

Case Report: Incidental Hemangioma of the Breast in MRI Breast Cancer Screening Program – Biopsy Leads to Postinterventional Bleeding in a 35-year-old Woman

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Abstract

Hemangiomas of the breast are rare, usually benign lesions with varying features in imaging, resulting in clinical challenges. Here we report on a 35-year old woman who presented with an unclear lesion of the right breast. MRI guided biopsy resulted in postinterventional hematoma, histopathological analysis showed a hemangioma. Because the findings in imaging and histology were consistent, we opted against a repeat (open) biopsy.

Case Description

A 35-year-old woman presented at the Center for Familial Breast and Ovarian Cancer of the University Hospital of Cologne. Due to previous diagnoses of her mother with breast cancer at age 43 and ovarian cancer at 46 and her grandmother with breast cancer at 45 years of age, she was enrolled in an intensified breast cancer screening program. Repeat routine contrast MRI imaging showed a smooth non-mass lesion with wash out in the right breast at the 6 o'clock position, gradually increasing in size to about 5mm. Breast density was classified ACR b, the lesion rated BIRADS IVa (risk of malignancy 2-10%), leading to the recommendation of ultrasound imaging and biopsy. Ultrasound evaluation and mammography allowed no clear discrimination of the lesion spotted in MRI. An MRI guided vacuum suction biopsy was scheduled and carried out in prone position. First, a contrast-enhanced dynamic T1w sequence was obtained. Here, the lesion sought is shown at 6 o'clock on the right (Image 1 and 2).

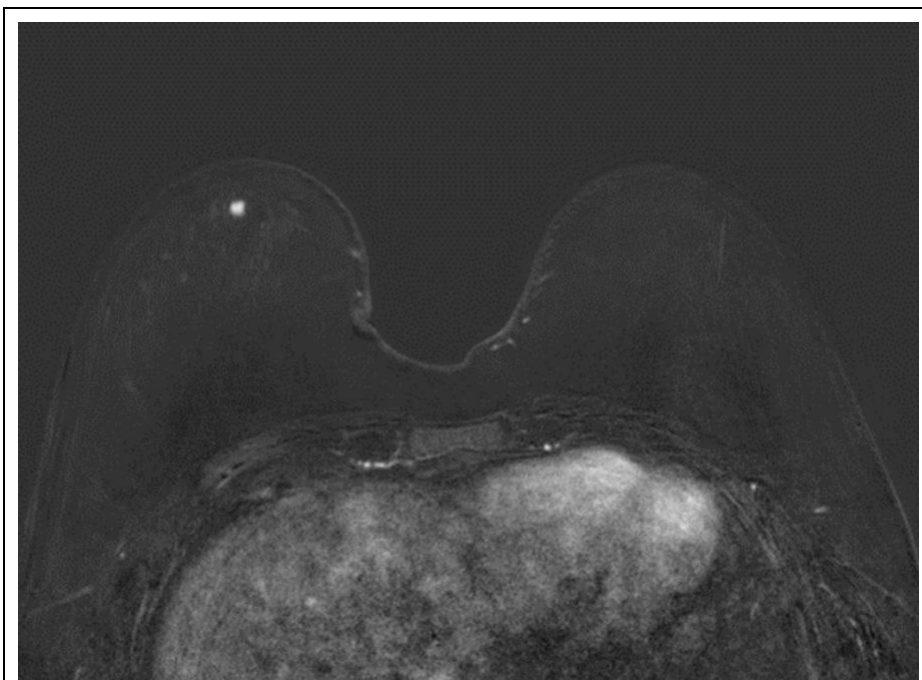


Image 1: Contrast enhanced T1w in subtraction technique, early dynamic phase: early arterial homogeneous contrast-enriched focal lesion, round, smooth border, measuring approx. 5 mm (BI-RADS IVa).

