Case Report

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Breast Hemangioma Evaluation with MRI: A rare case report

Aslan et al. Breast Hemangioma Evaluation with MRI

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Abstract

Vascular tumors are rare in the breasts, and the most common forms include hemangiomas and angiosarcomas (1). Hemangiomas are rare benign vascular tumors. Most of them are asymptomatic and nonpalpable clinically, and the vast majority of such lesions are detected incidentally by mammography. Breast hemangiomas are difficult to diagnose using conventional imaging modalities since their imaging findings are variable.

The following is a case presentation of an asymptomatic forty-five year old female patient who was diagnosed with a rare hemangioma. Physical examination, ultrasonography (US) and mammographic examination were normal. Dynamic contrast enhanced MRI showed a non-mass pathologic enhancement. After a short-term follow up, control MRI was taken and biopsy was planned due to the heterogeneous non-mass enhancement on MRI. We performed core needle biopsy with US guidance, resulting in benign findings. Because of radiology pathology discordance, we did a MR-guided wire localization followed by open surgical biopsy. Histopathologic evaluation revealed capillary hemangioma.

The imaging findings (US, Mammography and MR) of hemangioma are reviewed and described in this case report.

Key words: Breast, hemangioma, angiosarcoma, MRI

Introduction

Vascular tumors are rare in the breasts, and the most common forms include angiosarcomas and hemangiomas. Hemangiomas are usually seen in women aged 19 to 82(mean, 60 years)(2). Hemangiomas are usually found incidentally through imaging techniques of mammography, ultrasonography (US) or MRI(1).

In this case, the breast hemangioma was not visible on US and mammography and could not be differentiated from malignancy with MRI findings.

Case Presentation

A 45-year-old female patient was referred to our clinic for evaluation of MRI ~~images~~ taken at another hospital ~~medical center~~. There was a weak heterogeneous non mass contrast enhancement in the upper inner quadrant of right breast on dynamic contrast enhanced MRI (Figure 1-2).

She had no previous history of breast-related problems, radiation treatment, or family history of breast or ovarian cancer. The only complain was breast pain, and there was no skin color changes and no finding on physical examination of the breasts. Mammography and ultrasonography were performed at our clinic. There was a mass opacity in the upper outer quadrant on the mammograms, which was confirmed as a cyst on US ~~examination~~. No suspicious finding was present in the inner upper quadrant either with mammography and ultrasonography (Figure 3).

A follow-up appointment was scheduled for 3 months later. CC view mammogram and US of the right breast were negative ~~again~~. Therefore follow-up MRI was performed by using a 3-T MR imaging unit (Siemens Magnetom Verio) with the patient prone and breast positioned within a dedicated surface breast coil with seven-channel. The MRI images with the scanner were acquired using the following sequences: axial, fat-suppressed, and fast spin-echo T2-weighted imaging sequence and pre-contrast and post-contrast dynamic axial T1-weighted three-dimensional, fat-suppressed, fat-spoiled gradient-echo sequence.

The images were obtained before and after a rapid bolus injection of gadolinium-diethylenetriamine pent acetic acid (Magnevist; Schering, Berlin, Germany) at 0.1 mmol/kg of body weight, ~~delivered through an indwelling intravenous catheter followed by a 10-ml saline flush, which was also administered at a rate of 2 mL/s.~~

On the early phase of dynamic contrast MRI, non-mass heterogeneous pathologic enhancement, 4 cm in size was seen in this area, and the enhancement was continued and was more evident from the previous MRI on the delayed phase with type 2 kinetic curve (Figure 4). It was categorized as BI-RADS4 ~~lesion and biopsy was recommended~~.

A core biopsy with US was performed in taking account the MRI coordinates of the lesion resulted in benign findings as fibrocystic changes of the breast and sclerosing adenosis.

