

Case Report

Diffuse Left Breast Enlargement and Microcalcifications Secondary to Large Nodular PASH

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Abstract

Pseudoangiomatous stromal hyperplasia (PASH) is a benign breast lesion of proliferating fibroblastic or myofibroblastic stromal elements in slit like clefts resembling vascular channels. It is usually seen as incidental microscopic changes at core needle biopsy of other mammographic findings. Clinical presentation can vary broadly, sometimes presenting as a focal mass on mammography, and rarely as a palpable breast lump. Knowledge of PASH facilitates interpretation of images and can be crucial to differentiating it from other pathological processes, particularly in cases where low-grade angiosarcoma may be of concern.

ABBREVIATIONS

PASH: Pseudoangiomatous Stromal Hyperplasia

INTRODUCTION

Pseudoangiomatous stromal hyperplasia (PASH) of the breast is a benign mesenchymal proliferative breast lesion. It most commonly occurs in menopausal women but has been seen in men with gynecomastia as well as in children [1-3]. Most cases of PASH present as incidental microscopic foci, but can also present clinically as a solitary palpable mass, multifocal nodule, or diffuse enlargement of the breast [4, 5]. There are no distinct radiologic characteristics that have been found for PASH lesions. Mammography generally shows a well-circumscribed, dense, homogenous, and usually noncalcified mass [6]. Sonography generally demonstrates a hypoechoic, solid mass with or without cystic spaces [6]. Due to the nonspecific nature of these findings, PASH is recognized as a mimicker of fibroadenoma, especially in younger woman [1,3,5, 6]. Rapidly expanding lesions can raise suspicion for malignancy, and in older-aged women, PASH can be confused with phyllodes tumor or hamartoma [3].

Because current imaging studies are not specific enough to make a definite diagnosis of PASH, a histologic examination is required [5-7]. Histologically, PASH consists of complex, anastomosing, slit-like spaces that are either acellular or composed of spindled cells. PASH can be confused with low-grade angiosarcoma histologically due to the presence of these slit like spaces, as they can resemble the endothelium-lined vascular channels seen in angiosarcoma [1, 6].

CASE PRESENTATION

A 37-year-old female immigrant presented with gradual,

painless, asymmetric left breast enlargement for 6 years. She had multiple prior biopsies and excisions in Iraq which reportedly demonstrated fibrocystic change. Per the patient, her left breast had become asymmetrical at her first pregnancy and had further increased in size with her 3 subsequent pregnancies. No isolated breast lumps were palpable on physical exam.

Mammography demonstrated asymmetric diffuse enlargement and increased density of the left breast with diffuse, round, and amorphous calcifications (Figure 1b). The right breast in comparison demonstrated no abnormalities (Figure 1a). An ultrasound of the left breast was obtained which revealed extensive heterogeneous breast parenchyma with both solid and fluid components and multiple associated punctate calcifications (Figure 2). Overall, the patient was given a BI-RADS 4 assessment, with tissue diagnosis recommended.

Pathology from the ultrasound-guided core needle biopsy revealed multiple portions of benign cyst wall and chronic inflammation with no malignancy identified. At this point in her care, the patient underwent breast surgical consultation, and a left partial mastectomy and mastopexy were performed. Post excisional pathology revealed marked fibrocystic change, sclerosing adenosis with microcalcifications, pseudoangiomatous stromal hyperplasia, and the absence of malignancy or atypia. Of note, the extent of PASH measured 15 cm. The patient did well post operatively with excellent cosmetic results. A 6-month follow-up mammogram demonstrated no significant masses, calcifications or other abnormalities (Figure 3).

DISCUSSION

Microscopic PASH is a relatively common diagnosis on routine breast biopsy and excisional specimens. In fact, small foci

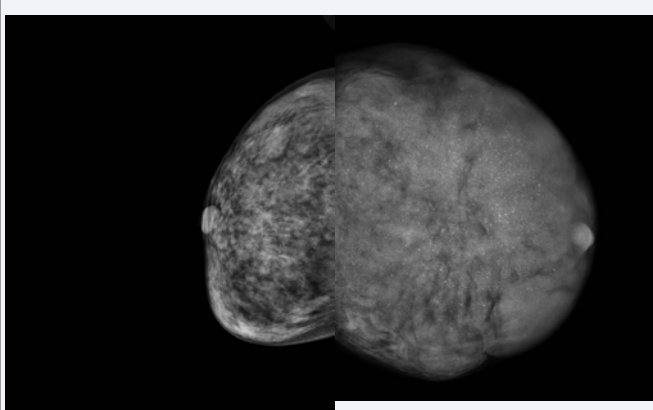


Figure 1 Striking difference between breast sizes in a 37-year-old woman presenting with gradual left breast enlargement over 6 years. (a) Craniocaudal (CC) view of the right breast shows heterogeneously dense fibroglandular tissue with no suspicious abnormalities while (b) CC view of the left breast demonstrates increased density and contains innumerable diffuse round and amorphous calcifications.