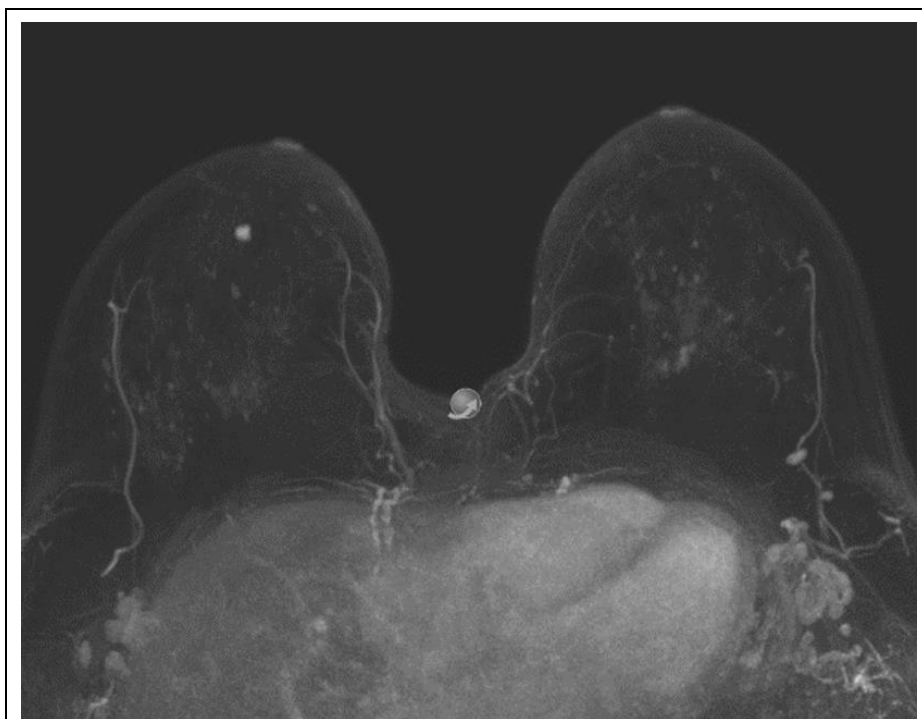
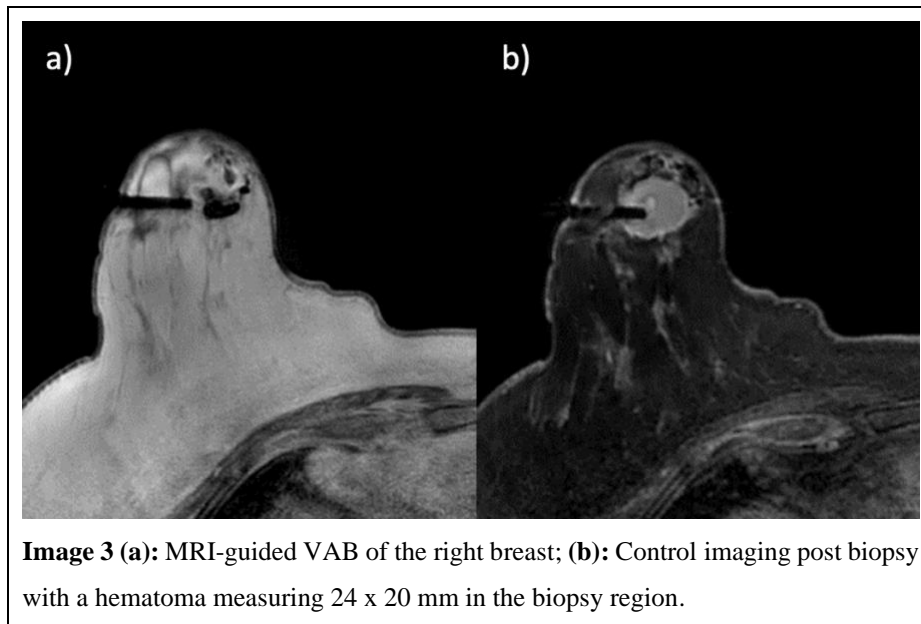


Image 2: Contrast enhanced T1w in subtraction technique, early dynamic phase, MIP-reconstruction.

