Dural liposarcoma associated with subdural hematoma

Case report

P. Kothandaram, M.S., F.R.C.S. (Edin.)
Department of Neurological Surgery, Royal Manchester Children's Hospital, Pendlebury, Manchester, England

This rare tumor of infancy, a primary liposarcoma of the dura, was first thought to be a subdural hematoma.

Case Report

On September 1, 1966, a 4-month-old baby girl was admitted to the hospital because of increasing head circumference and intermittent vomiting. No history of birth trauma or head injury could be obtained.

First Admission. Head circumference was 18 inches, the fontanel full, and the scalp veins prominent. Radiographs showed marked separation of the sutures. The hemoglobin was 85%. Fontanel aspiration yielded 40 cc of blood-stained fluid from the subdural cavity of each side, and thereafter 25 cc from each side on four successive days.

Operation. On September 5, bitemporal burr holes drained further amounts of subdural hematoma and revealed a thin subdural membrane on the right side; there was no membrane on the left side. A 4F rubber tube placed in the right subdural cavity was removed the following day. The fontanel remained concave until the 10th postoperative day when it became tense; subdural tap released 30 cc of blood-stained fluid from the right side and 5 to 10 cc from the left side. Eleven days after the burr hole operation, unhealthy-looking skin over the right temporal burr hole was excised, and an additional burr hole was made more posteriorly on the right side, through which further subdural hematoma escaped. The right subdural space was drained with a 4F rubber catheter for 3 days.

When the baby went home on September 23, 1966, the head circumference was 17.5 inches and the fontanel concave.

Second Admission. On December 31, 1968, the child now 2 years 7 months was readmitted to the hospital because of headaches, vomiting, and increasing drowsiness of 4 weeks' duration. She was thin and pale, with slight neck rigidity. There was bilateral papilledema with retinal hemorrhages. The temperature was 36.2°C, the head circumference 20 inches, and the fontanel fused. The right posterior burr hole was bulging but not tense. Power in the limbs was normal, reflexes uniformly brisk, and plantar responses both extensor. The hemoglobin was 79%, white blood cell count 84,000 cu mm with predominant polymorphs, and the sedimentation rate 50 mm in the first hour. X-ray films of the skull showed marked separation of sutures. The serum electrolytes were normal and the blood urea 37 mg%. Bilateral carotid angiograms showed a lens-shaped filling defect on the right anteroposterior venogram, and the left lateral venogram showed a filling defect in the posterior parietal region.

Operation. On January 1, 1969, a burr hole placed just above and behind the left
ear revealed clear cerebrospinal fluid and normal cerebral cortex without evidence of any overlying subdural membrane. However, when the original right posterior parietal burr hole was reopened, the dura was very much thickened (0.5 cm) with an adherent layer of vascular membrane, from beneath which a collection of brown sauce-like material was sucked out. This procedure revealed a nodular layer of thick white material in the floor of the subdural cavity. The bone opening was enlarged, and the white material scraped away without much bleeding. As the brain did not expand, a 4 mm bore drainage tube was used to drain the subdural cavity for 4 days until the discharge of thick mucoid material had ceased. No organisms were grown from the mucoid discharge. Tumor cells were not present. The blood white cell count remained high, varying from 73,000/cm³ to 81,000/cm³ with 93% polymorphs. The bone marrow was highly cellular with evidence of myeloid activity.

The white nodular material taken from the right subdural cavity was examined by Dr. H. B. Marsden who reported foci of polymorphs with fibrous reaction, numerous vacuolated macrophages, and densely cellular areas with pleomorphic cells showing mitoses and inclusions.

**Postoperative Course.** The child continued to vomit. The right parietal decompression filled up rapidly with soft necrotic material. Her condition deteriorated and she died on January 26, 1969.

**Postmortem Examination.** (Dr. H. B. Marsden). The abnormal findings were confined to the head. Scalp reflection revealed white fleshy tumor eroding the skull in both parietal regions. The tumor had extended through the right craniectomy wound into the subaponeurotic space. When the calvaria had been removed it was evident that the tumor had fungated through the parietal dura. Both cerebral hemispheres were covered by tumor, with a maximum thickness of 4 cm (Fig. 1). The brain itself was not invaded but several areas of the cortical surface were depressed. The growth had spread upward toward the superior sagittal sinus and had occluded but not invaded the sinus.

Histology of the subdural tumor showed pleomorphic cells with diameters varying from 20 to 100 μ. The larger cells had irregular nuclei, and were often lobulated with prominent nucleoli. Some cells were multinucleated. Mitotic figures were moderate in number and were sometimes atypical. The larger cells also showed abundant eosinophilic cytoplasm with vacuolation, due to the presence of large amounts of fat (Fig. 2). They were regarded as lipoblasts. Fat stains (Sudan preparation) demonstrated that a few of the tumor cells had a more elongated appearance, with irregular spindle formation. Some cells contained P.A.S.-positive glycogen granules. The presence of reticulin fibers was confined to vessels and major septa, and there was no extension between small groups or individual cells. Necrosis, hemorrhage, and hemosiderin were prominent. Large vascular channels were noted, some showing thrombosis.

**Discussion**

Primary intracranial sarcomas occur mostly in infants and children, but are rare. Two types of dural sarcoma are described. The first is a meningoïd turning malignant, a meningosarcoma, and is not the same as primary sarcoma of the dura as described by Russell and Rubenstein. Zulch points out that meningosarcoma, although rapidly growing, does not invade the subdural space whereas primary dural sarcoma spreads freely in the subdural space.

Bailey and Ingraham distinguish primary sarcomas of the dura from those arising from

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**Fig. 1.** Posteroanterior view of the brain showing subdural tumor. The posterior aspect of the tumor has been removed to show the thickness of the mass and the indentation of the cerebral cortex.