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Occipital intraosseous dermoid cyst with restricted diffusion on magnetic resonance imaging in a child

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ABSTRACT

A 4-year-old girl presented repeatedly with a complicated occipital mass, which was erroneously treated as a pyogenic granuloma. Imaging performed before a planned surgical resection detected an underlying intraoccipital dermoid with a sinus tract to the skin surface and extension into the posterior fossa. This case highlights the value of high-resolution computed tomography imaging for depiction of anatomic details and the value of magnetic resonance imaging for differential diagnosis and surgical management. A comprehensive literature review of intraosseous dermoid cyst and detailed discussion of the differential diagnoses are provided.

Case report

A 4-year-old girl presented repeatedly to a dermatology clinic with a 4-cm indurated plaque on her posterior scalp. This was initially thought to be a pyogenic granuloma and was treated with multiple extended courses of antibiotics and underwent incision and drainage twice without resolution of symptoms. The patient was then referred to a general surgery clinic for excision of the presumed subcutaneous soft tissue lesion. Intraoperatively, the lesion was found to have a sinus track extending down to the galea of the occipital bone. The scalp lesion was removed and a cuff of pericranium was incised around the sinus track, revealing extension of the lesion into the occipital bone. An intraoperative neurosurgical consultant recommended brain magnetic resonance imaging (MRI) to better assess the full extent of the lesion. The surgery was aborted and the lesion was not excised pending neuroimaging.

The MRI of the brain with intravenous contrast showed a $2.5 \times 1.6 \times 1.7$-cm round, well-marginated lesion centered within the midline occipital bone. The lesion demonstrated hyperintense signal on T2WI, low signal on T1WI with a thick peripheral rim of low signal on T2WI, and mild peripheral enhancement (Fig. 1). The lesion showed restricted diffusion, which can be

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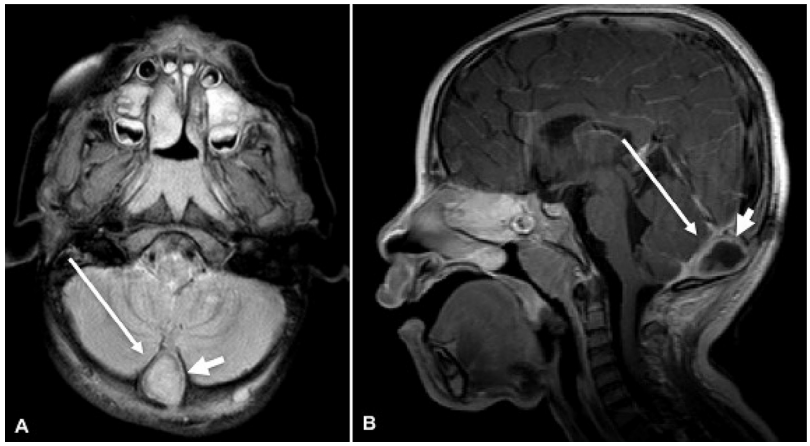

Fig. 1 – A 4-year-old girl with intraoccipital dermoid with associated dermal sinus tract. Preoperative MRI. Findings: The calvarial lesion demonstrates content that is of high T2 and low T1 signal (A and B, long arrows), and the lesion has a thick low T2 signal enhancing rim (A and B, short arrows). These imaging findings can be seen in abscess and dermoid cysts. Technique: (A) MRI, 1.5 T, T2, axial plane, TR 2500, TE 85, slice thickness 3 mm. (B) MRI, 1.5 T, T1 + contrast, sagittal plane, TR 615, TE 12, slice thickness 4.5 mm. Contrast: 5 mL MultiHance (Bracco Diagnostics Inc., Cranbury, NJ, U.S.). MRI, magnetic resonance imaging; TE, echo time; TR, repetition time.

seen with abscess or dermoid or epidermoid cyst (Fig. 2). The MRI located the lesion within the diploic space of the occipital bone, an extension into the epidural space of the posterior fossa, and a sinus track extending to the overlying scalp (Fig. 3). On the bone windows of the computed tomography (CT) angiogram, the lesion remained posterior to the torcular and the sinus tract was identified as a calvarial lucency with sclerotic borders (Fig. 4).

Following MRI and CT angiogram, the patient underwent neurosurgical resection of the lesion via a transoccipital approach. Gross examination of the specimen at the time of surgical resection demonstrated fat and hair follicles within a cystic lesion consistent with an occipital intraosseous dermoid cyst.

For several days following the procedure, the patient was noted to have slurred speech and ataxia. Postoperative MRI of the brain demonstrated T2/fluid-attenuated inversion recovery hyperintense, ring-enhancing lesions with restricted diffusion consistent with right cerebellar abscesses (Figs. 5). These were surgically drained and treated medically with antibiotics. The patient's symptoms gradually improved, and she was eventually discharged without any neurologic sequelae.

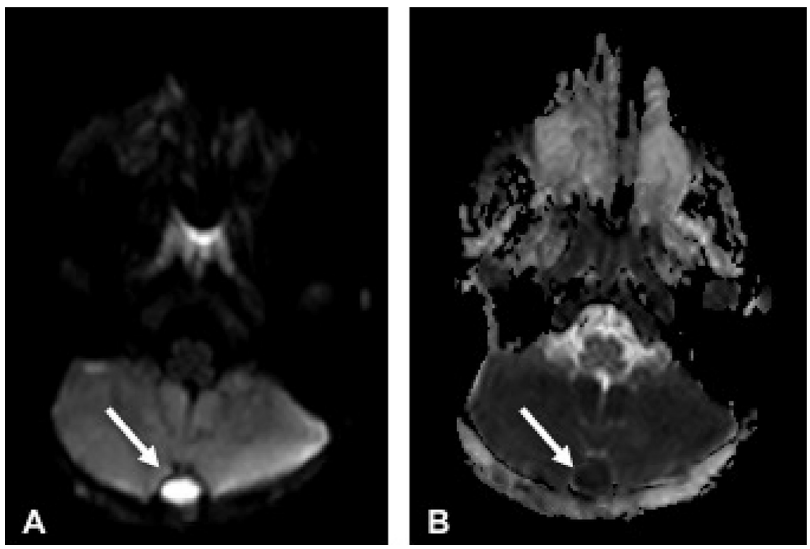

Fig. 2 – A 4-year-old girl with intraoccipital dermoid with associated dermal sinus tract. Preoperative MRI. Findings: The calvarial lesion demonstrates restricted diffusion with high signal on DWI (A) and low signal on ADC map (B). This finding can be seen both in an abscess and a dermoid cyst. Technique: (A) MRI, 1.5 T, DWI, axial plane, eB1000, TR 6011, TE 82, slice thickness 4 mm. (B) MRI, 1.5 T, DWI, ADC map, axial plane, TR 6011, TE 82, slice thickness 4 mm. ADC, apparent diffusion coefficient; DWI, diffusion weighted imaging; MRI, magnetic resonance imaging; TE, echo time; TR, repetition time.