MRI-guided vacuum assisted biopsy (VAB) of the lesion was performed after local anesthesia. Removal of 12 tissue cylinders (Suros Atec 9G/20 mm) with blood coagels without complications. A clip was inserted and the postinterventional T1w sequence already showed a hematoma measuring approximately 2 cm (Image 3b). The breast was subsequently compressed for a total of 30 minutes and a pressure dressing was applied. Histopathological analysis of the biopsy specimen resulted in capillary hemangioma (Image 5-7). We discussed the case in our postinterventional conference and since imaging was consistent with the histopathological report, we opted against performing a diagnostic excision.



Discussion

Hemangiomas are rare vascular tumors of the breast and are estimated to make up less than 1% of breast lesions [1]. Localized hemangiomas are further divided into the following subtypes: peri-lobular, parenchymal, subcutaneous and venous. The parenchymal subtype is classified into capillary and cavernous hemangiomas [2]. A high percentage of hemangiomas are diagnosed incidentally during imaging examinations. Because the sonographic features of hemangiomas are inconsistent, it can be difficult to diagnose them with confidence. Funamizu et al. performed an analysis of published case reports. They concluded that only three out of the 27 reported breast hemangiomas were diagnosed preoperatively [3]. Especially small lesions located superficially can be isoechoic to the surrounding breast parenchyma and adipose tissue, making diagnosis increasingly challenging [4,5].

Angiosarcomas of the breast are a rare but critical differential diagnosis to hemangiomas. Hemangiomas of the breast are generally considered benign lesions which, if any, have only a very low potential to become malignant [6]. Angiosarcoma on the other hand are an aggressive tumor entity, requiring radical surgical treatment [7,8].

Incidental vascular lesions of the breast require a clinical workup in order to rule out critical differential diagnoses. Therefore, in most cases, biopsy of these lesions appears warranted. If histopathologic and radiological findings are concordant, excision is not mandatory, according to current scientific knowledge [9-11]. This decision should be made in an interdisciplinary tumor conference [12], especially in the context of larger, non-homogenous lesions the representativeness of a biopsy should be discussed. In our case, since histopathological analysis resulted in a benign lesion without worrisome features, we opted against resection of the hemangioma and we decided to conduct, as recommended in the German guideline [13]. Especially within the context of a structured screening program, a close follow-up of lesions can be realized.

Our patient presented for follow-up imaging 6 months post intervention and the MRI showed that a complete removal of the hemangioma had occurred via the biopsy (Image 4).

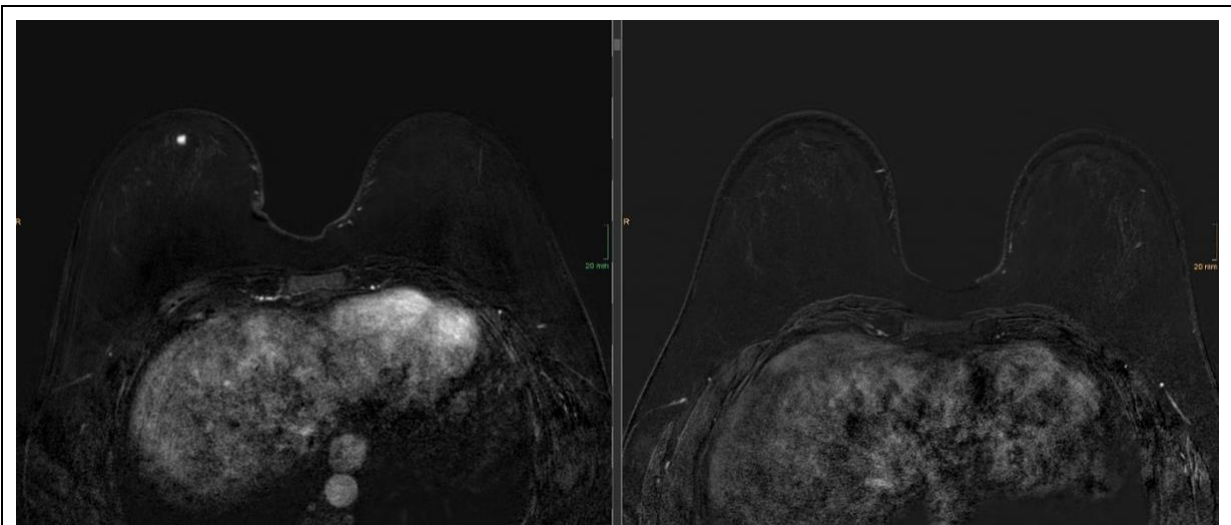


Image 4: Side-by-side of initial imaging with follow-up imaging 6 months post biopsy.

