



Cavernous hemangioma of the breast: a case report

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Background: Hemangioma is a common benign tumor resulting from abnormal blood vessel growth but is infrequent in the breast. Preoperatively, it is challenging to diagnose breast hemangioma using clinical and conventional imaging modalities because of their lack of pathognomonic characteristics. An excisional biopsy can be used for tissue diagnosis in cases of diagnostic uncertainty.

Case presentation: The authors report a case of cavernous hemangioma of the breast in a 15-year-old adolescent female complaining of a rapidly enlarging firm and mobile lump in the right breast. Breast ultrasonography revealed a well-circumscribed, encapsulated, heteroechoic mass with smooth margins in the retroareolar region of the right breast. Subsequent excision of the lump revealed features of a cavernous hemangioma, and the follow-up was uneventful.

Discussion: Cavernous hemangioma of the breast is a rare entity, and its diagnosis poses a significant challenge for clinicians, as the lump may not be noticeable. The clinical diagnosis is challenging; therefore, imaging is required. Breast ultrasonography typically shows a hypoechoic lobulated mass with clear borders, although isoechoic and hyperechoic appearances are also possible. Breast mammography revealed a well-defined mass with areas of calcification. Surgical excision is often necessary when there is a discordance between imaging and histopathological findings, lesions greater than 2 cm, and atypical/malignant features.

Conclusion: Breast hemangiomas are rare benign tumors with nonspecific imaging features that require tissue sampling for diagnosis. Clinicians should be familiar with these characteristics to ensure proper management.

Keywords: biopsy, breast, hemangioma

Introduction

Breast hemangiomas is a rare, benign vascular tumor that constitutes 0.4% of all breast tumors^[1,2]. These tumors consist of dilated vascular channels lined with flattened endothelial cells devoid of atypia. Hemangiomas of the breast can be further classified into perilobular and nonperilobular subtypes and nonperilobular subtypes, further classified as capillary, cavernous, venous, or complex, with capillary and cavernous types. Perilobular hemangiomas are found in about 1.2% of mastectomy specimens and 11% of postmortem specimens in females^[3]. Cavernous hemangiomas, characterized by dilated blood vessels filled with erythrocytes, are the most common type, although few cases have been reported in the literature^[1,3].

Preoperative diagnosis of breast hemangiomas presents challenges due to the lack of pathognomonic characteristics in

HIGHLIGHTS

- Breast hemangiomas are rare benign vascular tumors.
- Imaging techniques such as mammography, ultrasonography, and MRI imaging can aid preoperative diagnosis.
- Biopsy and histopathological studies are crucial for differentiation from angiosarcoma.
- Clinicians may face difficulties diagnosing benign tumors, leading to delayed treatment.
- Successful surgical excision serves as treatment and confirmation of diagnosis.

conventional imaging modalities^[2]. Furthermore, the wide age distribution, the diverse range of potential differentials for breast masses in adolescents, and their impalpable nature can pose challenges in clinical diagnosis, making clinicians prone to overlook the possibility of a breast hemangioma. This underscores the need for heightened vigilance to prevent unnecessary investigations and complications. This case was reported as per the Surgical CAse REport (SCARE) Checklist^[4].

Case presentation

A 15-year-old adolescent female visited our surgical clinic with a history of a right breast lump for the past 6 months. Although the lump remained relatively stable in size during this period, it underwent rapid enlargement over the previous 4–5 weeks. Notably, the lump was not accompanied by pain, and there were no additional complaints related to the breast. A nontender, firm, and mobile breast lump was observed on clinical examination without skin discoloration or nipple discharge/retraction. The left breast was normal on palpation.

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Bilateral breast ultrasonography (USG) revealed a well-circumscribed, encapsulated heteroechoic mass with smooth margins in the retroareolar location measuring $5 \times 5 \times 3.5$ cm in the right breast suggestive of a breast hamartoma. Internal echogenic and hypoechoic components were observed; however, no calcium was observed. Minimal internal vascularity was observed. The rest of the breast showed normal fibroglandular parenchyma. Skin and nipple-areolar complexes were normal. No architectural distortion, calcifications, or axillary lymphadenopathy was observed. In contrast, the left breast showed normal findings on imaging. Other imaging modalities like mammography, MRI, and preoperative evaluation with core needle biopsy could not be done due to unavailability and financial constraints. The patient had no personal or family history of breast or ovarian cancer.

