K.C. Bailey\textsuperscript{a}  
M.R. Sochor\textsuperscript{b}  
M. Wintermark\textsuperscript{a,∗}  
J.S. Huff\textsuperscript{c}  

\textsuperscript{a}University of Virginia, Department of Radiology, Neuroradiology Division, Charlottesville VA, United States  
\textsuperscript{b}University of Virginia, Department of Emergency Medicine, Charlottesville VA, United States  
\textsuperscript{c}University of Virginia, Department of Emergency Medicine and Neurology, Charlottesville VA, United States  

\textsuperscript{∗}Corresponding author. Division Head Department of Neuroradiology University of Virginia PO Box 800170 Charlottesville, VA 22908, United States.  
E-mail address: Max.Wintermark@virginia.edu (M. Wintermark)  

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Posterior fossa dermoid cyst with a sinus tract and restricted diffusion on MR imaging: Value of structural imaging findings and signal characteristics

\textit{Kyste dermoïde de la fosse postérieure avec sinus dermique et diffusion restreinte en IRM: apport de l'imagerie morphologique et caractéristiques du signal}

We present the case of a six-year-old boy with a subcutaneous palpable mass in the midline occipital region persisting since birth. The patient was referred for pediatric brain MR with contrast for further evaluation. Sagittal T1-weighted images showed a moderate sized midline intracranial posterior fossa cyst. Apparent communication with a small subcutaneous cyst was noted via a sinus tract coursing through an occipital bone defect in the midline (Fig. 1A). The cysts followed CSF signal in all pulse sequences without increased T1 or T2 signal within the cyst to suggest the presence of either fat or calcification. The cysts displayed restricted diffusion both in the intracranial and extracranial components (Fig. 1B,C). The posterior fossa was normal in size and the cerebellum, vermis andpons displayed normal shape and signal. Supratentorial brain was normal. There was no abnormal contrast enhancement of the cysts nor the brain parenchyma or meninges. The patient had surgery on the day following MR imaging.

Intracranial dermoid and epidermoid cysts are congenital ectodermal inclusion cysts. Dermoid and epidermoid cysts are very rare, accounting for 0.1%–0.7% and 0.2%–1.8% of all intracranial tumors, respectively [1–4]. Though both rare, epidermoid cysts are reported to be four to nine times more common than dermoids in adults [2–4]; however, dermoids are reported to be more common in the pediatric population [4]. Posterior fossa dermoids are frequently associated with congenital dermal sinus tracts, which can predispose to recurrent meningitis and other infections, possibly explaining why they are detected earlier during childhood [1,5]. Dermoids most commonly occur in the midline of the anterior fontanelle or occipital region of children. The midline location is likely due to formation of the falx and tentorium by invaginating folds of dura, which can inadvertently draw in ectoderm [1–3,5]. Contrarily, epidermoid cysts are most often found in lateral locations, such as the cerebellopontine angle or parasellar cisterns, due to lateral displacement by developing optic and otic vesicles [3–5]. Dermoids and epidermoids are frequently differentiated on the basis of MR findings; however, as in our case, overlapping features can be observed. Typically, epidermoids are hyperintense to CSF on T1 and T2 weighted images; they do not display contrast enhancement [3,4]. Epidermoids can often be differentiated from other cystic lesions by restricted diffusion on MR imaging. Dermoids tend to show more variability in signal intensity due to variable cholesterol and fatty content, which often results in hyperintensity on T1-weighted images [3,4]. In fact, nearly all reported dermoid cysts show high T1 signal intensity [2,3]. In our case, upon surgical resection, the cyst was found to have the ‘‘nastiness’’ of dermoid cysts, containing hair and sebaceous glands, and the pres-

\begin{figure}[h]  
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\caption{Sagittal T1-weighted image demonstrates a midline extra-axial cyst in the posterior fossa communicating with a small occipital subcutaneous cyst via a bone defect and sinus tract (A). Diffusion weighted image reveals increased signal (B) that is confirmed to be restricted diffusion on the ADC map (C).}  
\end{figure}
ence of adnexal tissue led to the diagnosis of a dermoid. With this confirmation, the decreased T1 and increased T2 signal of the cyst with restricted diffusion could be explained by hydrated keratinaceous material. Imaging findings in our case suggests that the structural characteristics can override signal characteristics alone in the differential diagnosis of dermoid and epidermoid. A midline mass with a sinus tract, especially in the pediatric age group, should raise suspicion of a dermoid despite the presence of restricted diffusion and the absence of fat and calcification.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

References


M.K. Matths b, a
S.S. Long b
T.A.G.M. Huisman a
J. Pindrik c
A. Tekes a

a pediatric radiology, the russell h. morgan department of radiology and radiological sciences, 600 north wolfe street, nelson basement, b-172 baltimore, md, 21287-0842, united states, united states
b the russell h. morgan department of radiology and radiological sciences, johns hopkins hospital, baltimore, maryland, united states

c department of neurosurgery, johns hopkins hospital, baltimore, maryland, united states