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Case Report: Slow-Flow Venous Malformation In The Breast: A Case Report With Extended Chest Wall Involvement

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Abstract

Introduction: Vascular abnormalities in the breast are rare and include various conditions such as congenital malformations and tumors like hemangiomas, lymphangiomas, and angiosarcomas. These conditions can often be mistaken for breast cancer due to similar clinical and imaging features(6) . The identification of a venous malformation in a despite its rarity in breast tissue, emphasizes the necessity for radiologists to maintain a high index of suspicion for vascular anomalies when interpreting imaging results.The imaging modalities utilized including mammography, ultrasound ,and MRI provided comprehensive insights into the nature of the lesions, allowing for a nuanced understanding of their characteristics. (Pdf eurorad) This case report examines a rare presentation of a slow-flow venous malformation in the left breast and anterolateral chest wall, emphasizing the importance of multimodal imaging for accurate diagnosis and management.

Case Presentation: A 79-year-old female presented with a progressively enlarging left breast mass with peau d'orange appearance. Imaging studies including ultrasound, CT, MRI, and angiography, confirmed a large slow-flow venous malformation with multiple thrombosed venous lakes extending into the chest wall and upper limb. No evidence of malignancy was noted. The patient had associated conditions including thrombosis of the left axillary vein and pleural effusion.

Conclusion: This case underscores the importance of thorough imaging evaluation in diagnosing slow-flow venous malformations and the necessity of a multidisciplinary approach for optimal management.

Keywords: Slow-flow venous malformation, breast mass, thrombosis, MRI, CT angiography.

Introduction

Background

Slow-flow venous malformations are congenital vascular anomalies involving various anatomical regions, including the breast and chest wall [1]. These malformations can present as painless progressively enlarging masses, often associated with venous stasis, thrombosis, and secondary complications [2]. The rarity of these lesions in the breast underscores the need for detailed radiological assessment to differentiate them from malignancies [3].

Case Presentation

Patient History

A 79-year-old female with a history of left breast mass and previous lumpectomy (suspected lipoma) presented with progressive left breast enlargement, peau d'orange appearance, and associated axillary swelling. She also reported shortness of breath and was found to have oxygen desaturation.

Timeline

Date	Event
20 years ago	Left breast lumpectomy for suspected lipoma
28/10/2024	Initial CT and ultrasound imaging
07/11/2024	CT upper limb angiogram confirming venous malformation
10/11/2024	MRI breast screening
08/12/2024	CT chest and malignancy screening

Diagnostic Assessment

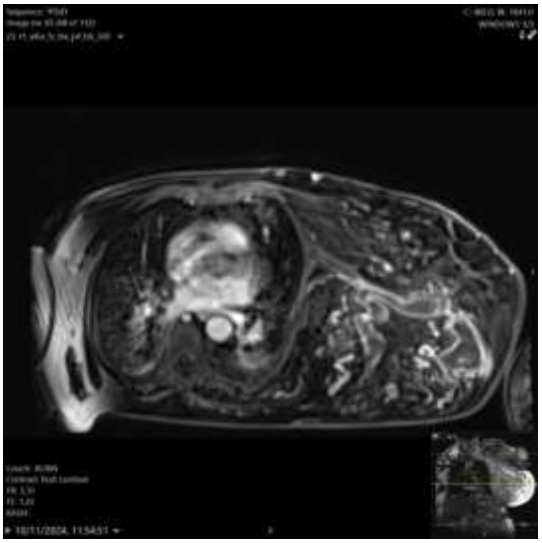
Ultrasound Findings (30/10/2024):

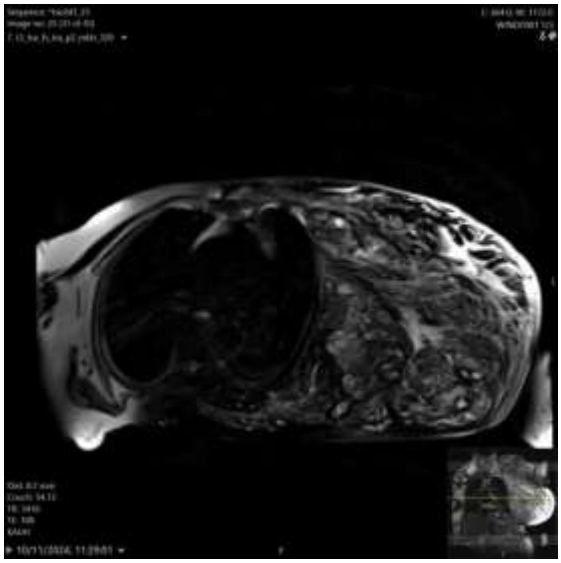
The ultrasound examination of the left breast revealed a large tubular anechoic lesion measuring 10.4 x 2.4 cm. Multiple dilated and tortuous anechoic vessels were also observed extending toward the lateral chest wall. No intrinsic vascularity was demonstrated within the lesion. The differential diagnosis includes a large slow-flow venous malformation or a giant hemangioma.

