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Case Report

Concurrent dermoid and epidermoid cysts in an adolescent patient: a case report

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Abstract

Dermoid and epidermoid cysts are benign lesions of ectodermal origin which are pathologically distinct entities, although often clinically indistinguishable. Cyst location, mobility, and appearance on MRI can help distinguish the two, however the distinction is mostly academic since both types have similar management. Co-occurrence of dermoid and epidermoid cysts together in the same patient has not been observed in the literature, however one case of an epidermoid cyst evolving into a dermoid cyst has been documented. In this case report, we identify a 16-year-old male with three separate cysts of the scalp and leg which, after histopathological analysis following surgical resection, were found to represent both dermoid and epidermoid cysts. We offer potential explanations for this rare occurrence in the absence of a genetic syndrome and highlight the importance of performing a thorough work-up of patients with multiple cysts.

INTRODUCTION

Dermoid and epidermoid cysts are benign cysts of ectodermal origin which present as subcutaneous nodules and are often clinically indistinguishable. While both cysts are lined by stratified squamous epithelium, only dermoid cysts contain other ectodermal elements such as hair, sebaceous glands, or sweat glands [1]. Presence or absence of these skin adnexa distinguishes these two entities pathologically; however, the distinction can often be made prior to histopathologic analysis based on location, mobility, and imaging characteristics [1–3]. Dermoid cysts are congenital malformations and consequently are most frequently identified during infancy or adolescence, whereas epidermoid cysts may be acquired and are most commonly seen in young males [2, 3]. Patients or caretakers typically present with concerns over a growing subcutaneous nodule, seeking either reassurance of a benign nature of the nodule, or removal for cosmetic purposes [4]. The benign nature of these lesions can warrant conservative management; however, surgical excision is often sought for a number of reasons. Most commonly, removal is sought due to unfavorable cosmetic appearance, although other cited reasons include mitigating risk of intracranial invasion with epidural extension and limiting risk of rupture leading to infection [4–6]. Dermoid and epidermoid cysts rarely occur together, perhaps due to their separate embryological pathogenesis [7]. In this report, we present a case of a 16-year-old male who underwent surgical resection for multiple dermoid and epidermoid cysts of the scalp and extremities.

CASE REPORT

A 16-year-old male with no significant past medical history initially presented as an outpatient with complaints of a small lump on the left lower extremity for one year and a similar lump on the back of the head present for nine years. Initial examination revealed an approximately 2.5 cm × 1.2 cm mobile, nontender mass over the left anterior shin and a similar appearing lesion over the midline occipital scalp. Remainder of the physical exam was unremarkable. After a referral to general surgery, the patient underwent ultrasound of both lesions which confirmed subcutaneous lesions of the left leg (2.7 cm × 2.1 cm × 1.0 cm) and occipital scalp (4.2 cm × 3.6 cm × 0.9 cm). An MRI of the brain with and without contrast was obtained to ensure that the lesion had not entered the skull, revealing a T1-hypointense (Fig. 1), T2-hyperintense (Fig. 2) non-enhancing lesion of the occipital scalp with multiple septations and size consistent with previous ultrasound examination. The lesion was adjacent to the outer table of the skull with no evidence of intracranial extension. Interestingly, the MRI obtained at that time revealed a previously unidentified cystic lesion situated behind the left ear. This lesion also demonstrated T1-hypointensity (Fig. 3) and T2-hyperintensity (Fig. 4), measuring 1.6 cm × 1.5 cm × 1.5 cm. Contrasted to the midline occipital mass, this second lesion was situated between the inner and outer table of the occipital bone. Although the lesion remained outside of the dural lining, it did extend intracranially and thus, neurosurgery was consulted. Approximately two months later, the patient

