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-

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markable. His general physical examination was normal. His neuro-
logic 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 CO2 laser for excision. The
tumor appeared to rise from the inferior portion of the corpus
callosum, which improved to normal over the next 6 weeks. His neuropsy-
cologic 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
parafacial 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 densi-
ties, producing a honeycomb appearance. The lesion showed

a modest degree of enhancement after contrast infusion.
Ikeda [9] reported a middle fossa osteochondroma that dem-

onstrated 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 cartilagi-
nous falcial tumors [11, 12], and long-term survival is ex-
pected [11, 13].

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