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Case Report

Brain MRI Appearance of a Scalp Proliferating Trichilemmal Tumor: Case Report

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Abstract

Background: The proliferating trichilemmal tumor is a solid-cystic lesion in the hair follicle's isthmus. Most reported cases of proliferating trichilemmal tumors (PTT) exhibit a benign growth pattern; however, aggressive behavior can occasionally occur, characterized by invasion beyond the cyst wall that simulates squamous cell carcinoma. Additionally, local recurrence and distant metastasis have been observed. ***Case presentation***: A 57-year-old female with a histopathology-proven proliferating trichilemmal tumor presented with a recurrent scalp mass. It was a sizable occipital scalp mass that was ruptured to the skin with purulent discharge and surrounded by cellulitis. A brain MRI was performed, which showed a large mass on the right side of the occipital scalp. The mass was mostly solid and showed an isointense signal on the pre-contrast T1, T2, and FLAIR sequences, with some low-T1 and high-T2 signal intensity cystic areas. Homogenous enhancement of the solid part on post-contrast T1WI was evident, and no diffusion restriction was noted. The calvarium and intracranial extension did not show any gross invasion. In conclusion, imaging findings of proliferating trichilemmal tumors may help differentiate between closely similar lesions. It is also beneficial to evaluate surrounding soft tissue and intracranial extension denoting a malignant transformation.

Keywords: Brain MRI, Proliferating trichilemmal tumor, Trichilemmal cyst.

صورة رنين مغناطيسي للدماغ لورم جذر الشعرة المتكاثر في فروة الرأس: تقرير حالة

الخلاصة

الخلفية: ورم جذر الشعرة المتكاثر هو آفة كيسية صلبة في برزخ بصيلات الشعر. أظهرت معظم الحالات المُبلغ عنها نمطًا حميدًا لنمو PTT ، ولكن نادرًا ما يحدث سلوك عدواني على شكل غزو يتجاوز جدار الكيس، مُحاكيًا سرطان الخلايا الحرشفية، كما لوحظ تكرار موضعي ونقائل بعيدة. **عرض الحالة**: امرأة تبلغ من العمر 57 عامًا، مصابة بورم جذر الشعرة المتكاثر مثبت بالفحص النسيجي، حضرت مع كتلة متكررة في فروة الرأس. كانت كتلة كبيرة في فروة الرأس القذالية، ممزقة إلى الجلد مع إفرازات قيحية ومحاطة بالتهاب النسيج الخلوي. أجري تصوير بالرنين المغناطيسي للدماغ، وكشف عن وجود كتلة كبيرة في فروة الرأس القذالية اليمنى، وكتلة صلبة سائدة مسبقًا لإشارة رمادية على تسلسلات T1و T2و FLAIRقبل الصبغة، مع مناطق كيسية متعددة ذات شدة إشارة منخفضة و T2عالية. كان هناك ازدياد متجانس في اشارة الجزء الصلب على T1WI بعد الصبغة، ولم يُلاحظ أي تقييد للانتشار. لم يُلاحظ أي غزو واضح للجمجمة أو امتداد داخل الجمجمة. قد تُساعد نتائج التصوير بالرنين المغناطيسي لأورام جذر الشعرة المتكاثر في التمييز بين الآفات المتشابهة. كما يُفيد تقييم الأنسجة الرخوة المحيطة والامتداد داخل الجمجمة، مما يُشير إلى تحول خبيث.

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INTRODUCTION

The proliferating trichilemmal tumor (PTT) is a solid cystic growth in the isthmus of the hair follicle that looks like trichilemmal differentiation and has no clear cause. The human papillomavirus is occasionally implicated [1]. It develops either de novo or from a pre-existing trichilemmal cyst. It usually appears as a single, exophytic lesion, and the size varies from a few millimeters to several centimeters. It usually grows slowly; however, a rapid growth of the PTT may sometimes occur [2,3]. Microscopically, it is characterized by a partly cystic and solid lesion featuring enlarged keratinocytes, sudden keratinization, a lack of a granular layer, and varying degrees of cytologic atypia [4]. PTTs have a female predominance, and the World Health Organization (WHO) classification of skin tumors in 2018 has classified PTT into benign, locally aggressive, and malignant types [2,5]. Most reported cases showed a benign pattern of growth of PTT, but rarely aggressive behavior may occur in the form of invasion beyond the cyst wall simulating squamous cell carcinoma; local recurrence as well as distant metastasis is also encountered [2,6]. Imaging appearance of PTT in CT scan showing multiple complex solid-cystic scalp masses with variable tissue attenuation, including fluid, proteinaceous material, soft tissue, and calcification [7,8]. While the MRI appearance of PTT is a heterogenous intermediate to low signal in T1WI and either hypo- or hyperintense in T2WI with a hypointense rim as described in Figure 1 [7].

