Intracranial Osteochondroma: MR and CT Appearance

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Osteochondromas are rare intracranial lesions that have been reported to arise from the skull base and dura. We report a case of a midline osteochondroma arising from the inferior portion of the falx and replacing the midportion of the corpus callosum, and we describe the MR and CT appearances.

Case Report

A 48-year-old right-handed man presented to the University of Iowa for evaluation of unsteadiness of gait over the previous 6 months. He also reported a 1-year history of bifrontal headaches that were worse in the morning and improved during the day. He had experienced good health all his life, and his past history was unre-

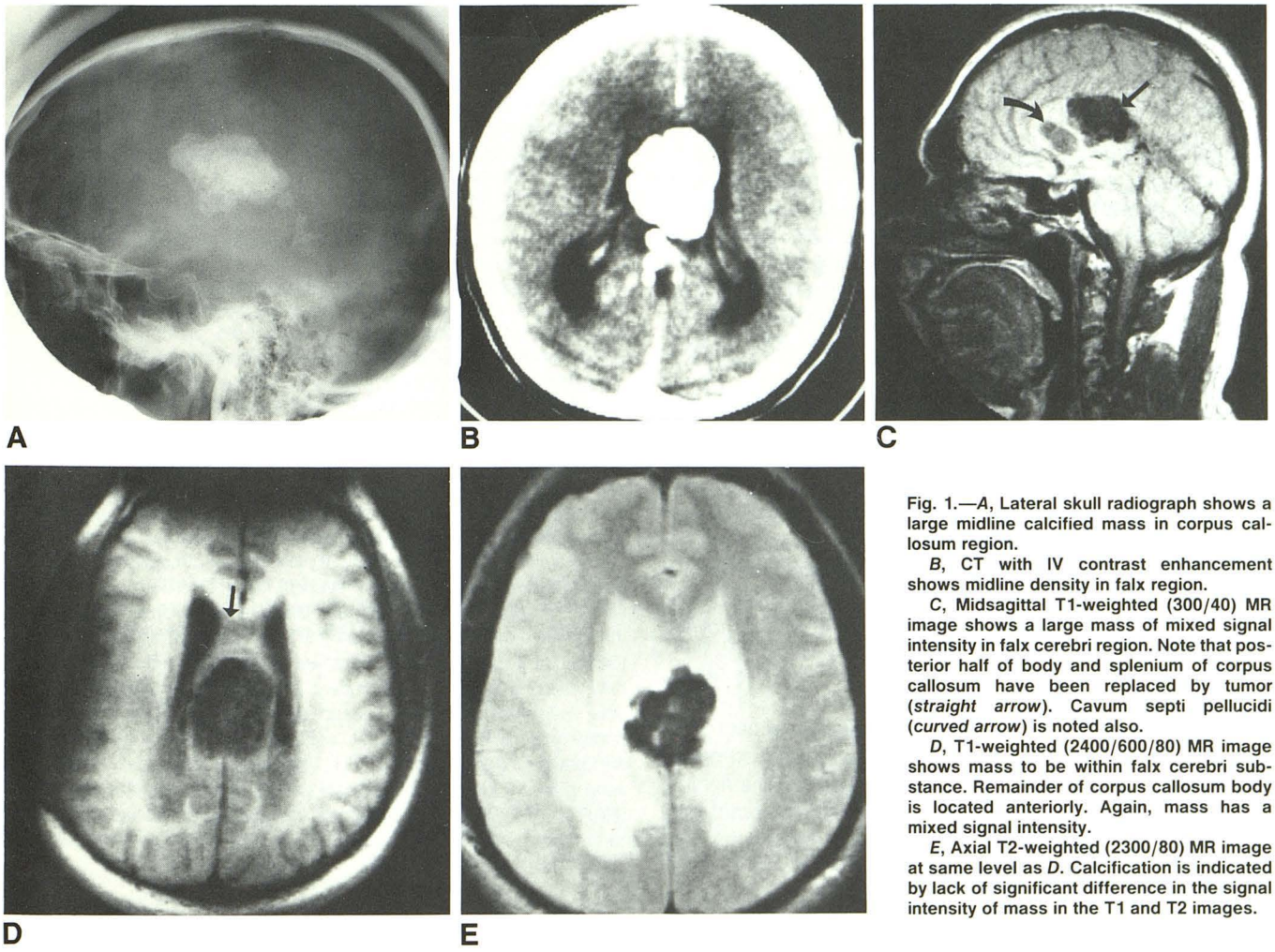

Fig. 1.—*A*, Lateral skull radiograph shows a large midline calcified mass in corpus callosum region.