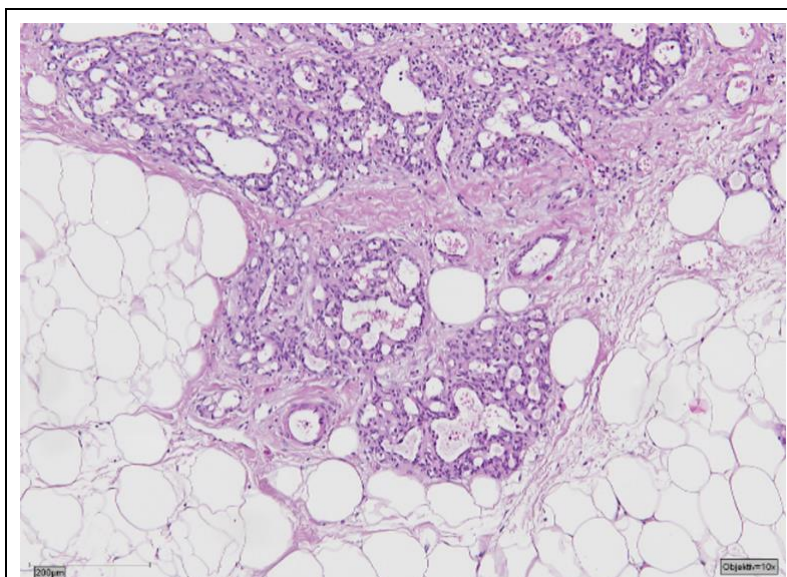


Image 5: Nodular, tumor-like capillary vascular proliferation without nuclear atypia or increased mitoses (HE).

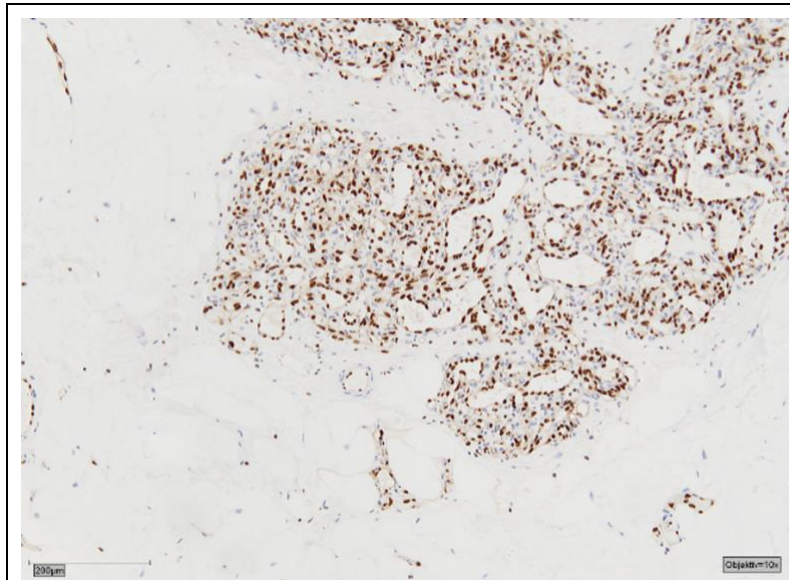


Image 6: Immunohistochemistry shows nuclear positivity with endothelial cell marker ERG.