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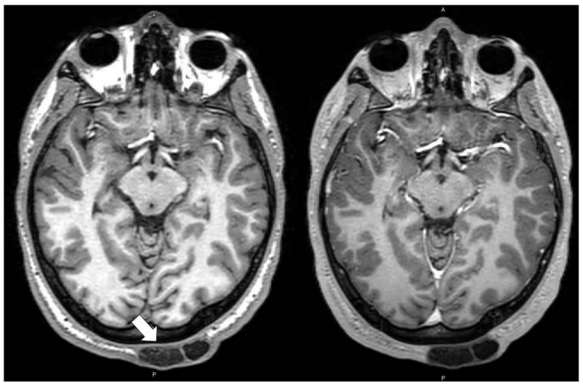

Figure 1. Axial T1 weighted MRI of midline occipital dermoid cyst before (left) and after (right) administration of gadolinium-based contrast. Note the lack of enhancement post-injection suggesting a benign nature of the lesion.

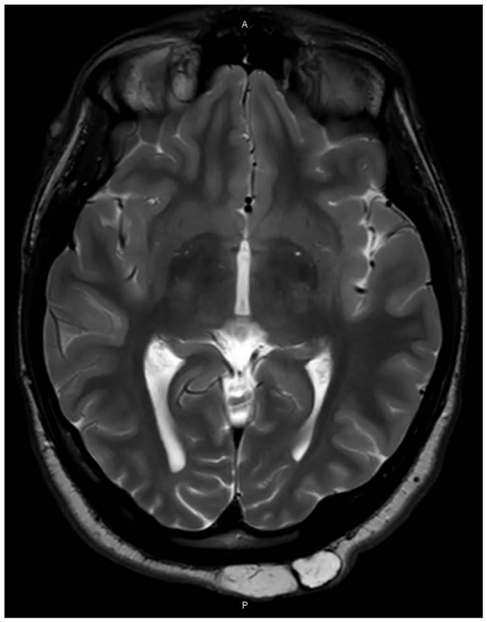

Figure 2. Axial T2 weighted MRI displaying midline occipital dermoid cyst. Note the increased signal intensity of the lesion due to high water content.

underwent surgical excision of his midline occipital and left retroauricular lesions, suspected to be dermoid cysts, followed by excision of his left lower extremity mass in the same operative setting. Procedures were performed by neurosurgery and general surgery, respectively. Stereotactic navigation was necessary for removal of the intraosseous cyst. Upon pathological evaluation, all removed specimens were identified to be cystic lesions lined by keratinized squamous epithelium. No skin adnexal structures were identified in either the left leg or left retroauricular mass, reflecting epidermoid cysts. The midline occipital mass, however, did contain rare skin adnexal structures within the cyst wall consistent with a dermoid cyst (Fig. 5). There were no complications post-operatively.

DISCUSSION

Although epidermoid cysts are the most common cutaneous cyst, and dermoid cysts are among the most common pediatric skull tumors, their occurrence together in the same patient has been

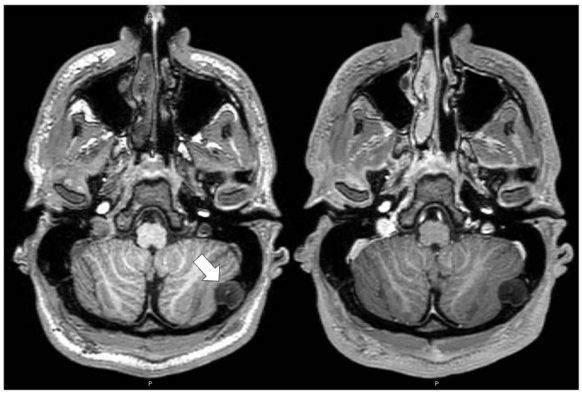

Figure 3. Axial T1 weighted MRI of retroauricular epidermoid cyst before (left) and after (right) administration of gadolinium-based contrast.

