Pilomatricoma: Sonographic features

E. Garioni*, G.M. Danesino, L. Madonia

Institute of Radiology, Fondazione IRCCS Policlinico San Matteo, University of Pavia, Pavia, Italy

KEYWORDS

Pilomatricoma;
Ultrasonography;
Color Doppler.

Abstract Pilomatricomas (also known as calcifying epitheliomas of Malherbe) are benign subcutaneous tumors that arise from the cutaneous adnexa and usually affect young subjects. They typically present as solitary asymptomatic nodules located in most cases on the face or neck. On ultrasonography, pilomatricomas appear as hypoechoic lesions with inhomogeneous echo structures, well-defined margins, and posterior shadowing. Color Doppler generally reveals a single artery that penetrates the lesion and gives rise to multiple intralesional branches. Diagnosis is based on clinical and histological findings. The authors present a typical case of pilomatricoma diagnosed on the basis of clinical and sonographic findings that were subsequently confirmed by histology.

Sommario Il pilomatricoma è un tumore benigno sottocutaneo di origine annessiale tipico dell'età giovanile. Appare come nodulo solitario, asintomatico localizzato più spesso al viso e al collo. Ecograficamente è ipoecogeno con ecostruttura disomogenea, margini definiti e cono d'ombra posteriore, all'esame color-Doppler presenta, generalmente, un unico vaso arterioso che dal parenchima penetra nella lesione con multiple diramazioni intralesionali, la diagnosi definitiva è istologica.

Viene presentato un caso di pilomatricoma tipico, la cui diagnosi basata sulla clinica e l'ecografia, è stata confermata istologicamente.

© 2008 Elsevier Masson Srl. All rights reserved.

Introduction

Pilomatricomas (also known as calcifying epitheliomas of Malherbe) are benign subcutaneous tumors that arise from the cutaneous adnexa. They typically present as solitary asymptomatic nodules located in most cases on the face or neck. Their size generally ranges from 0.5 to 3.0 cm although pilomatricomas over 10 cm in diameter have been reported in the literature. Occasionally, they are

associated with signs of inflammation. They generally arise in young subjects (first or second decade of life) and are more frequent among females. Multiple forms have also been described [1,2].

Histologically, the tumor appears as a well-defined dermal or subcutaneous lesion composed of epithelial cells surrounded by stromal cells. Basophilic cells are seen in the peripheral regions of the tumor whereas the central region contains mummified ghost (or shadow) cells, which have lost their nuclei and are filled with keratin and often calcium deposits as well. The transitional cells located between the basophilic and ghost-cell populations seem to be cells that have undergone apoptosis and are on their way to becoming ghost cells. The stroma is composed of collagen and contains blood vessels [3].

* Corresponding author. Fondazione IRCCS Policlinico San Matteo, Università degli Studi, Istituto di Radiologia, p.le Golgi 2, Pavia, Italia.

E-mail address: ele.garioni@libero.it (E. Garioni).

Fig. 1 Sonography reveals a solid, oval-shaped mass with well-demarcated borders and a diameter of approximately 2 cm (A: panoramic imaging). The lesion is hypoechoic with multiple small calcifications (B).

Pilomatricomas are not aggressive tumors, and they are generally treated with surgical excision with margins of at least 1–2 cm to prevent recurrence, which is frequent following cases of incomplete resection [4].

Fig. 2 Color Doppler reveals an artery that penetrates the parenchyma of the lesion and gives rise to multiple intralesional branches.

The diagnosis of pilomatricoma is histological, but ultrasonography can be an aid in the interpretation of clinical findings.

Case report

The patient was a 7-year-old girl who presented with a firm, nontender swelling on the outer aspect of the distal third of the right arm. Sonographic examination of the lesion revealed a solid, oval, hypoechoic mass approximately 2 cm in diameter containing multiple millimeter-sized calcifications (Fig. 1). The color Doppler examination revealed a single artery that penetrated the parenchyma of the mass and gave rise to multiple intralesional branches (Fig. 2). Based on clinical and sonographic findings, the mass was diagnosed as a pilomatricoma. The tumor was excised, and the preoperative diagnosis was confirmed by the histological examination.

Ethical approval for this study was granted by the Medical Research Ethics Committee of our Institute, and informed consent was obtained from the patient's relatives.

Conclusions

On ultrasonography, pilomatricomas appear as well-demarcated lesions, generally oval in shape, with inhomogeneous echo structures characterized by anechoic areas representing cystic degeneration and punctate hyperechoic images corresponding to calcification. They exhibit posterior shadowing and a hypoechoic border that represents the connective-tissue capsule [1–3].

The differential diagnosis includes the following: *epidermal cysts* (which appear as hypoechoic masses with no detectable vascularization on color Doppler); *hemangiomas*, softer, lobulated masses which may or may not contain calcifications; when present, the latter are usually roundish; *hyperplastic lymph nodes*, which generally exhibit hilar vascularization and are uniformly hyperechoic; *ossifying hematomas*, which are nonvascularized lesions that are markedly hyperechoic with posterior shadowing; and *dermatofibrosarcomas*, which do not usually contain calcifications [3–5].

Pilomatricoma is a relatively rare tumor that is diagnosed on the basis of clinical and histological findings. Ultrasonographic findings serve as a support for the clinical and histological diagnosis. The sonographic examination can also rule out other types of pathology with similar presentations and reveal the relations between the tumor and the anatomical structures surrounding it.

Conflict of interest statement

None declared.

References

- [1] Hughes J, Lam A, Rogers M. Use of ultrasonography in the diagnosis of childhood pilomatricomas. *Pediatr Dermatol* 1999; 16(5):341–4.

- [2] Sari A, Yavuzer R, Isik I, Latifoglu O, Ataoglu O. Atypical presentation of pilomatricoma: a case report. *Dermatol Surg* 2002;28: 603–5.
- [3] Lim HW, Im SA, Lim GY, et al. Pilomatricomas in children: imaging characteristics with pathologic correlation. *Pediatr Radiol* 2007;37(6):549–55.
- [4] Kovacic M, Rudic M, Nekić I, et al. Pilomatricoma (benign calcifying epithelioma of malherbe) of the neck and face. *Dermatol Surg* 2007;33:340–3.
- [5] Hwang JY, Lee SW, Lee SM. The common ultrasonographic features of pilomatricoma. *J Ultrasound Med* 2005 Oct;24(10): 1397–402.