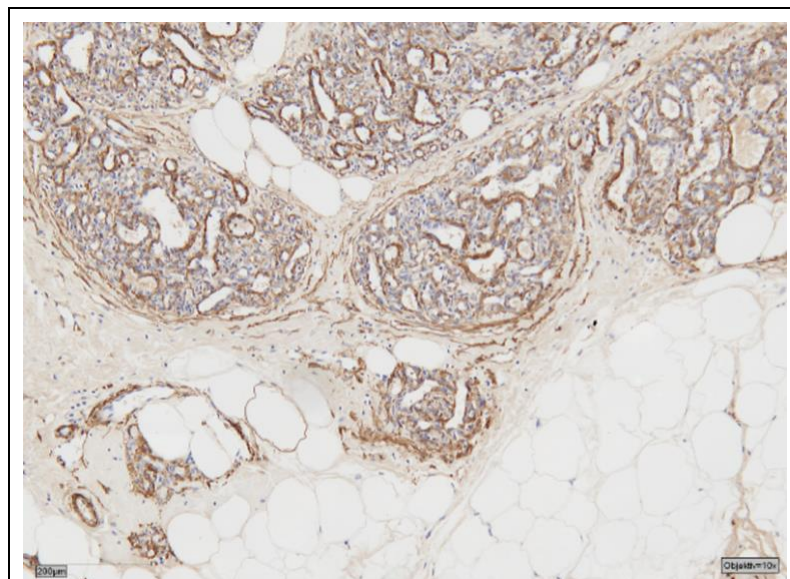


Image 7: Immunohistochemistry shows labelling with smooth muscle marker SMA.

Conclusion

Vascular tumors of the breast are rare tumor entities with diverse features on imaging and therefore confront clinicians with diagnostic challenges. Because diagnosis can often not be made with certainty via imaging alone, biopsy or excision may be necessary to allow delineation of critical differential diagnoses such as angiosarcoma and breast cancer. In cases with concordant imaging and biopsy results, diagnostic excision of the lesion may not be required. This decision should be made in an interdisciplinary conference.

REFERENCES

1. Smythe FW. Intramammary Hemangioma. *Annals of Surgery*. 1942; 115: 716-719.
2. Rosen PP, Jozefczyk MA, Boram LH. Vascular tumors of the breast: IV. The venous hemangioma. *The American Journal of Surgical Pathology*. 1985; 9: 659-665.
3. Funamizu N. Breast hemangioma with difficulty in preoperative diagnosis: a case report. *World Journal of Surgical Oncology*. 2014; 12: 313.
4. Glazebrook KN, Morton MJ, Reynolds C. Vascular Tumors of the Breast: Mammographic, Sonographic, and MRI Appearances. *American Journal of Roentgenology*. 2005; 184: 331-338.
5. Mesurolle B. Sonographic and Mammographic Appearances of Breast Hemangioma. *American Journal of Roentgenology*. 2008; 191: 17-22.
6. Nathenson MJ, Molavi D, Aboulafia A. Angiosarcoma Arising in a Patient with a 10-Year-Old Hemangioma. *Case Reports in Oncological Medicine*. 2014; e185323.
7. Brodie C, Provenzano E. Vascular proliferations of the breast. *Histopathology*. 2008; 52: 30-44.
8. Zhang H, Turner BM, Katerji H, et al. Vascular lesions of the breast: Essential pathologic features and diagnostic pitfalls. *Human Pathology Reports*. 2021; 26: 300570.
9. Board WC. WHO Classification of Breast Tumours: WHO Classification of Tumours. World Health Organization. 2019; Volume 2.
10. Mantilla JG. Core Biopsy of Vascular Neoplasms of the Breast: Pathologic Features, Imaging, and Clinical Findings. *Am J Surg Pathol*. 2016; 40: 1424-1434.
11. Sebastiano C. Benign Vascular Lesions of the Breast Diagnosed by Core Needle Biopsy Do Not Require Excision. *Histopathology*. 2017; 71: 795-804.
12. AGO Guidelines Breast Version 2022. 1E Lesions uncertain malignant potential.
13. Interdisziplinäre S3-Leitlinie für die Früherkennung, Diagnostik, Therapie und Nachsorge des Mammakarzinoms Langversion 4.3 – Februar 2020 AWMF-Registernummer: 032-045OL.