Figure 1: Targeted ultrasound to the area of concern in the upper outer left breast, confirms the presence of a large tubular anechoic lesion with intrinsic debris, overall measuring about 10.4 x 2.4 cm, with adjacent subcutaneous oedema and minimal skin thickening. Multiple dilated tortuous anechoic vessels are noted extending towards the area of skin bed ulcer/dressing in the lateral chest wall and prominent left axillary lymph nodes.

CT Upper Limb Angiogram (07/11/2024):
The examination identified a large venous malformation involving the left anterolateral chest wall and breast. The left axillary vein was found to be completely thrombosed, accompanied by multiple thrombosed venous lakes. Multiple tubular-like lesions containing phleboliths were also observed extending to the anterior chest wall and back. No arterial component was noted.

MRI Breast Screening (10/11/2024):
The evaluation revealed an extensive slow-flow venous malformation involving the left breast, chest wall, anterior mediastinum, and pericardium. Venous collaterals were noted to be draining into the internal mammary and lumbar veins. Importantly, no discrete abnormal enhancing mass suggestive of malignancy was identified.





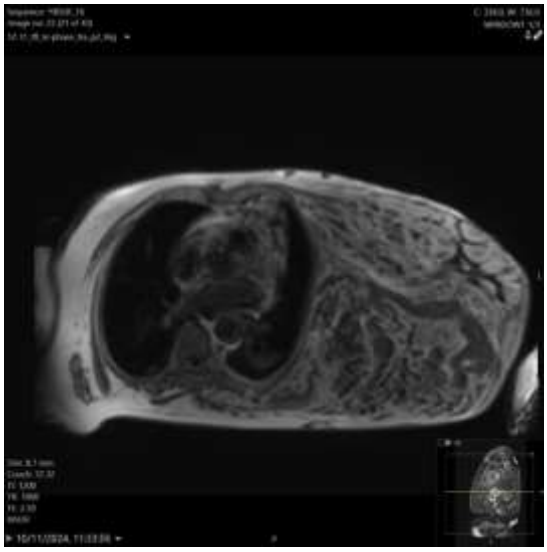



Figure 2: features of left antero-lateral chest wall and left breast slow flow venous malformation with no arterial component, the venous malformation shows multiple thrombosed venous lakes that are communicating with the completely thrombosed left axillary vein.

CT Chest (08/12/2024):

The assessment demonstrated a partially thrombosed vascular malformation involving the left chest wall. Additionally, multiple small pulmonary vascular malformations were observed bilaterally. The findings also included a left pleural effusion and partial atelectatic changes in both lungs.

Figure 4: There is revisualisation of the extensive left chest wall and into mediastinal complex partially thrombosed vascular malformation. Partial left lower lobe compressive atelectasis is seen, along with minimal subpleural atelectatic bands along the lateral and dorsal right lung. Multiple tiny/small serpentine, nodular and/or irregular foci are stable within both lungs. There is a small unilateral left pleural effusion, without pneumothoraces. Centimetre mediastinal and bilateral hilar lymph nodes are Revisualized.

