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Case Report

Pathology Section

Pseudoangiomatous Stromal Hyperplasia of the Breast Diagnosed on Excisional Biopsy: A Case Report

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ABSTRACT

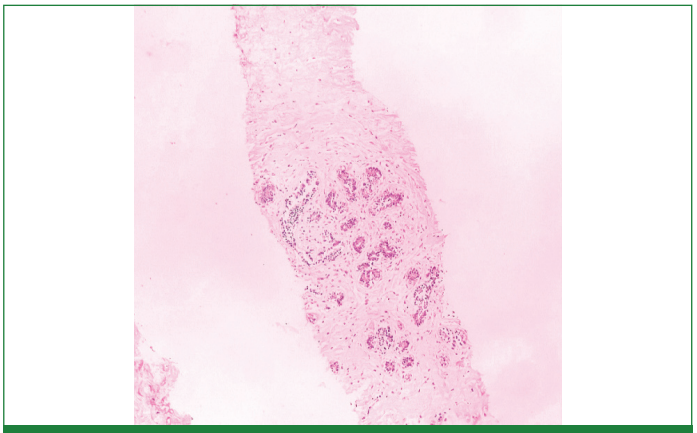
Pseudoangiomatous Stromal Hyperplasia (PASH) is a rare benign mesenchymal lesion of the breast. When PASH presents as a mass lesion, it is referred to as a PASH tumour, which is an uncommon manifestation. In the present case report, the authors describe a 34-year-old woman who presented with a painful lump in the left breast. Mammography revealed a well-defined dense lesion {BI-RADS IVa (Breast Imaging-Reporting and Data System Category 4a: Low Suspicion for Malignancy)} in the left breast, raising clinical and radiological suspicion of malignancy. A True-Cut (Tru-cut) biopsy was performed, and microscopic examination showed linear cores of breast parenchyma with a few terminal duct-lobular units. Malignancy was excluded using Immunohistochemistry (IHC), following which wide local excision was undertaken. The excised lesion was diagnosed as PASH. Histopathological examination showed a circumscribed lesion composed of terminal duct-lobular units with ducts and acini lined by inner luminal and outer myoepithelial cells. The stroma demonstrated anastomosing slit-like spaces lined by spindle to oval-shaped cells with bland nuclei, embedded within dense collagen. The spaces were empty. IHC revealed Cluster of Differentiation 34 (CD34) positivity in the spindle cells and Cluster of Differentiation 31 (CD31) negativity, helping to differentiate PASH from vasoformative lesions. The treatment of choice is complete surgical excision, as recurrence may occur following incomplete resection. There is no evidence of malignant transformation in PASH; therefore, accurate diagnosis is important to avoid overtreatment. PASH may occur in association with other breast lesions such as fibroadenoma, sclerosing lobular hyperplasia, and gynaecomastia; hence, careful evaluation for associated lesions with malignant potential is necessary. The present case is reported due to its rare presentation as a PASH tumour.

