Visceral Metastasis from a Meningioma: * Report of a Case

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MENINGIOMAS, though usually benign tumors in their morphology and behavior, occasionally show the histologic characteristics and the growth pattern of malignancy. Nevertheless, it is rare for meningiomas, like intracranial tumors in general, to metastasize outside the central nervous system.

The following case is presented as a histologically verified case of meningioma with visceral metastases.

Case Report

Clinical Summary: A 31-year-old woman was well until November 1957, when she developed a moderately severe fronto-occipital headache, accompanied by vomiting. The symptoms lasted one day, but recurred approximately monthly until April 1948, when the headache became constant. Occasional vomiting persisted. Two weeks later the patient noted recurrent transient episodes of blindness in the right eye. She was treated for sinusitis for a time, and was admitted to the Grace-New Haven Community Hospital on May 19, 1948, for diagnostic studies.

Examination revealed a questionable bruit in the right temporal region, not audible on the left. There was 3 to 4 diopter bilateral papilledema. Neurological examination revealed intact cranial nerve function, and there was no evidence of motor or sensory weakness or of asymmetry in the deep tendon reflexes. The remainder of the physical examination was within normal limits.

Skull films showed atrophy of the inner table of the calvarium, following the convolutional pattern. The dorsum sellae was also atrophic. There was notable thinning of the left sphenoid ridge (Fig. 1). A ventriculogram yielded evidence of a space occupying lesion in the left frontal region.

A craniotomy was performed. On elevation of the left frontal lobe an apparently encapsulated tumor was found, which was easily separated from the overlying brain. It was dissected free from its dense attachment to the dura and ablated, and apparently in its entirety. Hemostasis was a problem throughout the operation.

Postoperatively, the patient was given radiotherapy, totaling 4,326 r., tumor dose, by three portals. She was discharged from the hospital on April 19, 1948, with a residual complete motor aphasia and a right hemiparesis.

Her general health remained good, although the neurologic deficit remained, until June 1959, when she was 43. At that time she suffered the gradual onset of pain and tenderness over the left anterior chest, left subcapsular area, and epigastrium. The patient was readmitted to the hospital on June 22, 1959. Physical examination revealed tender soft tissue swelling over the left costochondral junctions. In addition, there was a huge, hard, smooth, rounded, nontender mass occupying the right upper quadrant of the abdomen, extending below the iliac crest and across the midline into the left upper quadrant.

Radiological examination, including upper and lower gastro-intestinal series, intravenous pyelography, and bone series for metastases, showed an upper abdominal mass that could not be separated from the liver, and that compressed the duodenum, displaced the right kidney laterally, and displaced the transverse colon inferiorly. There was no evidence of an intrinsic lesion of the gastro-intestinal or upper urinary tracts. The lungs and bones showed no changes.

On July 10, laparotomy was performed. Exploration revealed a large solitary tumor attached to the left lobe of the liver. In addition, many enlarged lymph nodes, measuring 2–3 cm. in

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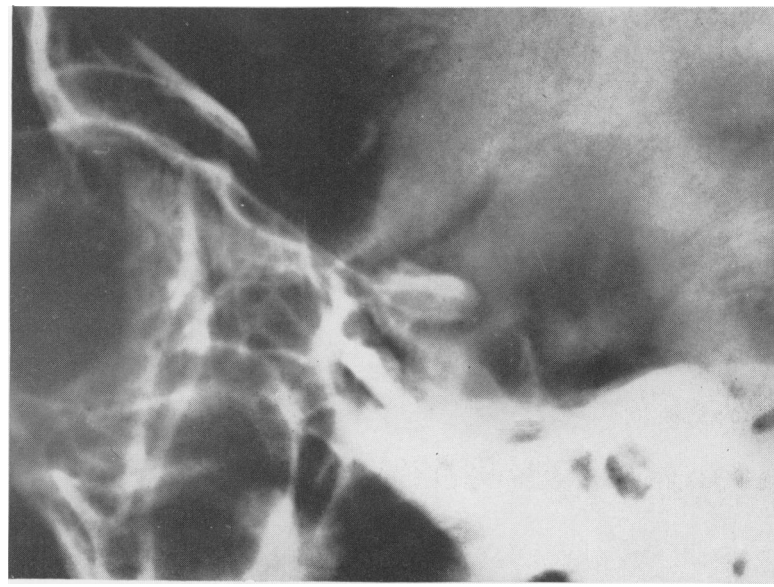

FIG. 1. Portion of lateral skull film, 1948, showing thinning of sphenoid ridge and atrophy of dorsum sellae.

diameter were found around the superior mesenteric vessels and in the gastrocolic ligament. The hepatic mass was resected and the patient discharged on July 21.

