

Nodular Pseudoangiomatous Stromal Hyperplasia of Breast (PASH): An Unfamiliar Lesion May be Confused with Tumor

Zühal GÜCİN¹, Fatma Ümit MALYA², Merve Büşra CENGİZ², Şeyma YILDIZ³

¹Department of Medical Pathology, Bezmalem Vakif University School of Medicine, İstanbul, Turkey

²Department of General Surgery, Bezmalem Vakif University School of Medicine, İstanbul, Turkey

³Department of Radiology, Bezmalem Vakif University School of Medicine, İstanbul, Turkey

ABSTRACT

Pseudoangiomatous stromal hyperplasia (PASH) is a benign lesion of breast composed of proliferated stromal myofibroblastic cells. It is named due to presence of slit-like spaces without endothelial layer mimicking vascular structures. Most of the lesions detected incidentally in breast tissues resected with other causes. Occasionally it may presented as palpable or radiologically detectable mass. It may confused with malignancy or phylloides tumor in clinically or radiologically if it grows rapidly. Differential diagnosis includes angiosarcomas and other sarcomas on histopathological examination. In this report a PASH lesion presented with differential diagnostic criteria, detected in a 34 year of woman with a breast mass growing markedly in 6 months duration.

Keywords: Breast, benign breast lesions, pseudoangiomatous stromal hyperplasia

Introduction

Pseudoangiomatous stromal hyperplasia (PASH) is a benign lesion that occurs due to the proliferation of stromal myofibroblastic cells of the breast. It is characterized by the presence of “slit-like” spaces that resemble vascular structures, but does not include an endothelial layer (1). Hormonal imbalances are considered responsible for its occurrence (1), and its genetic background remains unknown (1).

Most cases are incidentally detected as small foci in breast tissues are excised for other reasons. PASH rarely presents as a mass that can be palpated or radiologically revealed (1-4). This condition is called nodular or tumoriform PASH. In some cases, it may display rapid growth or bilateral location (2, 5). PASH can be observed along the line extending from the axilla to the vulva in the structures of accessory breast tissues (1, 6).

On radiological imaging, PASH is seen as a massive lesion without calcification. On ultrasonography, it is seen as a well-demarcated, hypoechogenic mass with a posterior acoustic shadowing, and on magnetic resonance imaging, it is seen as an area with unclear margin and contrast enhancement (1, 2, 4).

Macroscopic evaluation of PASH reveals a well-demarcated, hard and elastic, yellow–white mass with a homogeneous lobulated structure (1, 2), with a size ranging from 1 to 12 cm.

Microscopic examination reveals ductal and lobular structures diverging from each other with the stroma displaying myofibroblastic proliferation and characteristic slit-like spaces anastomosing in the stroma. The formation of these pseudovascular structures has not exactly been understood yet. Tissue follow-up procedures have indicated that they occur in association with stromal retraction (2). PASH with myofibroblasts that are more

Cite this article as: Gücin Z, Malya FÜ, Cengiz MB, Yıldız Ş. Nodular Pseudoangiomatous Stromal Hyperplasia of Breast (PASH): An Unfamiliar Lesion May be Confused with Tumor. *Bezmalem Science* 2017; 189-92.

Address for Correspondence: Zuhall Gücin; Tıbbi Patoloji Anabilim Dalı, Bezmalem Vakıf Üniversitesi Tıp Fakültesi, İstanbul, Türkiye E-mail: zgucin@bezmalem.edu.tr

Received : 28.07.2016
Accepted : 24.10.2016

©Copyright 2017 by Bezmalem Vakif University - Available online at www.bezmalem-science.org

intense as bundles are called fascicular PASH (1). Atypia, hyperchromasia, mitosis, and necrosis are not generally observed (1). In the presence of atypia or hyperchromasia, PASH should be carefully examined for true sarcoma development.

Immunohistochemical analysis shows that myofibroblastic stromal cells express vimentin and CD34, but not CD31 and F8. Actin, desmin, and calponin are also detected (1, 2).

Differential diagnosis: Generally, fibroadenomas (1, 2) and phyllodes tumors are included in the differential diagnosis in elderly individuals and are clinically and radiologically evaluated (2). Rapidly growing tumors can be confused with malignancies (2, 3).

Histologically low-grade angiosarcoma can require differential diagnosis (2). Atypic endothelial cells and mitosis are characteristics of angiosarcoma; in their presence, PASH should be eliminated (2). Fascicular PASH cases need to be differentiated from myofibroblastomas (2).

Treatment and Prognosis: In cases that can be diagnosed with biopsy, follow-up is preferred. Some cases that have been followed up for 60 months without recurrence have been reported (6). Surgical excision is performed in cases that cannot be diagnosed with biopsy or is suspected to be malignant as well as in cases with space-occupying large lesions (3, 7). Recurrence is seen at a rate of 12%–26% (1, 2) and can develop in association with incomplete excision as residual breast stroma can contribute to the development of a new lesion because it is sensitive to the same hormonal stimulus (1).

