Case Report

Axillary vascular malformation visualized on mammogram: A case report✩✩

Pranjali Joshi, MBBS, MD*, Anamika Kumar, MBBS, MD, DNB, Satish Chaitanya, MBBS, MS, Prateek Sharda, MBBS, MS, Bina Ravi, MBBS, MS, MNAMS,FACS,FICS,FRCS, Anjum Syed, MBBS, MD, FRCSR

Integrated Breast Care Centre, All India Institute of Medical Sciences, Rishikesh, 249203, India

ARTICLE INFO

Article history:
Received 9 April 2022
Revised 7 May 2022
Accepted 12 May 2022

Keywords:
Breast
Mammography
Vascular malformation
Ultrasoundography
Computed tomography angiography

ABSTRACT

Chest wall lesions can mimic masses on mammograms and can cause diagnostic difficulty in interpretation. Here, we report a case of an axillary and retro-pectoral vascular malformation visualized on mammography in a 67-year-old patient presenting with fullness in the right axilla and right supraclavicular region. Mammography, ultrasonography (US), and computed tomography (CT) angiography of the patient were done to make the final diagnosis.

© 2022 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

Benign chest wall lesions are rare lesions and can originate from any underlying structure such as the muscles, underlying nerves, vessels, osseous or adipocytic tissue, or other mesenchymal structures [1]. Vascular chest wall lesions are extremely uncommon, of which venous malformations (VM) are the most common type of congenital malformation with an estimated incidence of 1%, arising due to abnormal vasculogenesis or angiogenesis [2]. When large enough, they may project into the overlying breast tissue and be visible on mammograms causing a diagnostic dilemma.

Case presentation

Clinical presentation

A 67-year-old female patient presented to the breast clinic with complaints of swelling in the right supraclavicular region for 1 month followed by swelling in the right axilla. There

Abbreviations: US, ultrasonography; CT, computed tomography; VM, venous malformation; DBT, digital breast tomosynthesis; FNAC, fine needle aspiration cytology; MRI, magnetic resonance imaging; NCCT, noncontrast computed tomography; DM, digital mammography.

✩✩ Competing Interests: None.
*f Corresponding author at: Integrated Breast Care Centre, All India Institute of Medical Sciences, Rishikesh, 249203, India.
E-mail address: pranjali29@gmail.com (P. Joshi).

https://doi.org/10.1016/j.radcr.2022.05.032

1930-0433/© 2022 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/)
was also swelling and redness in the right breast. She had no known personal or family history of breast or ovarian malignancy. She was a known hypertensive but was not taking regular medication. There was no known history of diabetes mellitus, hyperlipidemia, or other comorbidities. No history of prior breast trauma or history of breast surgery was elicited.

**Examination findings**

An area of induration and erythema was seen in the right breast in the lower inner and inner central region with fullness in the right axilla and right supraclavicular region. No lump was palpated in either breast. There was no evidence of nipple retraction or nipple discharge in either breast.

**Imaging findings**

On 2D mammography, a high-density lobulated irregular lesion was seen in the right axillary region. Digital breast tomosynthesis (DBT) was done which showed high-density tubular serpiginous channels in the axilla extending up to the upper inner quadrant of the breast, raising suspicion of a vascular malformation (Fig. 1). Ultrasound with Doppler showed dilated vascular channels in the axillary region extending into the infraclavicular and supraclavicular regions with color flow on Doppler evaluation (Fig. 2). CT angiography of the right upper limb was advised which showed an irregular soft tissue lesion in the right retro-pectoral region extending to the axilla, subcutaneous plane, the infraclavicular and supraclavicular regions with areas of contrast enhancement in the venous phase. No phleboliths were seen (Fig. 3). A final diagnosis of low flow venous malformation was made.

An area of architecture distortion with amorphous microcalcifications was also seen in the lower inner quadrant on mammography. US showed an area of heterogeneous breast parenchyma at 5 o’clock position (Fig. 4). US-guided fine needle aspiration cytology (FNAC) and Trucut biopsy was done which was diagnostic of epithelial hyperplasia with apocrine changes.

The patient was advised of a short-term follow-up for the breast lesion and was conservatively managed for the venous malformation.
Fig. 2 – Correlative US of the axillary lesion showed multiple vascular channels in the right axilla, infraclavicular and supraclavicular regions with few of them showing color uptake on Doppler study (in B). Spectral tracing of these vascular channels did not show any definite pattern (image C).