The patient underwent breast lump excision. The lump was completely excised and sent for histopathological examination. The gross surgical specimen revealed a globular, capsulated, smooth, dark brown soft tissue measuring $5.5 \times 3.5 \times 2$ cm. The cut surface was solid, homogeneous, dark brown to red, and spongy, with slit-like areas.

Microscopic examination revealed the proliferation of well-differentiated blood vessels of varying sizes, with some interconnected within the stroma. Vascular spaces were filled with blood and separated by connective tissue stroma. However, cytological atypia, hemorrhage, mitosis, and necrosis were not observed. The preoperative diagnosis, aided by USG of the breast, suggested a hamartoma of the breast, while the postoperative histopathological diagnosis confirmed it to be a cavernous hemangioma. The patient experienced an uneventful post-operative period. On a 6-month follow-up, the patient was fine and showed no clinical or radiological recurrence of the lump confirmed by USG of the breast (Figs 1–3).

Discussion

Although hemangioma is a common benign tumor resulting from abnormal blood vessel growth, breast hemangioma is rare. It has several categories, including perilobular hemangioma, hemangioma (capillary, cavernous, complex, and venous types), and angiomatosis^[3].

Although the most common type of breast hemangioma, cavernous hemangioma of the breast, is a rare entity, its diagnosis poses a significant challenge for clinicians as the lump may not be noticeable^[2,5]. The primary clinical importance of benign vascular lesions is that they must be distinguished from angiosarcoma^[3]. In our case, a painless palpable breast lump was present, prompting imaging and surgical intervention.

Breast hemangiomas have been reported in patients of all age categories, ranging from 18 months to 82 years^[6–8]. Cavernous hemangioma tends to be grossly well-circumscribed, with a dark red or brown appearance. Microscopically, dilated capillary vessels were prominent in some areas of calcification^[3,9].

The clinical diagnosis of cavernous hemangioma of the breast is challenging and is usually aided by imaging modalities such as mammography, USG, and MRI. Breast hemangiomas are generally less than 2 cm, whereas mammary angiosarcomas are typically larger than 2 cm^[3,5]. However, size is not a rule for differentiating between the two. Core needle biopsies performed for other reasons have revealed incidental vascular lesions in patients^[10].



Figure 1. Macroscopic view of an irregularly demarcated lesion, $5.5 \times 3.5 \times 2$ cm, with a hemorrhagic cross-sectional surface, in serial sections of partial mastectomy material.

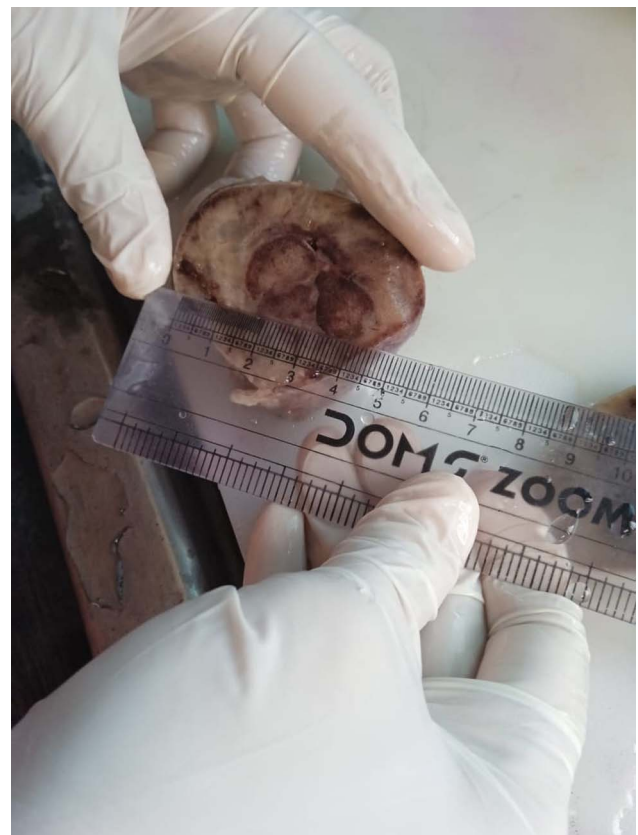


Figure 2. Macroscopic view of an irregularly demarcated lesion, $5.5 \times 3.5 \times 2$ cm, with a hemorrhagic cross-sectional surface, in serial sections of partial mastectomy material.