Because of the radiology-pathology discordance, we recommended second biopsy with MR guidance. Because the patient request was surgical excision we performed MRI-guided hook wire localization followed by open biopsy (Figure5a). Once the lesion was localized, the MR-compatible guide hook wire was introduced to the appropriate depth. After the appropriate location and depth was confirmed, a guide wire was deployed through the needle. After MRI,

a mammogram was taken at the CC position in order to understand the location and depth of the wire and to show its interference with the surrounding tissue and nipple. After the excision, specimen mammography was taken (Figure 5b).

In macroscopic evaluation of the ~~surgical~~ excision material, there was an irregularly demarcated lesion (Figure 6). In the histopathological evaluation numerous vascular spaces, randomly distributed within the breast tissue, and not showing anastomosis, were observed in the lesion (Figure 7a-7b). In the immunohistochemical study, there was positive staining in the vascular spaces distributed between the endothelial markers and the breast ducts (Figure8). Histopathological diagnosis of the lesion was capillary hemangioma.

Discussion and Conclusion

Benign vascular breast lesions including hemangioma and angiomatosis are rare (1). Angiosarcoma, which is one of the malignant vascular tumors and is a very aggressive tumor, is less common than benign vascular tumors (1). In the literature, there is no evidence that benign vascular tumors with or without atypia are upgraded to angiosarcoma afterwards (3,4). However, when hemangioma is detected by needle biopsy, surgical excision is preferred because the sample taken may coincide with the well-differentiated area of a possible underlying angiosarcoma (1).

It is very important to be able to make the differential diagnosis of hemangioma and angiosarcoma.

Breast hemangiomas have variable imaging features (5). Benign hemangiomas can occur in the breast parenchyma and are usually small and incidentally found on excisional biopsy for other lesions (4,6). Most common types are capillary and cavernous hemangioma (7).

Breast hemangiomas have nonspecific features on mammograms and usually there is no finding in these patients. Some hemangiomas may show a mass opacity with well-defined margins, with or without calcifications (8). On the US examination, hemangiomas might be seen as oval solid mass with circumscribed or microlobulated margins, and the echotexture can be hypoechoic, isoechoic or heterogeneous (8).

MRI demonstrates a variable appearance, depending on the size and subtype of the hemangioma. Hemangiomas are seen isointense with muscle on T1W and hyperintense on T2W MR images. Also we can see hypointense areas in the lesion because of the calcifications, phleboliths and fibrous tissues on T2W images. These features are important for the differentiation from malignancy. Dynamic contrast enhanced MRI is necessary for the determination of the lesion’s size and distribution. Hemangiomas have early and diffuse enhancement pattern on the dynamic contrast enhanced MRI.

The differential diagnosis of any type of hemangioma within the breast is well-differentiated angiosarcoma. Angiosarcoma is of two types, primary and secondary (9,10). In angiosarcoma, US and mammography may sometimes seem completely normal (11). The prognosis is poor.

As in our case, US and mammography findings may not be present, and hemangioma and angiosarcoma cannot be differentiated without tissue biopsy.

In some cases US and mammography cannot demonstrate the lesion especially the small ones. MRI is more sensitive to show the lesion. Hemangiomas enhance in early phase of dynamic

contrast enhanced MRI. Because of this feature and malignant potential of hemangioma surgical excision is recommended(12,13). In our case MRI enhancement pattern was mimicking malignancy and the lesion was seen in only MRI. Because of the radiology and pathology discordance, open surgical biopsy after needle wire localization with MR guidance was done to the patient.

In the breast hemangiomas imaging findings can mimic malignancy. Because of the potential malignancy risk in vascular breast tumors, surgical excision and follow-up with imaging procedures is recommended in hemangiomas.

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Main Points

1. Benign hemangiomas can occur in the breast parenchyma and are usually small and incidentally found on excisional biopsy for other lesions.
2. Hemangiomas are rare benign vascular tumors.
3. The differential diagnosis of any type of hemangioma within the breast is well-differentiated angiosarcoma.
4. Because of the potential malignancy risk in vascular breast tumors, surgical excision is recommended in hemangiomas.

