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Case Report

Pseudoangiomatous Stromal Hyperplasia in an Unmarried Female with Asymmetric Breasts

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ABSTRACT

Pseudoangiomatous stromal hyperplasia (PASH) is a non-cancerous mesenchymal growth in the breast. It was first described by Vuitch, et al. in 1986 wherein it appeared as a palpable breast lump in a patient. Only around 109 cases had been documented by 2008. The etiology and pathogenesis of PASH are still unknown; however, there is some evidence suggesting PASH is hormone dependent. Herewith we present a case of 29 years old unmarried lady who presented to plastic surgery department of our hospital with complaint of painless, asymmetric breasts. Her mammography showed global dense asymmetrical breast parenchyma more in left breast compared to her right breast. Her PASH diagnosis was confirmed on gold standard test of histopathology.

Keywords: Pseudoangiomatous stromal hyperplasia, Breast

INTRODUCTION

Pseudoangiomatous stromal hyperplasia (PASH) is a benign proliferation of myofibroblasts, first described by Vuitch, et al. in 1986.[1] The term "pseudoangiomatous" was introduced to highlight that, although the histological appearance resembles a vascular proliferation, it does not represent the true blood vessel formation.

PASH is commonly identified as a microscopic lesion discovered incidentally, but it can occasionally present as a palpable mass mistaken for neoplastic condition, or, in rare cases, as a large mass causing painless breast asymmetry.[2-4] Its clinical and radiological features frequently mimic those of fibroadenoma, phyllodes tumor, or hamartoma, leading to potential misdiagnosis.[5,6]

PASH is commonly found in premenopausal women. It is less frequently seen in males with gynecomastia or post-menopausal women undergoing hormone therapy. Owing to this, it is thought to be a hormone-dependent condition.[7] Here, we present a case report of 29 years old unmarried female presented to plastic surgery department of our hospital with complaint of painless, asymmetric breasts. On bilateral breasts' mammography, heterogenous dense fibroglandular breast parenchyma was noted. But on histopathological report, it evidently showed features of PASH.

CASE HISTORY

A 29 years old female presented to plastic surgery department of our hospital with complaint of firm, vague, painless asymmetrical breasts. She did not complain of nipple discharge or overlying skin discoloration. She never had fever. Her vitals and routine blood tests were stable. She did not have any family history of breast cancer.

Mammography of the bilateral breasts showed heterogenous dense fibroglandular breast parenchyma noted without evidence of dilated ducts or focal mass or local collection. The lesion was more prominent on her left breast compared to her right breast leading to clinical asymmetry. As mass cause aesthetic discomfort to the patient before her impending marriage, the plastic surgeon planned for

reduction mammoplasty of over left breast lesion. Specimen was subsequently sent for histopathology.

On gross examination, the resected left breast tissue specimen revealed grey white to grey brown, soft to firm, fibrofatty mass with intact skin. It totally measured 20 x 13.5 x 3 cm with unremarkable, covering skin measuring 12.5 x 8 cm (Figure-1). Cut section showed grey white to tan colored, firm, homogenous tissue areas measuring 8 x 5 x 2.8cm (Figure-2). No evidence of tumor or necrosis. No evidence of cystic component in lesion. No evidence of pus.

Figure-1: Left breast lesion with intact skin. Tan colored extruded lesion seen from stromal tissue component

Figure-2: Serially transversely cut section of left breast lesion showing grey-white to tan colored, firm, homogenous tissue with intervening breast's fat

Microscopy: Large fibro-collagenous and myofibroblastic tissue was seen with entrapped breast adipose tissue. Stromal myofibroblastic proliferation formed clefts, simulating vascular lesional spaces with entrapped breast tissue (Figure-3). The stromal myofibroblastic proliferation in the form of clefts showed bland, flattened, elongated nuclei, simulating vascular endothelial cells (Figure-3). Normal terminal duct lobular unit noted with peri-lobular and intralobular fibrosis. Dense fibrosis with collagenous tissue and scanty breast adipose tissue noted.

Skin showed mild epidermal papillomatosis and epidermal thinning. Dermis shows unremarkable adnexa surrounded by dense fibro-collagenous and myofibroblastic tissue. Subcutis fat is unremarkable. (Figure-4). On histopathology this case was reported as Pseudoangiomatous Hyperplasia of mammary stroma.