Fig. 3 – NCCT of the patient showed mixed density serpiginous channels in the axilla without any calcification that might suggest phlebolith (solid arrow in image A). Venous phase imaging showed few of these channels with contrast uptake (solid arrow in image B).

Discussion

Chest wall lesions in the retro-pectoral region or submammary location can frequently be misdiagnosed as a tumor [3]. They can be of vascular, adipocytic, osseous, or fibro histiocytic origin and may be symptomatic or asymptomatic. To the best of our knowledge, 4 cases of vascular malformation seen on mammography have been reported [1–5]. Three of them were VM of the pectoral muscle, while 1 was an interpectoral VM. To our knowledge, ours is the first case of a retro-pectoral VM extending to the subcutaneous plane, visualized on mammography. It is important to recognize vascular malformation so that inadvertent biopsy can be avoided because biopsy in such lesions may lead to catastrophic consequences.

As per the classification of the International Society for the Study of Vascular Malformations, vascular anomalies are divided into vascular tumors and vascular malformations. Low-flow vascular malformations comprise capillary, lymphatic, venous, or combined arteriovenous malformations, of which venous malformations are a major subcategory [6]. VMs are most commonly found in superficial locations within the head and neck (40%), trunk (20%), or limbs (40%) [7].

On imaging, they may be seen as serpiginous tubular channels on mammography and ultrasonography, with or without low-velocity flow on Doppler and may show phleboliths which, if found, are quasi-pathognomonic [5].

On CT angiography, VMs are seen as hypodense or heterogeneous lesions with slow and peripheral enhancement after contrast injection, which was also found in our case [8]. CT is useful for defining the extent and for confirming phleboliths.

Magnetic resonance imaging (MRI) is the modality of choice in such cases, but it could not be done for our patient due to the patients’ financial constraints. On MR imaging, VMs are seen as hypo to isointense lesions on T1W sequences and hyperintense on T2W sequences. Post gadolinium T1W sequences will be useful to evaluate the circulatory supply of the VM [8]. The available treatment options include sclerotherapy with absolute ethanol, surgical resection, or laser therapy for superficial lesions [9].
REFERENCES

that patient I

Patient or

ings

Chest

Conclusion

In our patient, the findings of tubular serpiginous channels showing color flow on Doppler study and peripheral slow enhancement on CT angiography were key to making the correct diagnosis.

Chest wall vascular malformations may be visible on mammography; hence, it is important to be aware of extramammary differentials in cases with unusual mammographic findings before proceeding for biopsy. Additional imaging with CT or MRI must be carried out for confirming the diagnosis.

Patient consent

I state that written and informed consent was taken from the patient for publication of this case. The patient was informed that no personal details will be revealed in the publishing of this case.

REFERENCES

[1] Metaxa L, Sauris TD, Dani S. Vascular chest wall lesion mimicking a breast tumor on screening mammograms: report of a case. Breast J 2019;25(6):1257–9.

[2] Colletti G, Ierardi AM. Understanding venous malformations of the head and neck: a comprehensive insight. Med Oncol 2017;34(3):42.

[3] Kim DJ, Son EJ, Hong SW, Kim E-K, Kwak JY, Oh KK, et al. Interpectoral venous angioma presenting as a breast mass. J Ultrasound Med 2008;27(3):477–81.

[4] Perugini G, Bonini G, Giardina C, Mapelli L. Cavernous hemangioma of the pectoralis muscle mimicking a breast tumor. Am J Roentgenol 1994;162(6):1321–2.

[5] El Khoury M, Bejjani J, Trop I, Labelle M, Mesurolle B. Venous malformation of the pectoral muscle depicted on mammogram. Clin Imaging 2020;63:57–9.

[6] Lee BB. Venous malformation and haemangioma: differential diagnosis, diagnosis, natural history and consequences. Phlebology 2013;28(suppl 1):176–87.

[7] Olivieri B, White CL, Restrepo R, McKeeon B, Karakas SP, Lee EY. Low-flow vascular malformation pitfalls: from clinical examination to practical imaging evaluation—part 2, venous malformation mimickers. Am J Roentgenol 2016;206(5):952–62.

[8] Dubois J, Soulez G, Oliva VL, Berthiaume M-J, Lapiere C, Therasse E. Soft-tissue venous malformations in adult patients: imaging and therapeutic issues. Radiographics 2001;21(6):1519–31.

[9] Hage AN, Chick JFB, Srinivasa RN, Bundy JJ, Chauhan NR, Acord M, et al. Treatment of venous malformations: the data, where we are, and how it is done. Tech Vasc Interv Radiol 2018;21(2):45–54.