She made a good recovery from the operation, but in subsequent weeks developed anorexia, inability to swallow, and recurrent episodes of nausea and vomiting. There was recurrence of a right upper quadrant abdominal mass. There was progressive weight loss. She was treated symptomatically. The patient died at home on August 25, 1959. Permission for autopsy was not obtained.

Pathologic Findings: *Craniotomy Specimen.* May 24, 1948. The specimen was a globular mass weighing 97 Gm., and measuring 5 cm. in greatest diameter. The surface showed nodular projections, and there were many blood vessels coursing over it. The tissue was firm, and its cut surface was uniform and nearly white.

Microscopic sections showed a highly cellular tumor containing many thin-walled blood vessels (Fig. 2). The tumor cells were of medium size, fusiform to irregular in shape, and showed poorly-defined cytoplasmic borders. Nuclei were quite variable in size and shape, but predominantly

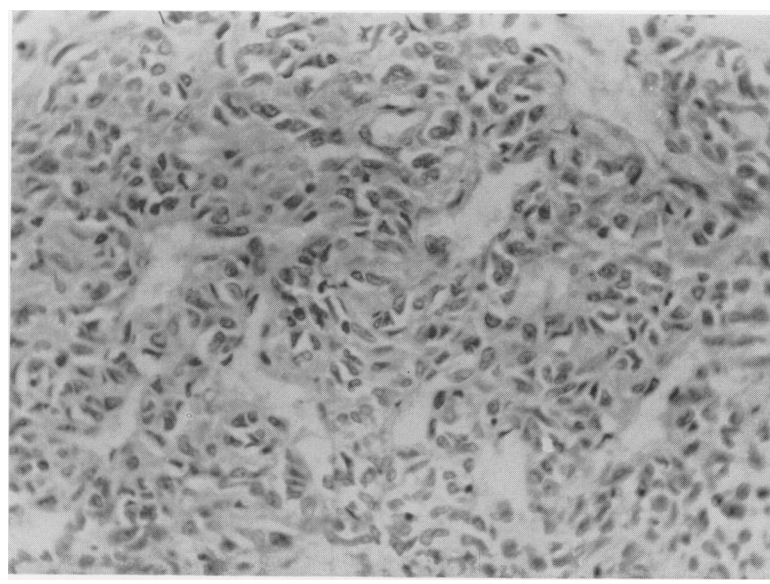

FIG. 2. The intracranial tumor, showing spindle cells forming neoplastic vessels (from H & E 180 ×).

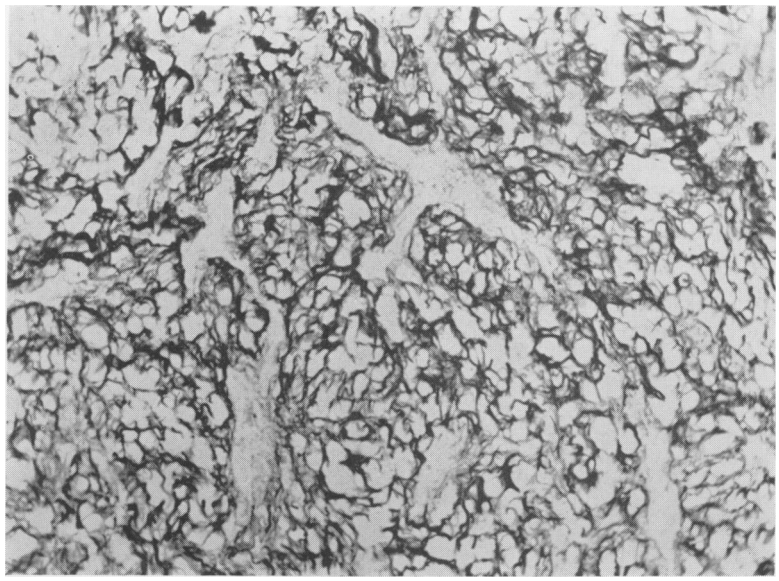

FIG. 3. The intracranial tumor, showing the reticulum network permeating among the cells. Laidlaw's connective tissue (from 180 ×).

oval. The larger nuclei contained conspicuous nucleoli. Mitotic figures were moderately numerous. The vessels, varying in number throughout the tumor, had the appearance of dilated, thin-walled capillaries, and were lined by flattened endothelial cells closely resembling the tumor cells not associated with the vessels. Sections stained by Laidlaw's method for reticulum fibers (Fig. 3) showed an abundant honeycomb of recticulum among all the cells, without any clear-cut pattern, but somewhat condensed about the vessels.