Keywords: Benign mesenchymal lesion, Myofibroblasts, Stromal proliferation

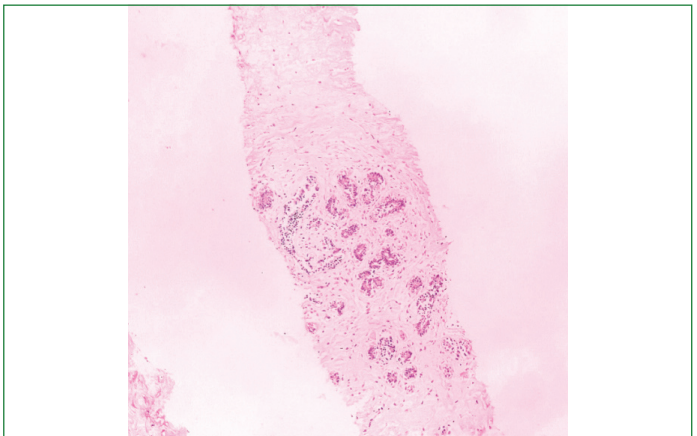
CASE REPORT

A 34-year-old woman presented with a rapidly enlarging painful lump in the left breast for six months. There was no history of similar illness in the past. On clinical examination, the lump was firm to hard, mobile, and measured 12×10×4 cm, involving the upper outer quadrant and nipple-areolar region. Ultrasonography of the left breast showed a well-defined hypoechoic lesion in zone I of the mammary region at the 12 o'clock position. Mammography revealed a well-defined dense lesion in the upper outer quadrant, crossing the midline and extending into the retromammary region, measuring 11×7×3.5 cm. The lesion was categorised as BI-RADS IVa. The right breast was normal on imaging. A Tru-cut biopsy was performed. Grossly, five linear cores of grey-white soft tissue were received, ranging from 0.5 to 2 cm in length. Microscopic examination showed linear cores of breast parenchyma with a few terminal duct-lobular units, with ducts demonstrating mild epithelial hyperplasia [Table/Fig-1,2]. The intervening stroma was hyalinised.

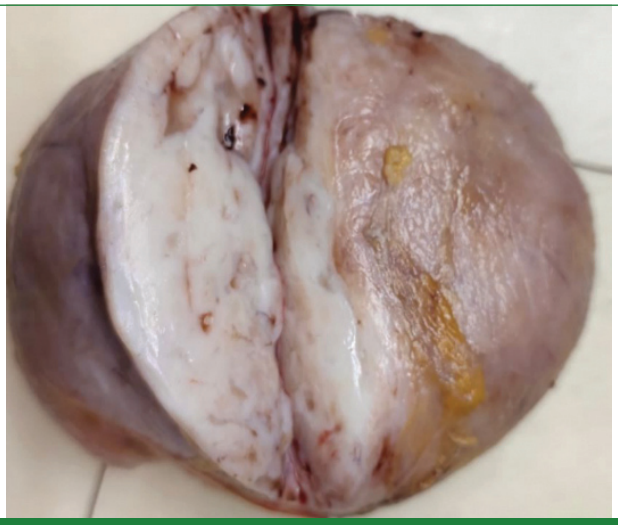
IHC for oestrogen receptor and Tumor Protein 63 (p63) was performed. Oestrogen receptor positivity was seen in ductal epithelial cells, and p63 highlighted the myoepithelial cells, thereby excluding malignancy. Subsequently, a lumpectomy specimen measuring 13×9×4.8 cm was received. The external surface was well demarcated, encapsulated, and smooth. On cut section, the lesion was grey-white, firm, and homogeneous, with tiny cystic spaces measuring 0.1-0.5 cm. No areas of haemorrhage or necrosis were identified [Table/Fig-3,4]. Microscopic examination revealed a circumscribed lesion composed of terminal duct-lobular units with ducts and acini lined by luminal and myoepithelial cells. The stroma contained interanastomosing slit-like spaces lined by spindle to oval-shaped cells with bland nuclei, surrounded by dense collagen [Table/Fig-5,6]. The spaces were empty [Table/Fig-7], and congested blood vessels were also noted.



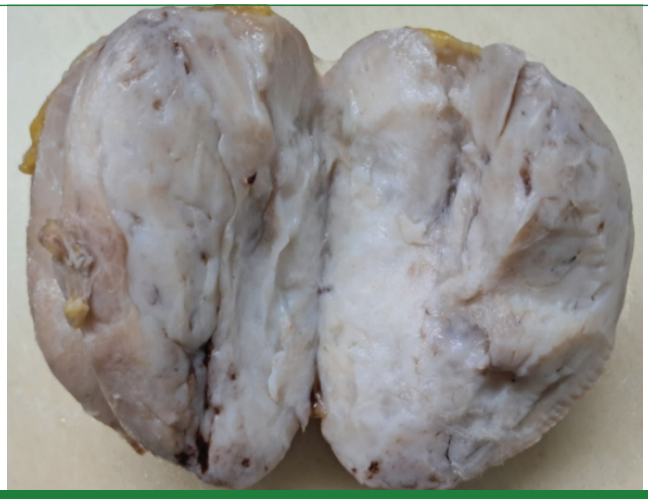
[Table/Fig-1]: Microscopy of tru-cut biopsy showing linear core breast parenchyma exhibiting mild epitheliosis in a fibro collagenous background (100x magnification).



