1) demonstrated abnormal concentration of activity in an area that corresponded to an osteolytic lesion of the calvarium (Fig. 2) and to the fluctuant soft-tissue mass.

The radionuclide cerebral angiogram showed rapid filling of the tumor mass in the initial phase through both the internal and external carotid systems. Although the lesion remained well defined throughout the sequential framing, there was decreased radioactivity 9 sec after initial filling. The sequential imaging revealed two clearly defined venous channels that drained from the inferior border of the tumor mass, joined the engorged and enlarged diploic veins, and ultimately drained into the right transverse sinus (Fig. 3). The radionuclide angiogram suggested an arterial venous malformation, but the slowed venous

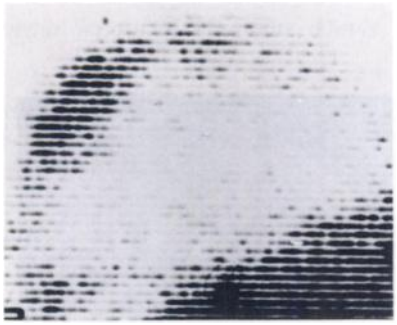

FIG. 1. Right lateral scan demonstrates increased activity in right posterior parietal region.

FIG. 2. Osteolytic lesion of calvarium with increased vascularity in region of deficit. Arrows point to subsequently proven venous channels.

drainage of the lesion, the two large venous channels, and the findings in skull radiographs indicated that the diagnosis of meningioma seemed a highly probable one.

Selective right internal and external carotid angiograms were suggestive of a destructive meningioma although the vascular pattern was not as striking as that seen on the radionuclide angiogram (Figs.

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For reprints contact: Jeffrey T. Colvin, Dept. of Nuclear Medicine, St. Joseph Mercy Hospital, 326 N. Ingalls St., Ann Arbor, Mich. 48104.

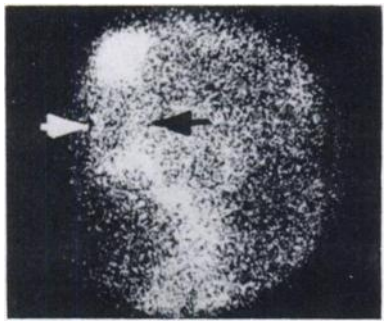

FIG. 3. Right lateral radionuclide angiogram. After injection of bolus of ^{99m}Tc-pertechnetate 16–19-sec frame reveals two venous channels (arrows) that drain into right transverse sinus from tumor.

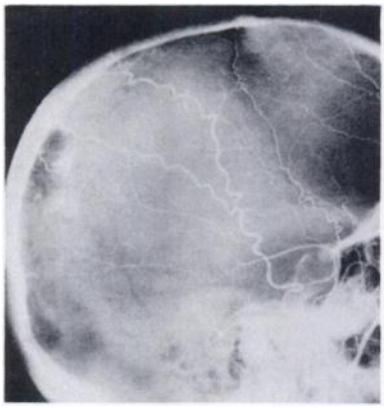

FIG. 4. Selective right external carotid angiogram suggests destructive meningioma (left) but does not show striking vascular pattern seen in radionuclide cerebral flow study (Fig. 3). Internal carotid angiogram demonstrates that tumor is fed to minimal degree from internal carotid vessels (right).

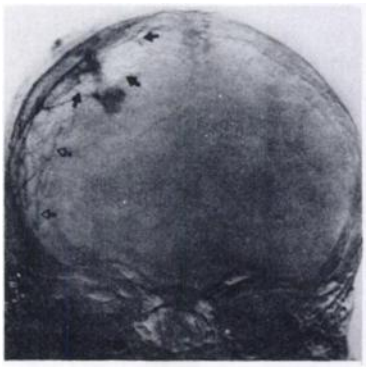

FIG. 5. Subtraction anteroposterior view clearly demonstrates several venous channels (arrows) draining diploic meningioma.

4 and 5). Surgery revealed a large, firm, encapsulated mass immediately beneath the skin that projected through the skull and eroded the outer table of the bone. The lesion was connected to and penetrated the dura. There was no evidence of an intracerebral mass. Pathologic examination of the mass showed a meningotheliomatous meningioma.

DISCUSSION

Fungus durae matris (perforating tumors of the skull) are uncommon lesions (*6*) and associated trauma is frequently present. Although the origin of penetrating tumors of the skull remains in dispute, in this case the tumor most likely originated from the dura.

Whereas x-ray films of the skull were suggestive of a vascular tumor, the typical sunburst or sun-ray effect was not evident. The location of the tumor, its high degree of vascularity, and the prominent pattern of venous drainage strongly indicated a meningioma. The initial discrepancy between the high vascular blush observed on the radionuclide angiogram and the blush observed on the contrast angiogram was disturbing, but two factors may be responsible for the somewhat contradictory appearance. First, in a radionuclide angiogram the vessels of superficial or diploic meningiomas are filled simultaneously through both the internal and external carotid feeders whereas only parts of the tumor are filled on selective contrast angiography. Second, the radionuclide angiogram may be more likely to demonstrate the extent of this type of meningioma, which has a large extracranial soft-tissue component. A similar case of a patient with a sphenoid wing meningioma has recently been observed.

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