Figure Legends

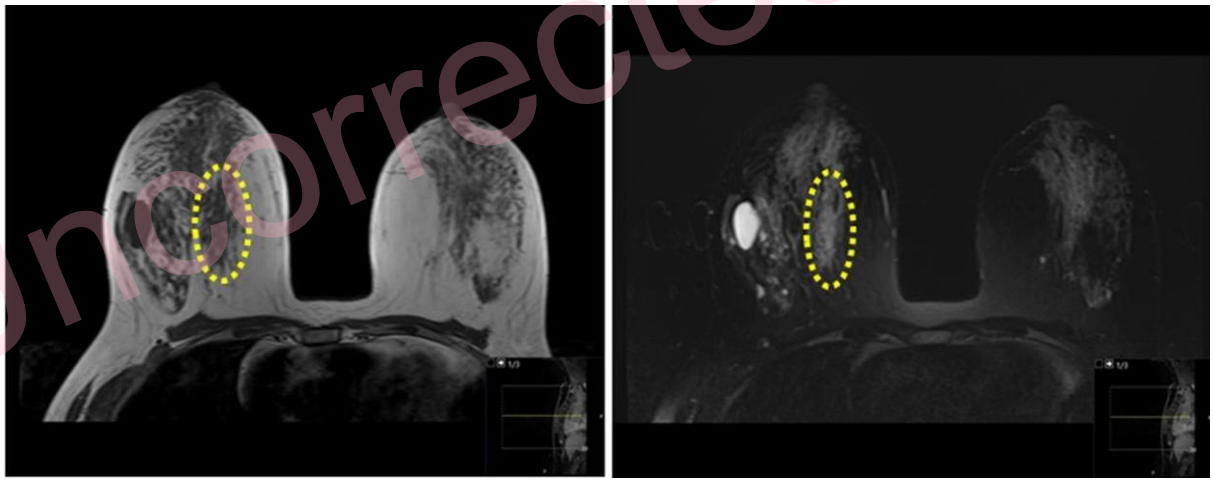


Figure 1: On the T1W and T2W MR images; circle indicates asymmetric tissue in the upper inner quadrant of right breast with equal signal to the breast tissue on T1W MR image and slightly hyperintense on T2W MR image.

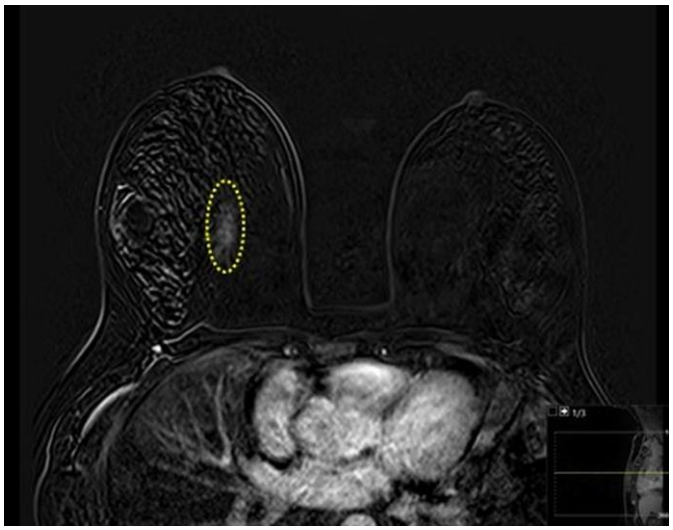


Figure 2: Dynamic contrast enhanced MR subtracted image showed a weak non-mass enhancement in upper inner quadrant of right breast.