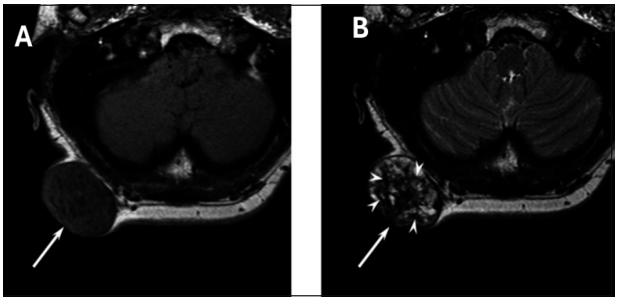

Figure 1: 57-Year-old woman with proliferating trichilemmal tumor on the scalp. **A**) T1-weight image shows a well-defined, oval, subcutaneous lesion (arrow), which is hypointense to gray matter. **B**) T2-weighted image shows a heterogeneous subcutaneous lesion (arrow) with linear or reticular hypointensity (arrowheads) [7].

Case Presentation

A 57-year-old female with histopathology-proven benign PTT presented with a recurrent scalp mass; on examination, it was a sizable occipital scalp mass that was ruptured to the skin with purulent discharge and surrounded by cellulitis. Broad spectrum antimicrobial therapy was initiated according to the results based on the culture and sensitivity from the purulent discharge, and definitive surgical excision of the tumor was decided following complete resolution of the infection. A preoperative brain MRI Siemens 1.5T was done, which reveals a right-sided occipital scalp mass measuring about 8.7 x 3.6 cm in size, a predominantly solid mass of isointense signal on precontrast T1, T2 & FLAIR sequences with multiple low T1 and high T2 signal intensity cystic areas. Homogenous enhancement of the solid part on post-contrast T1WI was evident, and no diffusion restriction was noted. No gross invasion to the calvarium or intracranial extension as demonstrated in Figure 2.

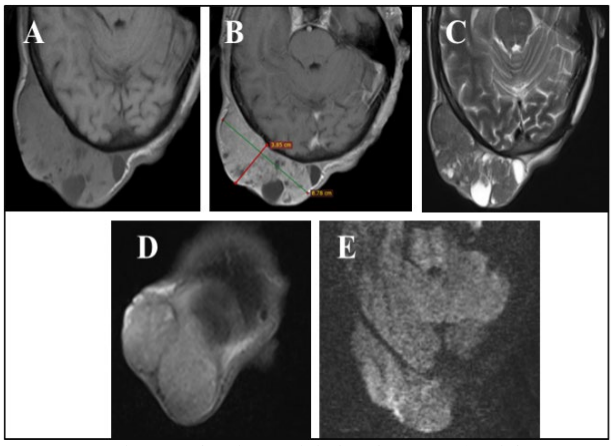

Figure 2: Brain MRI showing occipital scalp mass, **A**) axial T1WI pre contrast, **B**) axial T1 WI post IV gadolinium, **C**) axial T2WI , **D**) coronal FLAIR, and **E**) axial DWI.

DISCUSSION

PPT is an uncommon skin tumor that develops from the hair follicles' outer root sheath [9]. PTT typically manifests as a persistent, subcutaneous, cystic nodule that develops gradually and frequently becomes a large nodular mass after a history of trauma or inflammation. PTT manifests macroscopically as a well-defined mass with a lobulated edge, and the skin that covers it may be atrophying or ulcerated. The sliced surface typically resembles a honeycomb, with tiny cysts and cavities filled with keratinous material [10]. The patient in the current case was a 57-year-old female complaining of recurrent scalp histopathologically proven PTT, and this is matching with other studies, which showed that most patients are women and it usually occurs in the sixth and seventh decades of life, in which 90% of PTTs occur on the scalp [11,12]. The appearance of PTT on imaging studies is either a cystic or solid mass, as shown in a study conducted by Hyung-Jin Kim *et al*., and the signal characteristics of the solid tumor on MRI are indiscriminate from other soft tissue tumors where there are areas of hypointensity on T1-weighted images, hyperintensity on T2-weighted images, and marked enhancement after contrast [13]. The MRI of the present case was a predominantly solid tumor of intermediate signal intensity in T1 and T2, with no restriction in DWI. It demonstrates a substantial enhancement after contrast administration in addition to multiple non-enhancing cystic spaces. In brain MRI, intratumoral T1 hyperintensity may favor the diagnosis of trichilemmal cyst over PTT, as in many previous studies that compare both types of lesions, it was found that T1 hyperintensity was identified in trichilemmal cysts but not in PTT, a point that may help to differentiate between these two conditions [14,7]. Another finding that needs to be noticed is the ADC value, as the tumor shows no diffusion restriction and a high ADC value (4.40 x10 ^{3} mm^{2} S^{1}) which is considered a good differentiating point from epidermoid cysts that demonstrate diffusion restriction with low ADC values [7]. Because PTTs are rare, there is no scientific evidence for standard surgical care for either PTTs or trichilemmal carcinomas. Simple excision is ideal for PTTs, while the malignant counterpart requires wider margins, about 1-2 centimeters [15].

Conclusion

Imaging findings of proliferating trichilemmal tumors may help to differentiate between closely similar lesions like trichilemmal cysts (containing T1 hyperintensity) and epidermoid cysts (low ADC values). It is also beneficial to evaluate surrounding soft tissue and intracranial extension denoting a malignant transformation.

Conflict of interests

The authors declared no conflict of interest.

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Data sharing statement

N/A.

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