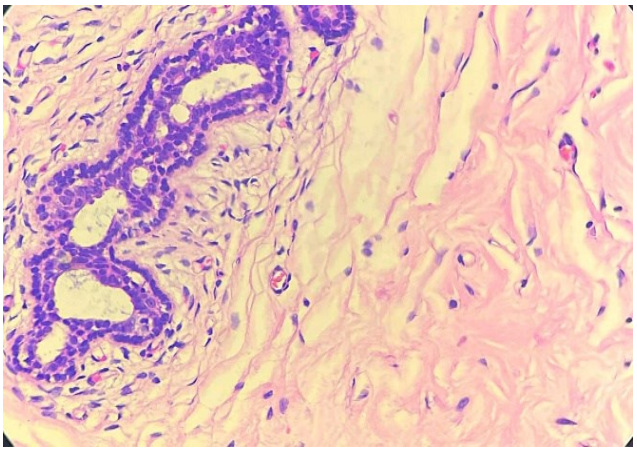

Figure 3: Microphotograph shows dense myofibroblastic stroma with slit-like spaces in pseudoangiomatous appearance (H & E, x 400)

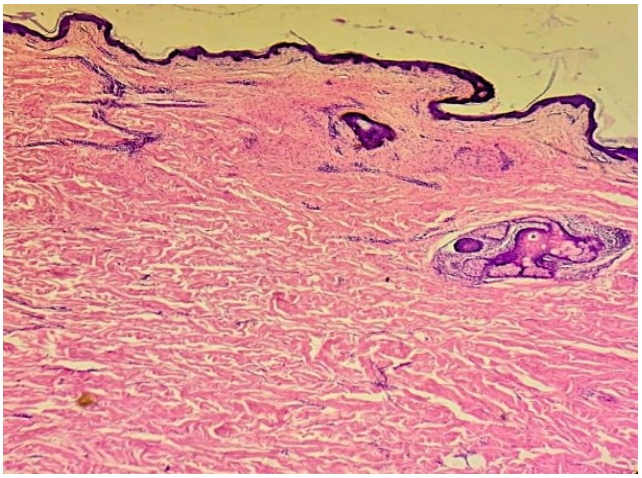

Figure-4: Micrograph shows mild epidermal papillomatosis, epidermal thinning, with dermal fibro-collagenous and myofibroblastic tissue (H & E, x 100)

DISCUSSION

Pseudoangiomatous stromal hyperplasia (PASH) in breast is a rare entity described by Vuitch, et al. in 1986. It is a

benign stromal myofibroblastic proliferation characterized by the formation of cleft-like spaces mimicking a vascular lesion.[1,2]

Term "pseudoangiomatous" refers to a histological pattern that mimic but does not represent the true angiomatous proliferation. This distinction is clinically significant, as it is essential to differentiate this benign lesion from vascular neoplasms, particularly low-grade angiosarcoma.[1,2,7] It predominantly affects women in the premenopausal and perimenopausal stages. This condition can also occur in men and, though less commonly, in children.[7,8] It is an inadvertent finding that can occur in both male and females. It can be associated with other benign and malignant conditions.[7,8]

A study by Celliers, et al. examined the mammographic and sonographic characteristics of 73 cases of pseudoangiomatous stromal hyperplasia (PASH). On mammography, the most frequent presentation was a solid, non-calcified mass or localized stromal density, while stromal distortion and stellate opacities were observed infrequently. On sonographic examination, PASH commonly appeared as a well-circumscribed, hypoechoic mass. These imaging features often led to an initial impression of fibroadenoma or another benign lesion.[9,10]

Magnetic resonance imaging (MRI) may reveal nonspecific findings, which can range from an enhancing mass to areas of clumped, non–mass-like enhancement. The study concluded that although certain imaging patterns may suggest PASH, the findings lack sufficient specificity to enable a definitive diagnosis based solely on imaging. Therefore, histopathological confirmation remains essential.[7-9]

Based on current literature, when pseudoangiomatous stromal hyperplasia (PASH) is diagnosed via core needle biopsy (CNB), surgical excision may be unnecessary. Instead, careful observation with serial mammographic follow-up to monitor for interval growth may be considered an appropriate management strategy.[3,6,11-15] In our case, biopsy was not done and based on mammography report, she was subjected to reduction mammoplasty. We diagnosed PASH on resected breast lesion.