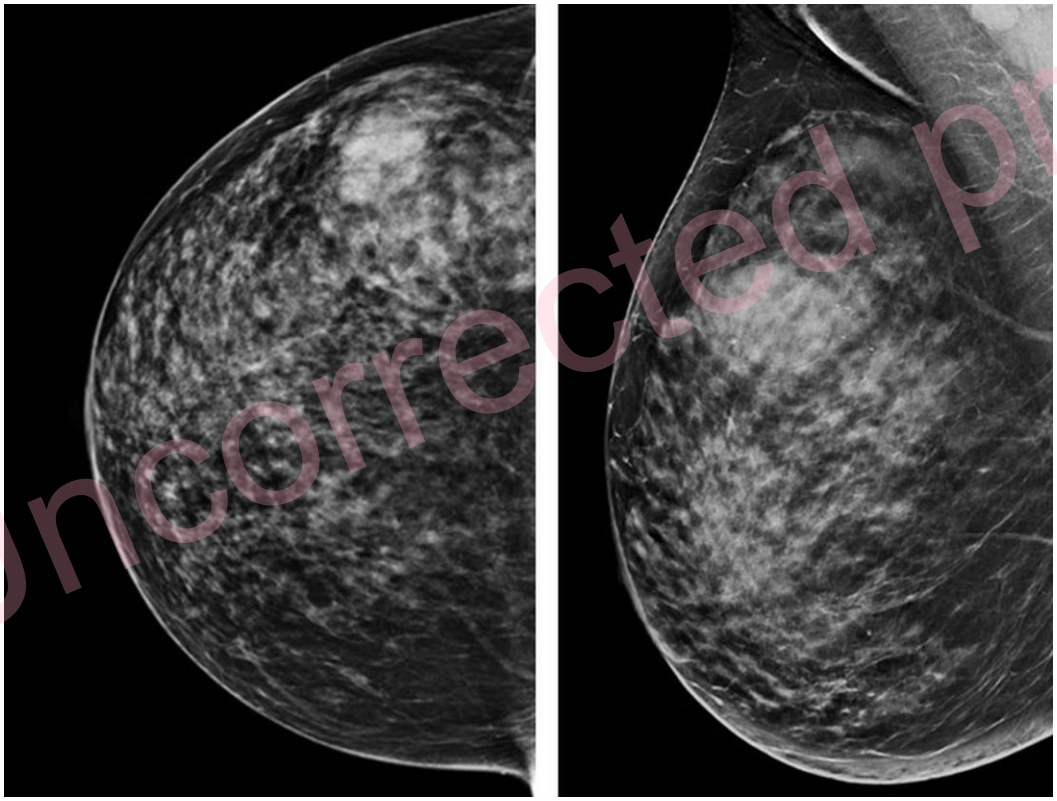


Figure 3: There was a mass opacity of a cyst that was shown with US in upper outer quadrant of right breast; there were no suspicious findings in the inner quadrant on mammography images.