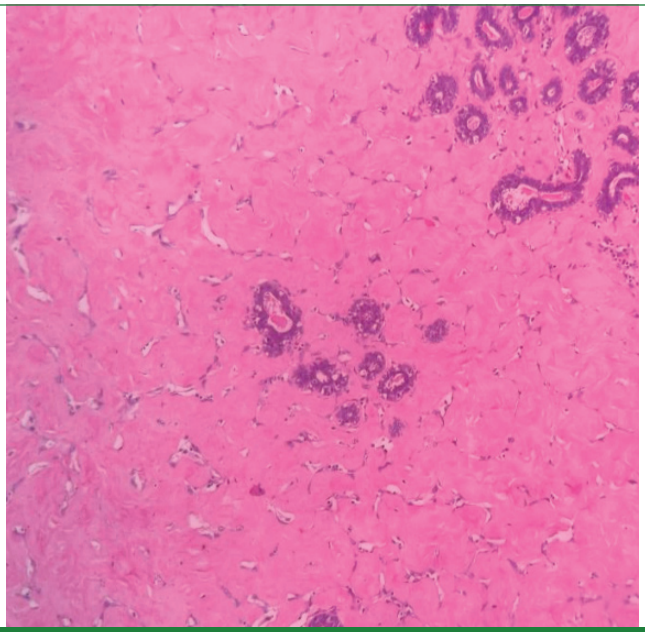
[Table/Fig-2]: Microscopy of tru-cut biopsy showing linear core breast parenchyma exhibiting mild epitheliosis in a fibro collagenous background. (100x magnification).



[Table/Fig-3]: Gross image showing well demarcated smooth mass externally and cut surface showing cystic spaces.



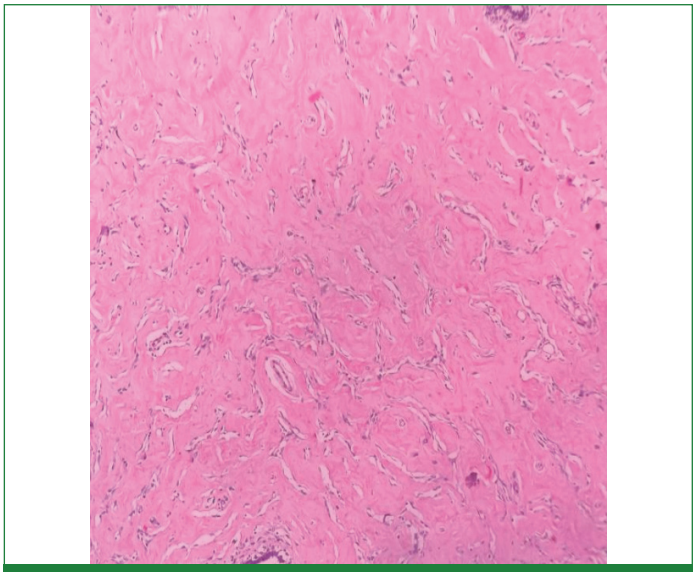
[Table/Fig-4]: Gross image of cut surface showing cystic spaces.



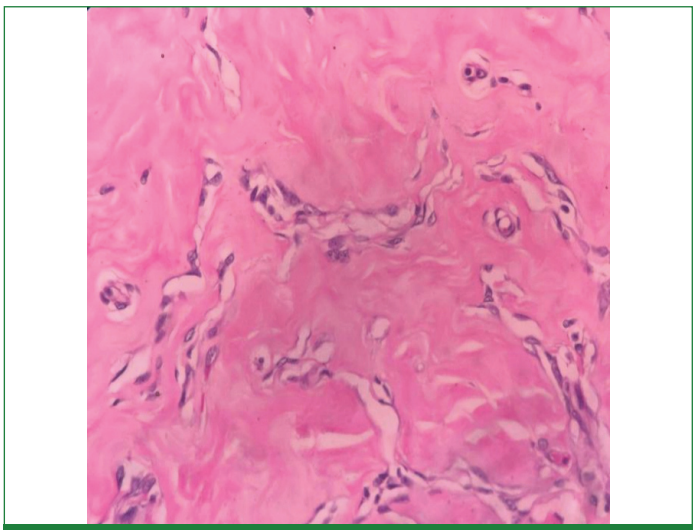
[Table/Fig-5]: Microscopy of lumpectomy specimen showing large inter anastomosing empty spaces lined by spindle to oval shaped benign cells in a dense collagenous stroma. Also, seen a focus of mild epitheliosis (100x magnification).