Case Presentation

A 34-year-old female was admitted to the outpatient clinic due to a mass developing in the lower quadrant of her right breast and displaying apparent growth in 6 months. Mammographic examination revealed a 10×4 cm² well-demarcated mass with possible malignancy and heterogeneous internal echo nearly filling the lower quadrant (Figure 1). During anamnesis, it was learned that she had renal failure and used Vasoxen 5 mg/day for hypertension. The excised mass was $10 \times 8 \times 6$ cm³ in size; it was solid, included cystic structures, and had a fine encapsulated appearance, an elastic nodular structure, and a yellow–pink bright surface of section (Figure 2). On microscopic examination, thin and long spaces resembling those of vascular structures, fusiform cells resembling endothelial cells near some of these spaces, and similar cell bundles partly intensifying in the stroma were observed. Epithelial regions contained simple adenosis areas and microcysts (Figure 3). Although true lining endothelial cells were not found in the “slit-like” spaces on immunohistochemical examination, these cells displayed CD34 and smooth muscle actin positivity (Figure 4).

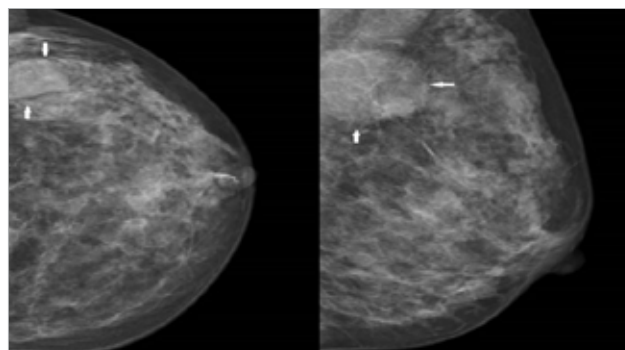


Figure 1. In MLO and CC mammography, a 44×22 mm² lesion with smooth margin and equal density to the breast parenchyma in the upper outer quadrant of the left breast (arrow).



Figure 2. A well-demarcated nodular formation. Its surface of section is pink–white and includes multiple cystic structures that are elastic and small.

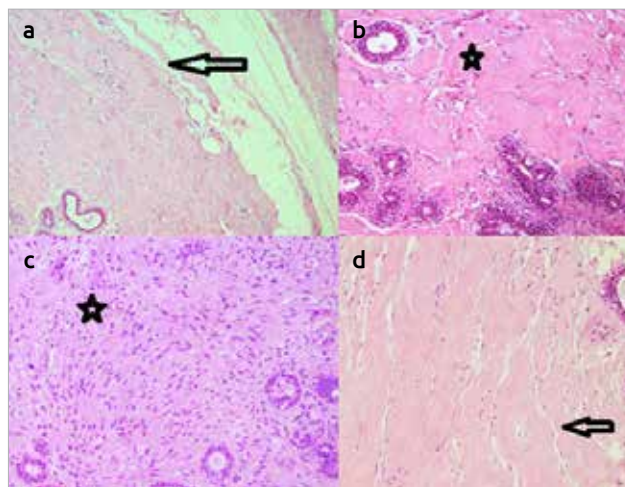


Figure 3. a-d. Well-demarcated and expansively growing lesion margins (arrow) (a); epithelial structures diverging from each other with proliferated stroma (*) (b); fascicular areas formed by intensifying myofibroblastic cells (*) (c); thin and long “slit-like” spaces in the stroma between the lobules (arrow) (d).