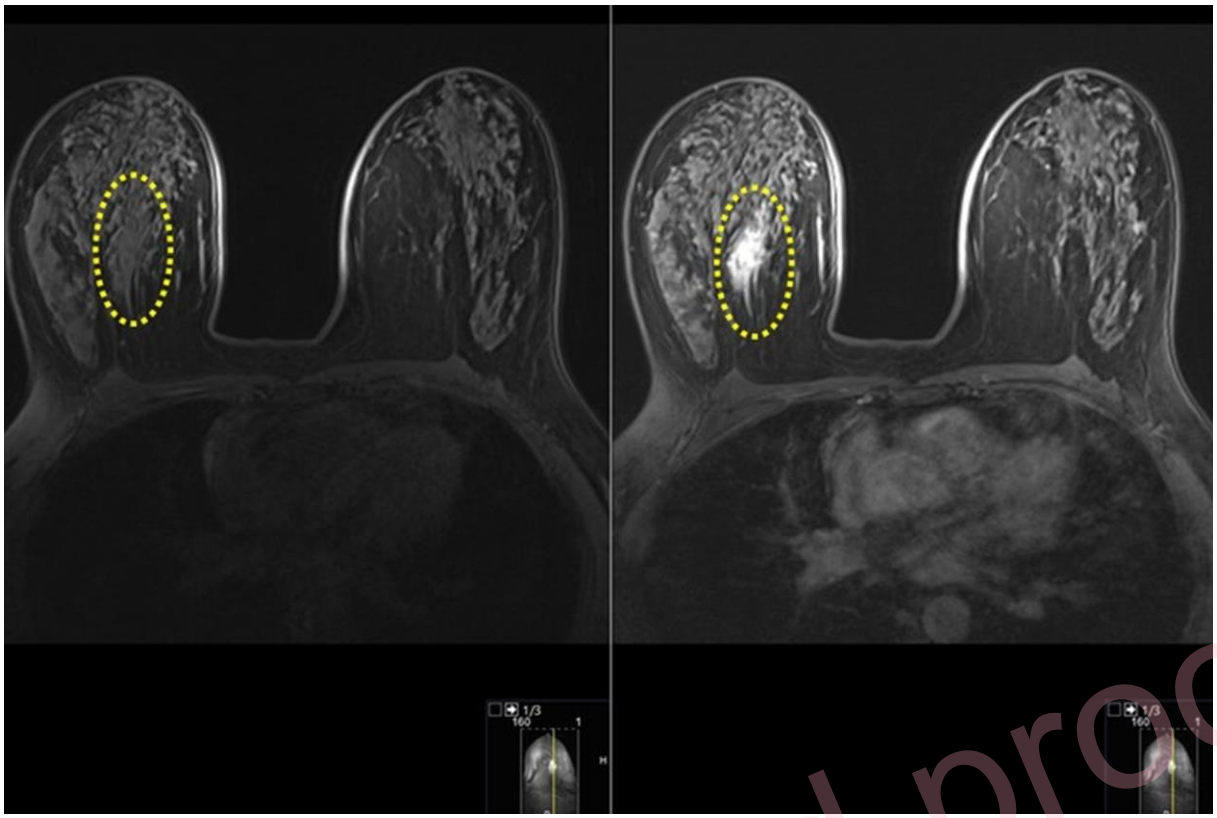
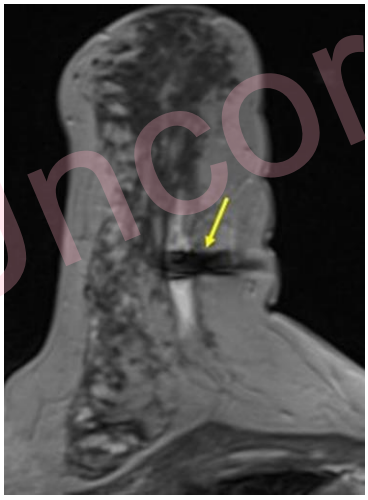


Figure 4: On precontrast T1W MRI, there was a 4 cm hypointense asymmetric tissue with irregular borders in the upper inner quadrant of the right breast. On the postcontrast T1W image nonmass enhancement was seen which became more evident in 3 month follow-up.