To differentiate PASH from vascular proliferations, IHC was performed. The spindle cells lining the spaces showed positivity for CD34 [Table/Fig-8] and were negative for CD31 [Table/Fig-9], confirming the diagnosis of pseudoangiomatous stromal hyperplasia.

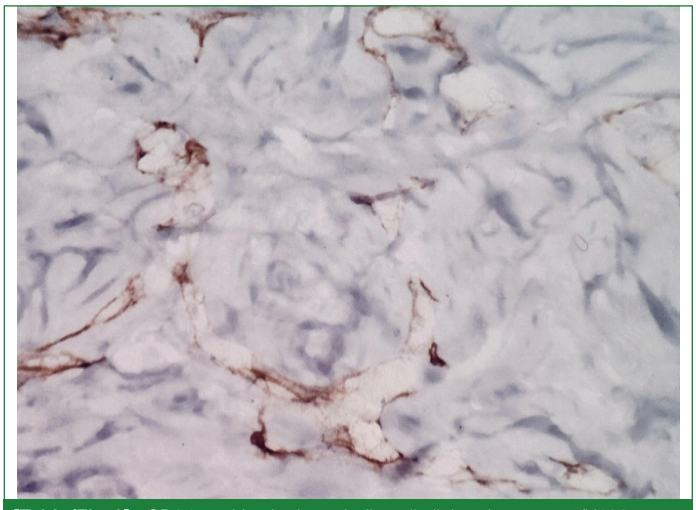
The patient underwent complete excision of the lesion, and no recurrence has been reported to date.



[Table/Fig-6]: Microscopy of lumpectomy specimen showing large inter anastomosing empty spaces lined by spindle to oval shaped benign cells in a dense collagenous stroma.



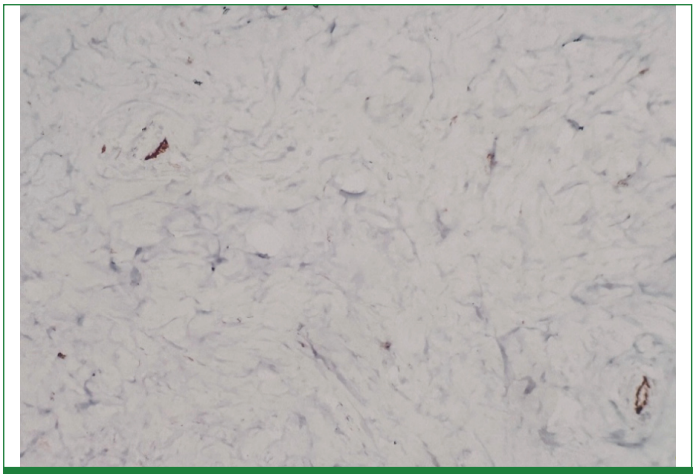
[Table/Fig-7]: Microscopy showing high power view of the spaces without any red blood cells in a dense collagenous stroma. (X400 magnification).



[Table/Fig-8]: CD34 positive in the spindle cells lining the spaces (X400 magnification).

DISCUSSION

The PASH is a rare benign stromal proliferation characterised by the formation of slit-like spaces within dense collagenous stroma. It is most commonly an incidental finding on histopathological examination [1]. This stromal proliferation is believed to occur in response to hormonal stimuli [2]. PASH presenting as a mass lesion is a rare clinical scenario and is infrequently reported in the literature [3].



[Table/Fig-9]: CD31 negative in the spindle cells lining the spaces, whereas positive in the endothelial cells of the blood vessels. (100x magnification).

The most striking histological feature is a complex pattern of large anastomosing slit-like spaces lined by spindle-shaped cells without cytological atypia within dense collagenous stroma. Non-specific changes may include ductal and lobular hyperplasia. The myofibroblasts distributed singly and discontinuously along the margins of these spaces resemble endothelial cells; therefore, differentiation from low-grade angiosarcoma is essential [12].

Low-grade angiosarcoma contains interanastomosing vascular channels filled with red blood cells and lined by atypical endothelial cells. Additionally, the fascicular variant of PASH, a cellular form in which myofibroblasts are arranged in fascicles, must be distinguished from myofibroblastoma [13-15]. Selected cases from the literature have been tabulated and compared [Table/Fig-10] [1,3,5,6,8,10,12-14].