Laparotomy Specimen. July 10, 1959. The specimen was an ovoid mass of tissue weighing 1,540 Gm., and measuring 20 × 18 × 15 cm. (Fig. 4). On one surface, a small margin of liver tissue was seen. The surface was irregularly bosselated; the individual nodules measuring up to 1.5 cm. in diameter. On section the tumor was found to be firm and of somewhat nodular texture. Its color varied from pale gray to pink.

Microscopically the lesion was indistinguishable from the original meningeal tumor, and the vascular pattern was equally striking (Fig. 5, 6). The major portion of the tumor was composed of oval or spindle cells, which in some areas formed

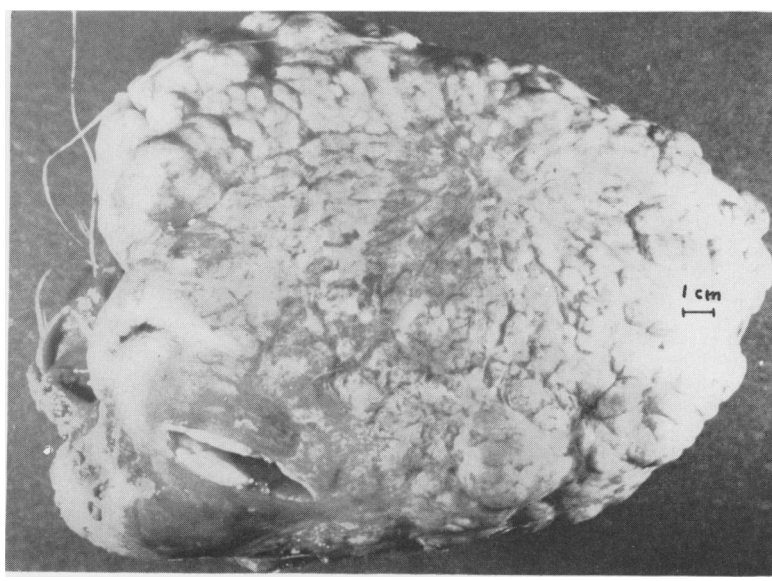

FIG. 4. The mass resected from the liver in 1959.

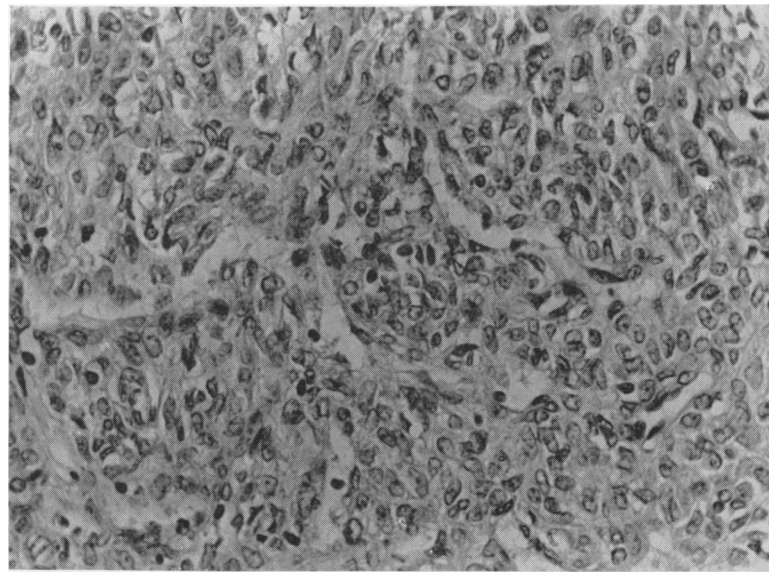

FIG. 5. The hepatic tumor. Note similarity to Figure 2. (from H & E 180 ×).

blood vessel like channels. Sections stained by Laidlaw's connective tissue method again showed the regular, all pervading network of reticulum. In general, however, there was a slightly greater number of mitotic figures, and perhaps slightly more pleomorphism of nuclei.