According to studies available, the management of PASH is typically guided by the physician's clinical judgment. It includes core needle biopsy (CNB) findings, imaging characteristics, and overall clinical presentation. Treatment options include active surveillance, vacuum-assisted excision (VAE), or surgical excision (as in our case).[13]

Grossly, PASH lesions typically range in size from 0.6 cm to 12 cm, with the largest reported case measuring 20 cm in a 36-year-old woman. These lesions are generally well-circumscribed, round to oval fibrous masses, and may appear white, gray, or tan in color. The external surface is usually smooth and lacks a true capsule. On cut section, PASH presents as a homogenous, solid gray-white lesion, occasionally containing cystic spaces.[1,2,13,14]

Microscopically, PASH shows a wide spectrum of morphologic changes ranging from typical appearance to more proliferative lesions. It consists of microscopically as pseudoangiomatous stromal hyperplasia (PASH) exhibits a broad spectrum of morphological features, ranging from classic patterns to more proliferative forms. Characteristically, it is composed of a complex network of slit-like, anastomosing spaces lined by spindle-shaped myofibroblasts, mimicking vascular channels. These spaces are embedded within a collagenous stroma. Importantly, PASH may be misdiagnosed as low-grade angiosarcoma due to its pseudo-vascular appearance; however, unlike true vascular spaces in angiosarcoma - which exhibit infiltrative growth, papillary endothelial projections, and hyperchromatic endothelial cells - the channels in PASH represent stromal clefts formed by the separation of collagen fibers, without true endothelial lining or vascular invasion.[1,11]

The stromal proliferation in PASH may involve both peri-lobular and intralobular regions. Expansion of the intralobular stroma can lead to effacement of terminal duct–lobular units, although isolated involvement of the peri-lobular stroma is more commonly observed. The epithelial component is generally unremarkable, but may show areas of usual ductal hyperplasia and/or apocrine metaplasia. In some cases, myoepithelial cell hyperplasia is also present. Ducts may exhibit gynecomastia-like changes, including nuclear overlapping, hyperchromasia, prominent nucleoli, and hyperplasia of myoepithelial cells. Notably, such gynecomastia-like changes have been significantly associated with intralobular stromal involvement.[11]

The differential diagnosis of pseudoangiomatous stromal hyperplasia (PASH) includes low-grade angiosarcoma, myofibroblastoma, and fibromatosis. Immunohistochemical analysis plays a crucial role in distinguishing PASH from these entities. On immunohistochemical analysis, the spindle cells lining the characteristic slit-like spaces in pseudoangiomatous stromal hyperplasia (PASH) demonstrate positivity for myofibroblastic markers, including CD34, vimentin, and smooth muscle actin (SMA). These cells are consistently negative for cytokeratin, S100, and endothelial markers such as von Willebrand factor and CD31, supporting their non-vascular and non-epithelial origin. In areas with fascicular architecture, desmin expression may also be observed. The stromal cells typically exhibit nuclear positivity for progesterone receptor (PR), while estrogen receptor (ER) expression is often focal and weak. In contrast, the epithelial components frequently show strong nuclear positivity for both ER and PR.[1,2,13-15]

CONCLUSIONS

PASH most commonly affects premenopausal women and may present either as a palpable mass or as an incidental finding on imaging. Core needle biopsy is essential for diagnosis and must be interpreted in the context of clinical and radiologic findings. Surgical excision is recommended for lesions that are enlarging, symptomatic, or associated with suspicious imaging features. In the absence of such findings, active surveillance with clinical and radiologic follow-up is an appropriate management strategy. The prognosis of PASH is excellent, with a very low risk of recurrence. Shared decision-making that incorporates a thorough discussion of risks, benefits, and patient preferences is crucial for optimal care. Awareness of this diagnosis is important for both surgeons and pathologists which are managed conservatively and have significantly better prognoses than malignant conditions.

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