Case report

Pilomatrixoma mimicking a breast neoplasm: imaging finding in an uncommon case report✩✩

Abdellatif Bensalaha,⁎, Hiba Oudrhiri Benaaddacha, Imane Gouzb, Meryem Halouaa, Nizar Elbouardia, Badreeddine Alamia, Youssef Alaoui Lamrani⁎, Mustapha Maaroufa, Hinde El fatemi⁎, Meryem Boubboua

aDepartment of Radiology, CHU Hassan II, FEZ, Sidi Mohammed Ben Abdellah University, Morocco
bDepartment of Anatomopathology, CHU Hassan II, FEZ, Sidi Mohammed Ben Abdellah University, Morocco

ARTICLE INFO

Article history:
Received 17 May 2021
Revised 1 June 2021
Accepted 3 June 2021

Keywords:
Neoplasms breast
Pilomatrixoma
Microcalcifications
Mammography

ABSTRACT

Pilomatrixoma is a rare benign skin tumor originating from piliferous follicles, corresponding to a firm subcutaneous nodule requiring histology for diagnosis. Breast localization is considered to be very rare. Only few breast pilomatrixomas have been reported, with imaging showing well defined nodules with microcalcifications, presenting as ACR BI-RADS 4 and 5, suspicious for a breast neoplasm. We report a case of pilomatrixoma of the left breast of a 33 year old woman, appearing as a firm, deep nodule in the lower outer quadrant. The lesion had mammographic and sonographic finding mimicking a breast cancer. Percutaneous biopsy was performed to confirm the histological diagnosis.

© 2021 The Authors. Published by Elsevier Inc. on behalf of University of Washington. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/)

Introduction

Pilomatrixoma is a rare subcutaneous tumor, arising from the hair matrix. Although the diagnosis can be sometimes clinical, it is primarily histological. To our knowledge, only 8 cases of breast localization have been reported in the literature [1]. We report a case of pilomatrixoma in female patient, presented to our radiology department with a firm, deep nodule of the left breast, requiring mammographic and sonographic investigations. The lesion was classified as BIRADS IV, simulating a breast neoplasm. Histological analysis on core-needle biopsy was considered necessary.

Case presentation

A 33-year old woman presented to our radiology department, following self-examination of a palpable and painless...
Fig. 1 – 33 year old female with a firm nodule in the lower outer quadrant of the left breast diagnosed as a breast pilomatrixoma after percutaneous biopsy.

**FINDINGS:** nodular opacity in the lower outer quadrant of the left breast of 33 x 26 mm, showing a cluster of pleomorphic irregular microcalcifications (ACR BI-RADS IV).

**TECHNIQUE:** Analogic mammography, cranio-caudal (A) and medio-lateral oblique projections (B) of the left breast.

---

Fig. 2 – Mammographic control after 6 months, showing stability in size of the lesion with multiples pleomorphic calcifications increased in number, compared to a previous mammogram (Fig. 1)

**TECHNIQUE:** Analogic mammography, cranio-caudal (A) and medio-lateral oblique projections (B) of the left breast.

---

A nodule located in the left breast, growing over 2 years. Physical examination revealed a firm and mobile nodule with well-defined limits and a regular surface, without inflammatory signs around the site. There was no nipple discharge and no lymph nodes were found on palpation of the lymph node areas. The right breast showed no abnormalities.

Imaging examination was performed by ultrasound and mammography showed a lesion suspicious of malignancy. Mammography showed a well-defined mass, with multiple pleomorphic calcifications increased in number (Fig. 2), compared to a previous mammogram (Fig. 1). The size of the mass was 33 x 26 mm. Ultrasonography showed a
3.5 cm large hypoechoic, subcutaneous and uncircumscribed mass with a strong posterior acoustic shadow, due to microcalcifications. No locoregional lymphadenopathy was found. (Fig. 3)

Considering the imaging features, the lesion was classified as ACR BI-RADS IV. A core-needle biopsy (CNB) was performed in our radiology department. Pilomatrixoma was the final diagnosis, after histopathological and immunohistochemical studies (Figs. 4 and 5).

Discussion

Pilomatrixoma is a benign epithelial tumor of the skin arising from piliferous follicles [2]. Originally called Malherbe’s calcified epithelioma. It was first described in 1880 by Dr. Cheneval and Malherbe who considered it as a calcified epithelioma of the sebaceous glands [2]. Pilomatrixomas commonly develop in the subcutaneous tissue from the cellular matrix of hair follicles [2]. This tumor most frequently affects young women, with a female predominance. These tumors usually develop in the head and neck and, with less frequency, in the upper extremities, trunk and lower extremities [3].

To our knowledge, only 8 cases of intramammary pilomatrixomas have been reported in the literature [1]. Clinically, they appear as a subcutaneous firm mass, mobile or adherent to the skin surface. The skin opposite is usually normal, rarely violaceous [1].

Radiologically, breast pilomatrixoma has been described as a well-defined nodular opacity, with multiples pleomorphic calcifications increased in number progressively. It may also present as a nodule of the same density as the breast parenchyma [4,5]. The sonographic appearance is that of a hypoechoic nodule more or less calcified with a posterior acoustic shadow [4,5]. In our case, the mammographic and ultrasonographic finding of the pilomatrixoma was that of a well-defined nodular opacity with pleomorphic microcalcifications, with an appearance similar to the breast pilomatrixomas previously described in the literature. In all previous reported cases, the lesion was classified as ACR BI-RADS 4 and 5, suspicious for breast neoplasm, and justifying an ultrasound-guided biopsy for histological confirmation [1].