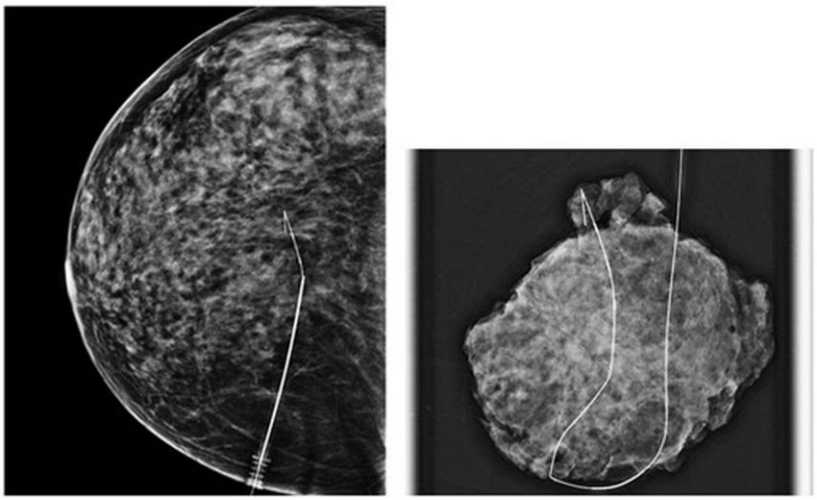


Figure 5a: Susceptibility artefact of hook wire is seen in the lesion on axial dynamic contrast enhanced T1W images. **Figure 5b:** Mammography shows localization of hook wire system and specimen mammography shows excised area with wire.

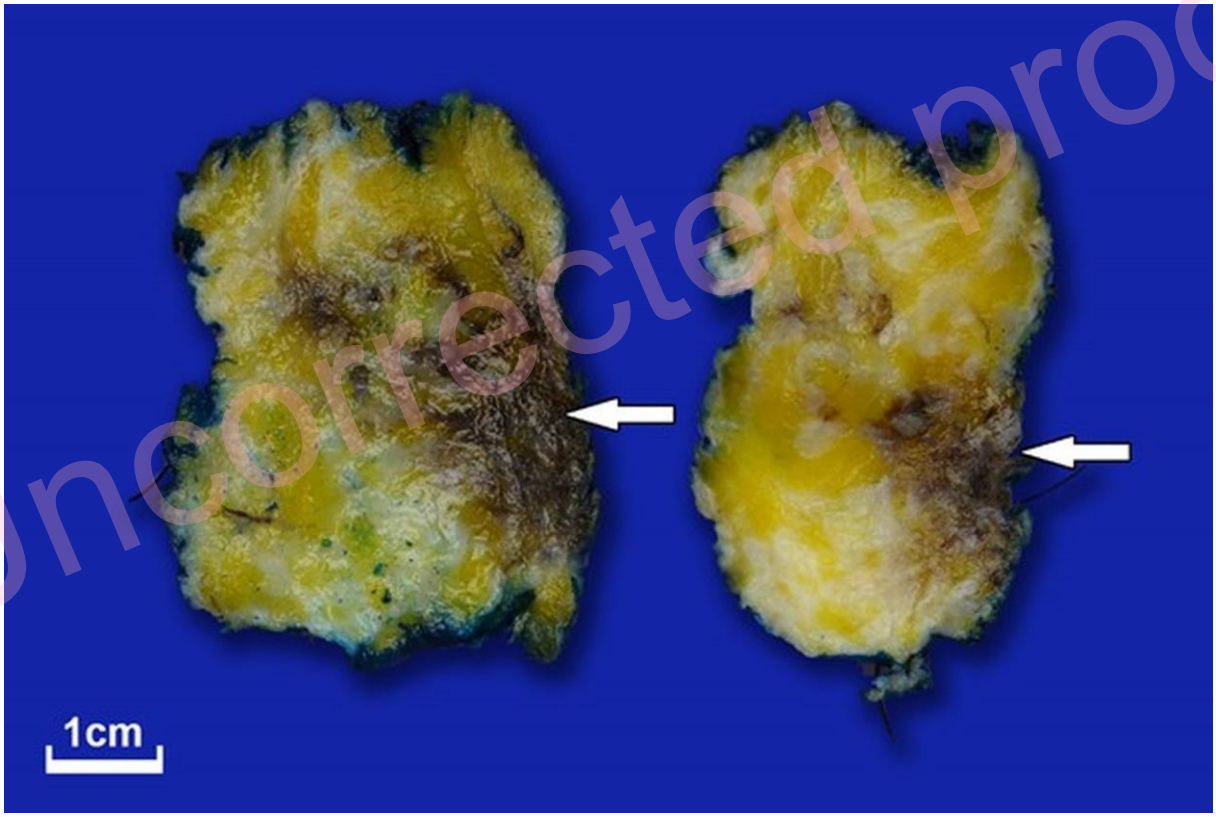


Figure 6: Macroscopic view of an irregularly demarcated lesion with a hemorrhagic cross-sectional surface, with a size of 4x1.8 cm, abutting the margin of surgical excision, in serial sections of partial mastectomy material.