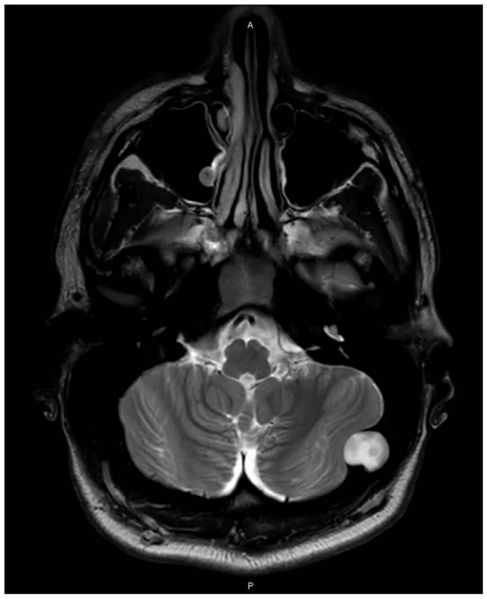

Figure 4. Axial T2 weighted MRI displaying left intraosseous retroauricular epidermoid cyst.

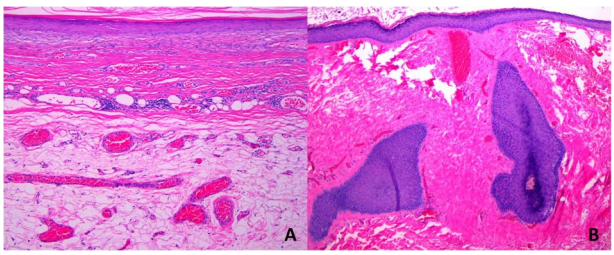

Figure 5. Histopathologic features of the epidermoid and dermoid cysts removed during surgery. The lesions from the left leg (**A**: H&E stain, original magnification 10×) and the midline occipital scalp (**B**: H&E stain, original magnification 4×) are both lined by keratinized squamous epithelium and filled with keratin material. Only the midline occipital lesion (B) has hair follicles in the cyst wall.

documented only once previously in the literature [4, 8, 9]. Perhaps one explanation for the paucity of documented co-occurrences is that the two cyst types are managed nearly identically with an often-indistinguishable clinical presentation; thus, differentiation is mostly academic. Although the two are histologically distinct entities, dermoid cyst is often used interchangeably to

denote either in clinical practice. Thus, it's possible that prior co-occurrences went unnoticed with an assumption that all cysts belonged to the same histological category. Interestingly, there is one prior case of an epidermoid cyst evolving into a dermoid cyst based on radiographic appearance [7]. If these radiographic changes accurately reflected a true evolution from epidermoid to dermoid cyst, then possibly a similar phenomenon occurred in the present case. This notion is partially supported by the intracranial invasion observed in the retroauricular epidermoid cyst, a feature more typical of dermoid cysts. However, the fact that the retroauricular cyst was off midline, along with pathological results excluding skin adnexal structures, we believe the two scalp masses to be truly distinct histological entities. The additional presence of the left leg cyst in this patient raises the potential for a genetic syndrome. Both Gardner and Lowe syndrome have previously been linked to multiple epidermoid cysts, however the patient presented in this case did not have any other clinical features consistent with either syndrome [2]. Ultimately, the most important consideration in this case is management. Initial physical examination revealed only two cysts, with the third discovered incidentally via brain MRI obtained for surgical planning. This third cyst had the most alarming features given its intracranial extension necessitating removal with stereotactic navigation. The presence of multiple dermoid and/or epidermoid cysts may serve as an indicator for even more cysts in an individual patient, even in the absence of a genetic syndrome. As in this case, identifying lesions early may be critical to mitigate risk of cyst growth and/or rupture leading to potentially devastating consequences. Additionally, both dermoid and epidermoid cysts have the rare potential for malignant transformation, further highlighting the importance of proper identification [3, 8]. Experiences from this case should urge healthcare providers who encounter a similar presentation to perform a thorough physical examination and consider neuroimaging to uncover any previously unidentified and potentially harmful cysts early in the clinical course.

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CONFLICT OF INTEREST STATEMENT

No conflicts of interest.

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ETHICAL APPROVAL

No ethical approval required.

CONSENT

Consent not obtained as patient has been sufficiently anonymized and cannot be traced.

GUARANTOR

Tamarah J. Westmoreland, MD, PhD.

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