***B*, CT with IV contrast enhancement shows midline density in falx region.**

***C*, Midsagittal T1-weighted (300/40) MR image shows a large mass of mixed signal intensity in falx cerebri region. Note that posterior half of body and splenium of corpus callosum have been replaced by tumor (*straight arrow*). Cavum septi pellucidi (*curved arrow*) is noted also.**

***D*, T1-weighted (2400/600/80) MR image shows mass to be within falx cerebri substance. Remainder of corpus callosum body is located anteriorly. Again, mass has a mixed signal intensity.**

***E*, Axial T2-weighted (2300/80) MR image at same level as *D*. Calcification is indicated by lack of significant difference in the signal intensity of mass in the T1 and T2 images.**

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markable. His general physical examination was normal. His neurologic examination revealed a wide-based, unsteady gait. He had no other neurologic findings. Neuropsychological testing revealed left-hand tactile anomia and a mild alexia and agraphia. In addition, he had a mild left ear extinction on dichotic listening.

Skull radiographs revealed a large calcified mass in the region of the corpus callosum (Fig. 1A). On CT, the mass did not enhance with contrast infusion. The mass was somewhat asymmetric with a larger portion of the tumor on the left side (Fig. 1B). MR imaging localized the mass to the region of the distal body and splenium of the corpus callosum (Fig. 1C). The MR appearance did not change between T1 and T2 images, consistent with the calcification within the tumor (Figs. 1D and 1E).

The patient underwent a left frontoparietal craniotomy with total excision of the tumor via an interhemispheric approach. At surgery, the mass was very hard and required a CO_2 laser for excision. The tumor appeared to rise from the inferior portion of the falx. No corpus callosum was seen in the area of tumor, and it appeared that the mass had completely replaced the posterior body of the corpus callosum. After surgery, the patient had a mild weakness in his right foot, which improved to normal over the next 6 weeks. His neuropsychologic testing 3 months after surgery revealed improvement of his left hand anomia. He had a mildly impaired left-handed agraphia, but this also was improved from preoperative testing. His gait at 3 months was normal.

Discussion

Osteochondroma is the most common benign bone tumor, accounting for 40% of the benign lesions in the Mayo Clinic series [1]. Intracranial osteochondromas are rare. In Cushing's series of 2023 intracranial tumors, only three were osteochondromas [2]. Most of these tumors arise from bones that are embryologically derived from cartilage [3, 4], which accounts for their predilection for the base of the skull [5, 6]. Only some 15% of intracranial cartilaginous tumors have a parafalcial dural attachment as seen in this case.

The radiologic appearance of this tumor is fairly typical but not diagnostic. Skull radiographs show evidence of bony changes caused by local tumor growth, increased intracranial pressure, and areas of tumor calcification [5, 7]. The skull radiographs in this case showed the midline location of the tumor well. The CT appearance of these tumors is variable. Matz et al. [8] reported a large frontoparietal osteochondroma demonstrating a high-density mass with foci of lower densities, producing a honeycomb appearance. The lesion showed a modest degree of enhancement after contrast infusion. Ikeda [9] reported a middle fossa osteochondroma that demonstrated a high-density, irregularly shaped mass on CT. These findings are similar to those of the present case, in which the mass did not enhance after contrast infusion. The MR appearance of an intracranial osteochondroma has not been reported previously. The appearance of extracranial osteochondromas consists of a mixed signal intensity on both T1- and T2-weighted images [10], which is similar to the MR appearance in this case. The honeycomb appearance on MR conformed well to the findings at surgery of a mixture of soft tumor alternating with prominent areas of calcification. MR was clearly superior to CT in this case in respect to delineation of the local anatomy; this shows the importance of MR in preoperative surgical planning.

Surgical resection is the treatment of choice for cartilaginous falcial tumors [11, 12], and long-term survival is expected [11, 13].

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