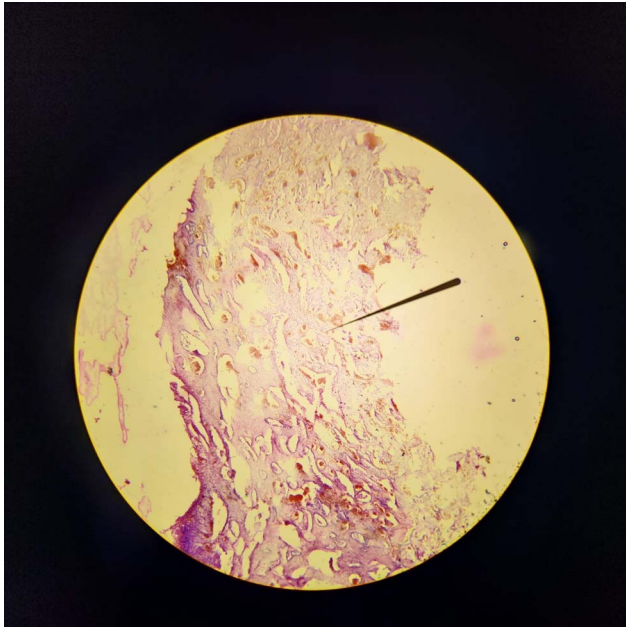


Figure 3. The microscopic section depicts well-differentiated blood vessels filled with blood and separated by connective tissue.

Breast USG may reveal a hypoechoic, lobulated mass with well-defined borders, although it can also appear isoechoic or hyperechoic. Breast mammography typically shows a well-defined mass with some areas of calcification^[3,11]. Although the findings are nonspecific and depend on the size and subtype of the hemangioma, MRI helps characterize the mass lesion and evaluate the extent of its spread. Breast hemangiomas typically appear as circumscribed masses with an intermediate signal on T1-weighted imaging and an intermediate-to-high signal on T2-weighted imaging. MRI features may be helpful in suspicious cases to differentiate from malignancy; however, the specificity is low. Dynamic, contrast-enhanced MRI, in which hemangiomas show an early and diffuse enhancement pattern, can aid in accurately determining the size and distribution of the lesion^[5,12].

If diagnostic uncertainty exists, excisional biopsy is recommended, as the tumor may mimic angiosarcoma. Further surgical intervention may be necessary based on the biopsy findings^[10]. Surgical excision is often necessary when there is discordance between imaging and histopathological findings, lesions greater than 2 cm, and in the presence of atypical/malignant features^[3,8].

Differential diagnoses include benign lesions such as other hemangiomas, fibroadenoma, lipoma, and breast cysts, as well as malignant lesions like angiosarcoma and mucinous carcinoma^[3,12,13]. Preoperative differentiation between benign lesions can usually be done by clinical features, USG and mammography. Differentiation from angiosarcoma is paramount, and imaging aids in achieving this. However, it cannot replace the necessity of biopsy and histopathological studies. Angiosarcomas are more commonly intraparenchymal, typically larger than 2 cm, and reveal atypical, proliferating blood vessels with irregular shapes and sizes. They exhibit nuclear atypia and increased mitotic activity^[3,13].

In diagnostic dilemmas, novel markers, such as the Ki-67 proliferation rate, have been proposed to distinguish between

low-grade angiosarcoma and hemangioma. Although the Ki-67 rate is significantly higher in low-grade angiosarcomas than in hemangiomas, its utility in distinguishing individual cases is uncertain^[14].

Conclusion

Breast hemangioma is a rare benign tumor with nonspecific imaging features that leads to a broad differential diagnosis, including benign and malignant lesions, often necessitating tissue sampling for definitive diagnosis. Clinicians should be familiar with their imaging characteristics, considering it as a possible diagnosis, and facilitating radiologic-pathologic concordance for proper clinical management.

Ethical approval

Ethical approval is exempt at the authors institution (Seti Provincial Hospital).

Consent

Written informed consent was obtained from the patients' parents/legal guardians for publication and for any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal upon request.

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Author contribution

S.A. and O.P.B.: study concept, data collection, and patient management; O.P.B. and P.B.: writing – original draft preparation and editing; S.A.: senior author and manuscript reviewer. All the authors critically reviewed, revised, and contributed to the final manuscript. All authors have read and approved the final manuscript.

Conflicts of interest disclosure

All the authors certify that they have no competing interests to declare that are relevant to the content of this article.

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