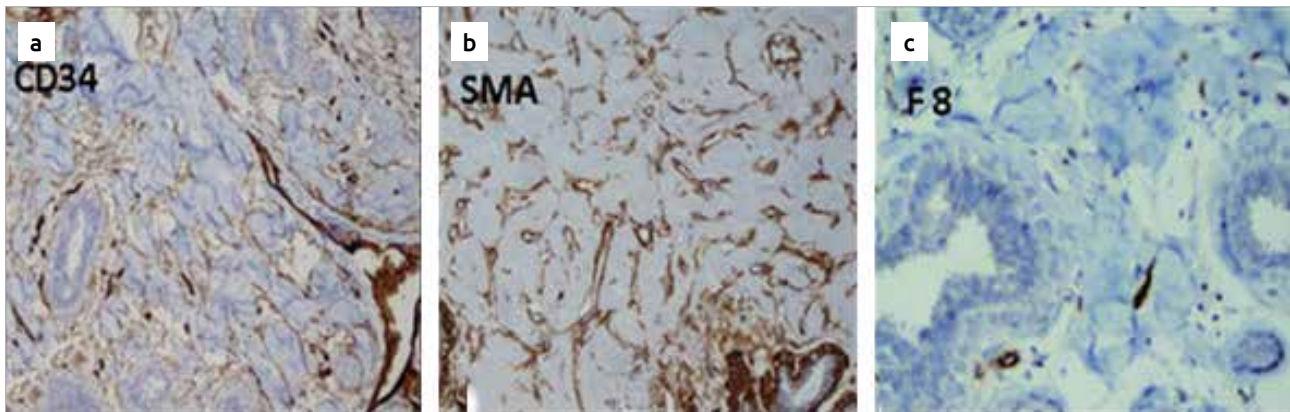


Figure 4. a-c. On immunohistochemical evaluation, CD34 (+) positivity in myoepithelial cells around the vein-like slit-like spaces (a); smooth muscle actin positivity in the same cells (b); F8 negativity/absence of endothelial cells in these structures, which are not a true vein (c)

Discussion

It is difficult to determine the accurate prevalence of PASH lesions as most are incidentally detected. In fact, many of those accompanying other benign lesions are overlooked.

Although PASH is typically encountered in premenopausal women, it can also be seen in postmenopausal women and children (1, 4). The mean age of patients with PASH is 37 years (1). Furthermore, incidentally detected cases have been reported in male patients, particularly during biopsies performed due to gynecomastia (2). In a series of 24 cases, only 2 of the cases were reported to be male patients (6).

Hormonal imbalance is considered to be responsible for its development (1). Its occurrence in premenopausal and peripubertal periods and in postmenopausal women receiving hormone replacement therapy with the use of oral contraceptives and its development with gynecomastia in male breasts support this claim. In all these cases, PASH is considered to develop due to the aberrant response of myofibroblasts to endogenous or exogenous hormones (1).

PASH can occur alone or it can be incidentally found in other proliferative or non-proliferative breast lesions (2). It has an incidence of 23% in the presence of fibrocystic changes (1).

Our patient is of a young age group, which is consistent with the literature. The mass rapidly grew in 6 months and nearly filled the lower quadrant and was excised because of the possibility of clinically and radiologically suspected malignancy. Histological findings were found to be consistent with those of nodular/tumoriform PASH.

In conclusion, PASH seems to be a lesion that is actually encountered more often in our daily practice, but does not draw our attention until it forms a mass. Diagnostic problems can occur when it is not considered as a change that terms the entire lesion and overlooked in core biopsies performed for

diagnosis of mass lesions or when it is confused with neoplasias, such as low-grade angiosarcoma and myofibroblastoma. Therefore, we suggest that PASH should be kept in mind in the diagnosis of mass lesions.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - Z.G., F.Ü.M., M.B.C., Ş.Y.; Design - Z.G.; Supervision - Z.G.; Resources - Z.G.; Data Collection and/or Processing - Z.G., F.Ü.M., M.B.C., Ş.Y.; Analysis and/or Interpretation - Z.G.; Literature Search - Z.G.; Writing Manuscript - Z.G.; Critical Review - Z.G.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

References

1. WHO Classification of Tumours of the Breast. 4th Ed. Lakhani SR, Ellis IO, Schnitt SS, Tan PH, van de Vijver MJ (eds). IARC, Lyon, 2012: 129-130.
2. AbdullGaffar B. Pseudoangiomatous Stromal Hyperplasia of the Breast. Arch Pathol Lab Med 2009; 133: 1335-1338.
3. Masannat YA, Whitehead S, Ian Hawley I, Apthorp L, Shah EF. Pseudoangiomatous Stromal Hyperplasia: A Case Report. Case Rep Med 2010; 2010: 549643. [\[CrossRef\]](#)
4. Jones KN, Glazebrook KN, Reynolds C. Pseudoangiomatous Stromal Hyperplasia: Imaging Findings With Pathologic and Clinical Correlation. AJR 2010; 195: 1036-1042. [\[CrossRef\]](#)
5. Bourke AG, Tiang S, Harvey N, McClure R. Pseudoangiomatous stromal hyperplasia causing massive breast enlargement. BMJ Case Rep 2015; doi:10.1136/bcr-2014-204343. [\[CrossRef\]](#)
6. Bowman E, Oprea G, Okoli J, Gundry K, Rizzo M, Gabram-Mendola S, Upender Manne U, Smith G, Pambuccian S, Bumpers HL. Pseudoangiomatous Stromal Hyperplasia (PASH) of the Breast: A Series of 24 Patients. Breast J 2012; 18: 242-247. [\[CrossRef\]](#)

7. Jung BK, Nahm JH, Lew DH, Lee DW. Treatment of Pseudo-angiomaticous Stromal Hyperplasia of the Breast: Implant-Based Reconstruction with a Vascularized Dermal Sling. Arch Plast Surg 2015; 42: 630-34. [\[CrossRef\]](#)