Myofibroblastoma typically shows absence of breast epithelial elements. Immunohistochemically, spindle cells in PASH are positive for CD34, vimentin, oestrogen receptor, progesterone receptor, desmin, and actin, while negative for CD31, factor VIII, and keratin. Importantly, there is no evidence of malignant transformation in PASH, making accurate diagnosis essential [14,15]. PASH may occur in association with lesions such as fibroadenoma, sclerosing lobular hyperplasia, and gynaecomastia; therefore, careful evaluation for coexisting lesions with malignant potential is necessary [15]. The recommended treatment for PASH is complete surgical excision of the mass [16].

Study	Year	No. of cases	Age and gender	Clinical findings	Imaging	Histopathology associated findings	Treatment
Yigit B et al., [1]	2020	1	15 years female	Breast pain and lump	---	Pseudoangiomatous stromal hyperplaisia	Excision
Vashistha A et al., [3]	2020	1	38 years female	Bilateral breast lump	No specific findings	Pseudoangiomatous stromal hyperplaisia	Excision
Surace A et al., [5]	2020	1	30 years female	Breast mass	Suspicious of malignancy	Pseudoangiomatous stromal hyperplaisia	Lumpectomy
Lian Z et al., [6]	2024	1	53 years female	Bilateral breast pain and enlagement	Breast enlargement without calcifications	Pseudoangiomatous stromal hyperplaisia, IHC-CD34 positive, CD31-negative	Excision
Woo SH et al., [8]	2023	1	14 years female	Bilateral breast enlargement	No significant abnormality	Pseuodangiomatous stromal hyperplasia	Breast reduction surgery
Parameswaran R et al., [10]	2022	8	Fourth and fifth decade, females	Breast enlargement	Equal density lesion with obscured margins and occasional coarse calcification	Pseudoangiomatous stromal hyperplasia with associated fibroadenoma.	Excision
Tahmasebi S et al., [12]	2022	6	12 years to 51 years, female	Breast enlargement	Non specific	Pseudoangiomatous stromal hyperplasia	Excision
Sakibuzzaman M et al., [13]	2021	1	39 female	Breast lump	Not significant	Pseudoangiomatous stromal hyperplasia	Excision
Yu M et al., [14]	2024	1	23, female	Bilateral Breast lump	Hypoechoic, well-defined lesions	Pseudoagiomatous stromal hyperplasia	Resection

[Table/Fig-10]: Comparison of present case with published cases [1,3,5,6,8,10,12-14].

PASH is derived from myofibroblasts that are immunoreactive for CD34. These myofibroblasts exhibit increased secretory activity, resulting in collagen production and subsequent stromal hyperplasia [4]. Thus, PASH represents a benign mesenchymal myofibroblastic proliferation in response to hormonal influences [5,6]. The term pseudoangiomatous refers to the histological pattern that mimics a vasoformative proliferation. However, these slit-like spaces usually do not contain red blood cells and, unlike true vascular spaces, are not lined by endothelial cells [7].

PASH occurs most commonly in premenopausal women between 37 and 51 years of age and in cases of gynaecomastia [7]. It may also rarely occur in young girls and postmenopausal women receiving hormonal therapy [8]. In most instances, PASH is an incidental histopathological finding, whereas tumour-forming PASH is a rare presentation [9]. Clinically, patients typically present with a palpable, painless, rubbery, firm mass occurring in any quadrant of the breast. On mammography, lesions usually appear as well-defined masses without calcification, focal asymmetrical densities, and smooth borders [10].

On core needle biopsy, PASH may be misinterpreted as a phyllodes tumour due to prominent stromal proliferation, or it may be overlooked when associated with other lesions such as fibroadenoma, from which the biopsy sample may have been taken. Grossly, the mass is well circumscribed and smooth, often resembling a capsule. The size may range from 1 to 15 cm. The cut surface is homogeneous, grey-tan to white, and may occasionally show cystic areas [11].

CONCLUSION(S)

Pseudoangiomatous stromal hyperplasia presenting as a mass lesion is a rare clinical entity. Definitive diagnosis requires histopathological evaluation, as clinical and radiological features are nonspecific and may mimic malignancy. Wide local excision is the treatment of choice, and recurrence is usually associated with incomplete excision.

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