The histological appearance of breast pilomatrixoma corresponds to a well-defined tumor proliferation, consisting of areas of eosinophilic cells with a mummified appearance, sometimes associated with areas of monomorphic basaloid cells [1]. Moreover, hairs, calcifications, foci of necrosis, and multinucleated giant cells are commonly found [6].

Malignant pilomatrixomas are extremely rare. They were first described in 1980 by Lopansri and al, and there are only few articles available reporting this type of disease. [7,8,9].

Differential considerations of breast pilomatrixoma with benign and malignant breast lesions can be very challenging. It includes calcifying lesions of the skin (seborrheic keratosis and inclusion cysts), fibrocystic changes (usual ductal hyper-

Fig. 3 – Ultrasonography of the left breast showing a poorly delineated hypoechoic nodular area with significant acoustic shadowing, related to microcalcifications. This lesion is located in the lower outer quadrant, at a few millimeters from the skin surface and measuring 3.5 cm in diameter.

Fig. 4 – Histopathological studies showing Mummified squamous epithelium, with clusters of basophilic squamous cells in the periphery without any atypia or mitosis. HESx100 (A); HESx200 (B)
plasia adenosis, apocrine metaplasia), lobular neoplasia, papillomas calcified fibroadenomas, fatty necrosis and invasive ductal carcinoma. Because all of them can appear as nodular opacities with pleomorphic calcifications on mammography. Only histological examination, with a core-needle biopsy, has been shown to be an effective and safe technique for the diagnosis of breast nodules, suspicious of malignancy, classified as BIRADS 4 and 5 [25] and should be performed to obtain a pre-surgical diagnosis [10].

However, given the few cases reported in the literature, it seems recommended to perform a total surgical excision of any pilomatrixoma diagnosed [1].

Conclusion

In conclusion, the intrammary localization of pilomatrixoma is extremely rare and has been reported in few cases in the literature. However, this location presents a challenge for differential diagnosis with mammary nodules showing calcifications on mammograms. The standard examination by mammography and ultrasound should be followed by a needle biopsy to establish an accurate preoperative diagnosis.

Ethics approval and consent to participate

Oral and signed consent was obtained from the patient concerned. The study was conducted anonymously.

Availability of data and materials

The data sets are generated on the data system of the CHU hassan II of Fes, including the data of the anatomopathological analysis.

Funding

No source of funding was received

Consent form

I’m LAMYAE CHABBAR. I give my consent for information about myself/my child or ward/ my relative (circle as appropriate) to be published in RADIOLOGY CASE REPORTS.

I understand that the information will be published without my/my child or ward’s/my relative’s (circle as appropriate) name attached, but that full anonymity cannot be guaranteed. I understand that the text and any pictures or videos published in the article will be freely available on the internet and may be seen by the general public. The pictures, videos and text may also appear on other websites or in print, may be translated into other languages or used for commercial purposes. I have been offered the opportunity to read the manuscript.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.radcr.2021.06.007.

REFERENCES

[1] Rousselot C, Tourasse C, Samimi M, Degand P, Dénier JF, Michenet P. Pilomatrixomes mammaires révélés par des microcalcifications à la mammographie: à propos de deux cas. Journal de Radiologie 2007;88(7-8):978–80.
[2] Nori J, Abdulcadir D, Giannotti E, Calabrese M. Pilomatrixoma of the breast, a rare lesion simulating breast cancer: a case report. J Radiol Case Rep 2013;7(10):43.
[3] Imperiale A, Calabrese M, Monetti F, Zandrino F. Calcified pilomatrixoma of the breast: mammographic and sonographic findings. Eur Radiol 2001;11(12).

[4] Imperiale A, Calabrese M, Monetti F, Zandrino F. Calcified pilomatrixoma of the breast: mammographic and sonographic findings. Eur Radiol 2001;11:2465–7.

[5] Reynaud P, Orliaguet T, Robin YM, et al. Mammary pilomatrixoma clinically mimicking carcinoma. Ann Pathol 1997;17:213–14.

[6] Pascual A, Casado I, Colmenero I, Pelayo A, Asenjo JA. Fine needle aspiration cytology of pilomatrixoma of the breast. Acta Cytol 2000;44(2):274–6 PMID: 10740619.

[7] Niedermeyer HP, Peris K, Höfler H. Pilomatrix carcinoma with multiple visceral metastases. Report of a case. Cancer 1996;77(7):1311–14 PMID: 8608508.

[8] Mikhaeel NG, Spittle MF. Malignant pilomatrixoma with multiple local recurrences and distant metastases: a case report and review of the literature. Clin Oncol (R Coll Radiol) 2001;13(5):386–9 PMID: 11716236.

[9] Sau P, Lupton GP, Graham JH. Pilomatrix carcinoma. Cancer 1993;71(8):2491–8 PMID: 8453573.

[10] Bianchi S, Giannotti E, Vanzi E, Marziali M, Abdulcadir D, Boeri C, et al. Radial scar without associated atypical epithelial proliferation on image guided 14-gauge needle core biopsy: analysis of 49 cases from a single-centre and review of the literature. Breast 2012;21(2):159–64 PMID: 21944431.