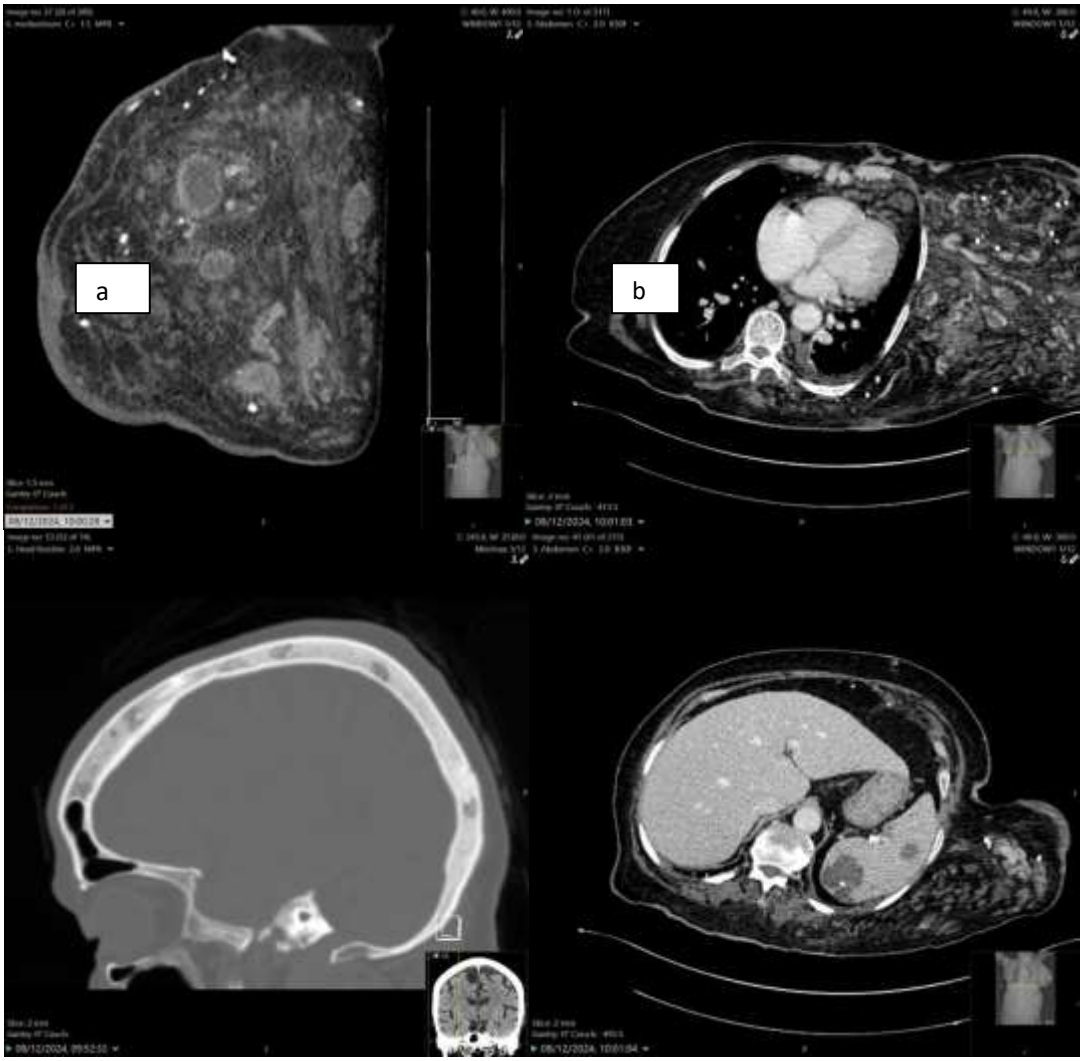


Figure 5: (a) Multiple calvarium non-specific lytic lesion with central calcification ,no cortical destruction, inner table and outer table is intact. (b) Re-visualisation of the multiple varying in size stable hypodensities with intramural calcifications likely representing haemangiomas versus lymphangiomas, some of which are mostly completely cystic and some are mixed solid and cystic..

Therapeutic Intervention

Anticoagulation therapy was initiated to address the left axillary vein thrombosis. Regular imaging follow-up has been planned to monitor the progression of thrombosis and identify potential complications. An interventional radiology consultation has been recommended to evaluate the feasibility of sclerotherapy or embolization. Symptomatic management includes pain control, wound care, and supportive therapy to address the pleural effusion.

Follow-up and Outcomes

The patient remains under close follow-up with planned imaging assessments. No new clinical symptoms have been reported, but the thrombosed venous malformation requires continued monitoring.

Discussion

Slow-flow venous malformations of the breast and chest wall are exceedingly rare [4]. The diagnosis and management of vascular abnormalities of the breast present unique challenges due to their rarity and the potential for misinterpretation as malignant lesions(7). Their clinical presentation can mimic malignant processes, necessitating comprehensive imaging evaluation [5]. Multimodal imaging, including ultrasound, MRI, and CT angiography, plays a crucial role in diagnosis and guiding management [2].Histological examination is essential for definitive diagnosis, as vascular lesions can display overlapping features that complicate the diagnostic process. This necessitates the use of specific immunohistochemical markers, such as D2-40, which is highly sensitive for lymphatic endothelial cells and can help distinguish lymphangiomas from hemangiomas and other vascular tumors.(7)

Treatment options for venous malformations should be individualized, considering factors such as symptomatology, lesion size, and anatomical location. While sclerotherapy may offer a minimally invasive approach to managing pain or discomfort, surgical excision may be warranted in certain cases to alleviate symptoms or for cosmetic reasons. (Pdf eurorad)

Also treatment can be conservative unless complications such as thrombosis or ulceration arise, where interventional procedures may be required [3].

Conclusion

This case highlights the diagnostic challenges of slow-flow venous malformations in the breast and the importance of multimodal imaging for differentiation from malignancy. A multidisciplinary approach, including interventional radiology and vascular specialists, is essential for optimal patient care.By fostering a comprehensive understanding of these rare entities, healthcare professionals can enhance patient outcomes through timely and appropriate management strategies. Overall, awareness and education regarding venous malformations can improve diagnostic accuracy and optimize treatment pathways in breast health management.

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