Discussion

Both the intracranial and the hepatic lesions described above show a strikingly similar and distinctive histologic pattern, leaving little doubt that one is a metastasis from the other. The tumor tissue, composed largely of spindle cells, shows a notable tendency to form angioid structures closely resembling normal blood vessels, suggesting that the tumor is a hemangioblastic neoplasm. The occurrence of meningeal tumors with this pattern is well established; [2, 3] these are designated angioblastic meningiomas by Cushing and Eisen-

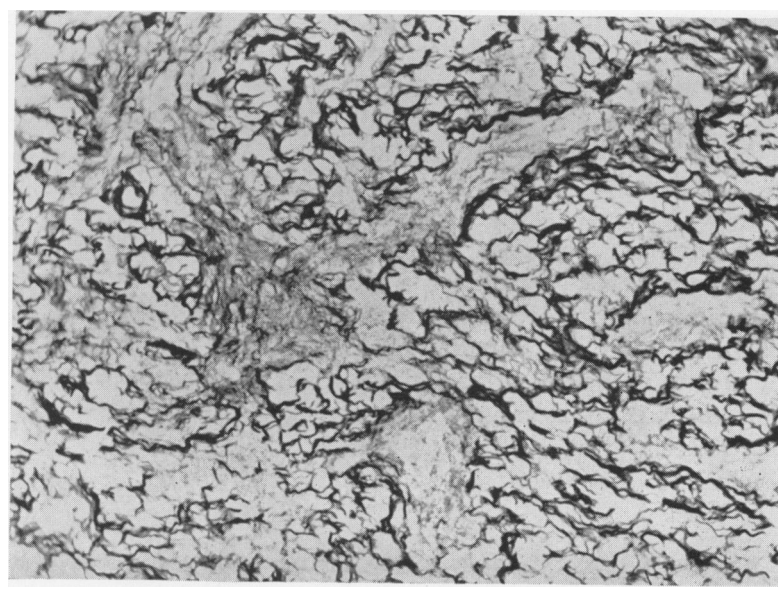

FIG. 6. The hepatic tumor, showing reticulum pattern similar to that of intracranial tumor. Laidlaw's connective tissue (from 180 ×).

hardt. The intracranial lesion from this case was examined by Dr. Eisenhart, and she classified it as such.[5] Angioblastic tumors may also arise primarily in the liver, but the liver tumor that most closely resembles the lesion in the present case, the infantile hemangioendothelioma, is apparently limited to childhood.[4] This observation combined with the 11-year interval between the appearance of the meningeal lesion and the discovery of the hepatic lesion suggest that the former is primary.

Many classifications of meningeal tumors have been proposed, and none has found universal acceptance. However, it would appear that today the scheme of Cushing and Eisenhart,[3] or a simplification of it, is in most general use. By their classification the present case would be designated Type IV, Variant 1: angioblastic meningioma, incompletely differentiated, with mitoses. Their work[3] lists six cases of this type. These tumors show a propensity for local recurrence, and, notably, none of the patients survived longer than five years.

Ringsted,[7] in 1958, collected 16 cases of metastasizing meningioma fulfilling his criteria of acceptability and added one of his own. Since then, at least two further cases have been reported,[6, 8] raising the total to 19. Judging from the illustrations in the original descriptions, at least three cases are of the angioblastic type.[1, 6, 9]

It is remarkable that two of these three cases survived 13 years after the original craniotomy, and succumbed with metastases, despite the usually rather rapid progress of this tumor. It is possible that tumors of this kind would produce distant metastases more often if the patients survived long enough, and that in most cases it is the critical location of the primary that leads to death before the tumor has reached the stage where it is capable of metastasis.

Summary

A 31-year-old woman had a resection of an intracranial meningioma of the angioblastic type. Twelve years later a histologically verified metastasis to the liver was resected, and the patient died a few months later. This is the twentieth case of metastasizing meningioma to be reported, and the fourth of the angioblastic type. Three of the four survived 11 years or more after craniotomy.

Acknowledgment

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