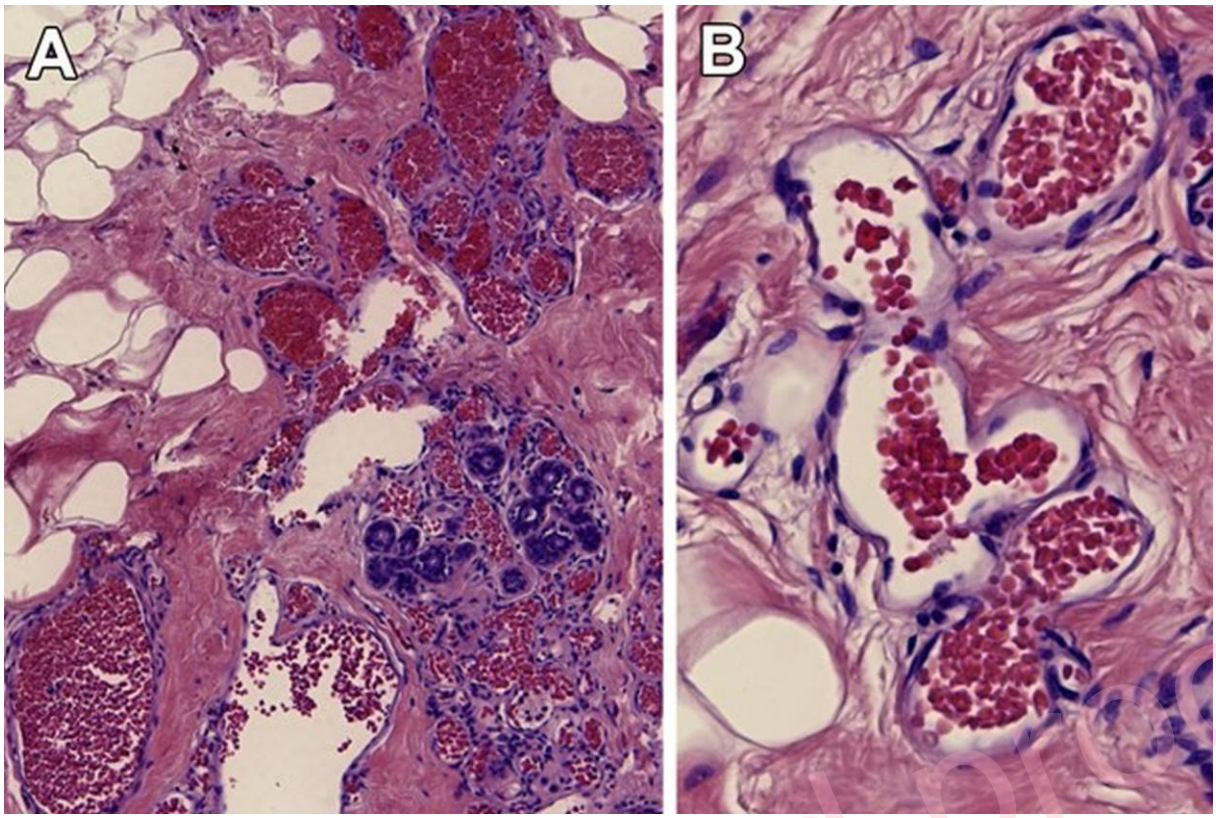


Figure 7: A: Vascular spaces scattered around the breast ducts, not showing significant anastomosis, containing erythrocytes (Hematoxylin & Eosin, 200x). **B:** Vascular spaces lined with a single layer of endothelium without signs of proliferation and atypia (Hematoxylin & Eosin, 400x).

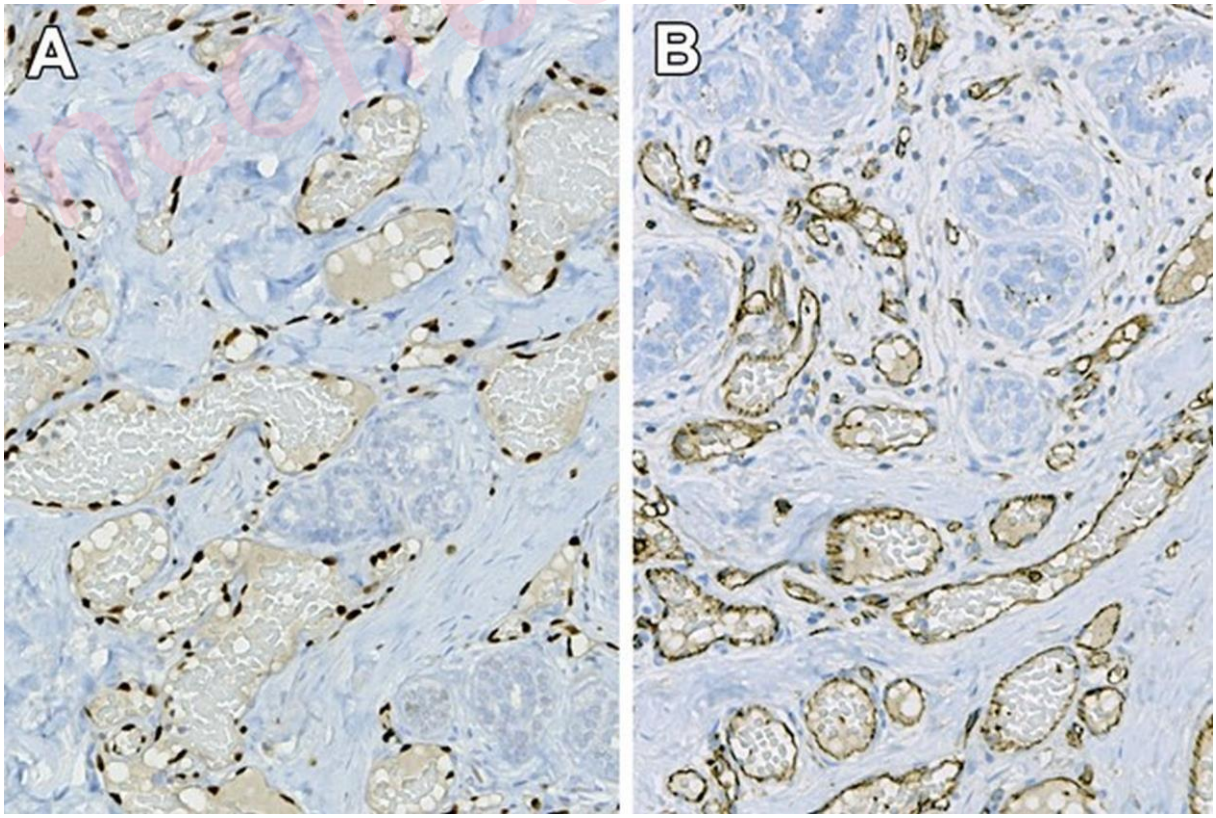


Figure 8: Positive staining in the vascular spaces distributed between endothelial markers and breast ducts and around the breast ducts in immunohistochemical study (**A.** ERG-1, nuclear positivity, 200x, **B.** CD31, cytoplasmic positivity, 200x)