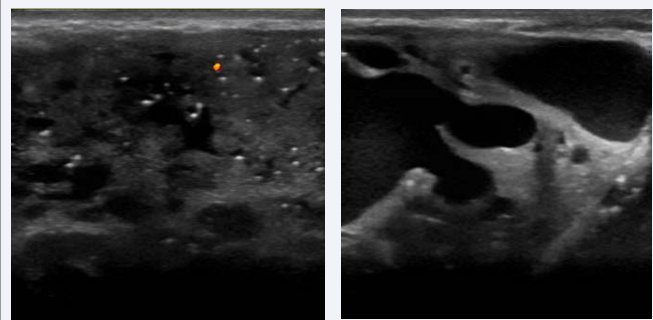


Figure 2 Ultrasound examination of the left breast in a 37-year-old woman presenting with gradual left breast enlargement over 6 years. (a) Ultrasound demonstrates extensive heterogeneous tissue and diffuse calcifications and (b) multiple, large, cystic spaces. No significant vascularity is seen on either image, both of which were performed with color Doppler.

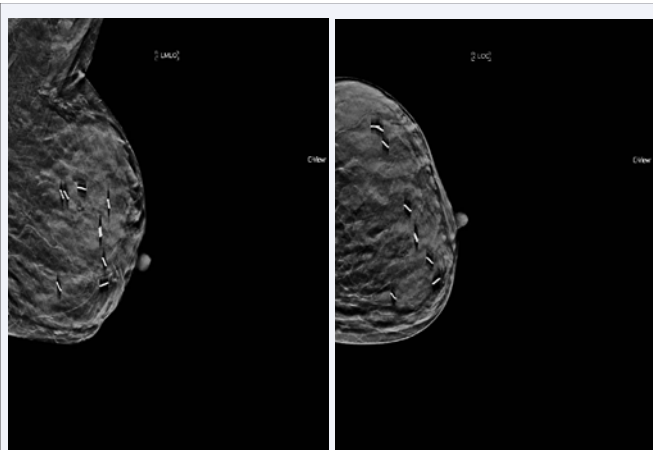


Figure 3 Post-operative images of the left breast in a 37-year-old woman presenting with gradual left breast enlargement over 6 years. (a) Craniocaudal (CC) and (b) MLO view of the left breast demonstrates complete surgical removal of the mass and associated calcifications related to PASH, with normalization of the breast size.

of PASH have been reported in up to 23% of benign and malignant breast specimens [1]. It is much rarer for PASH to be the primary pathological process of a breast lesion. Primary PASH usually presents as a focal asymmetry or mass by mammography, or clinically as a palpable lump. The average size of a mass in PASH has been reported to be 4-5 cm, with the range of diameters being 1cm -11cm [1, 2, 5, 6, 8, 9]. An unusual finding of our case is the large size of the lesion, with the extent of PASH reported at 15cm.

On mammography, PASH appears most commonly as a non-calcified mass or localized region of increased stroma with a concordant well-defined, hypoechoic mass on ultrasound. The relatively nonaggressive appearance of the mammogram and ultrasound findings of PASH usually leads to an overall “probably benign” BI-RADS 3 assessment. An unusual finding in this case was the presence of diffuse, round, and amorphous calcifications on mammography, since PASH lesions typically lack calcifications [10]. Although most calcifications associated with PASH can be accounted for by the histological presence of concomitant benign disease processes, a malignancy or a combination of malignancy and PASH should always be considered in such cases [10]. A BI-RADS 4 assessment was assigned in this case due to the complexity of the findings and associated calcifications. The presence of calcifications in this particular case was likely due to concurrent sclerosing adenosis and fibrocystic changes, however, this highlights the fact that although PASH usually has benign features on imaging, there have been rare cases of PASH presenting with radiological findings suspicious for malignancy [11]. For example, Ferrira et al. presented a case study of 26 patients with PASH, three of which were suspicious for malignancy based on imaging findings of irregular margins or an ill-defined or spiculated nature of the lesion [12]. Additionally, although PASH does not develop into carcinoma, the possibility of coexistent carcinoma in the vicinity of PASH does exist. There have been two relatively large studies demonstrating 10% and 4% of their total cases, respectively, having coexistent carcinoma at the site of PASH [1, 13].

Although the pathogenesis of PASH remains uncertain, it is believed that abnormal reactions to endogenous and exogenous hormones by fibroblasts play an important role. PASH has been associated with oral contraceptives, hormone replacement therapy, and gynecomastia in men [4]. Impressive decreases in extent of PASH in patients taking Tamoxifen therapy have been reported, and similarities between PASH and the intralobular stroma in the luteal phase of the menstrual cycle both lend support to the theory that hormonal stimulation plays a role in the etiology of PASH [2, 14]. In this case, rising hormone levels could explain the rapid breast enlargement that the patient experienced with each pregnancy.

When lesions identified on core needle biopsy as PASH are associated with concordant imaging findings and malignancy has been excluded, surgical excision is not necessary [15]. Rates of lesion growth, as demonstrated by follow up imaging, are variable and have been reported to be 0-71.4% [2, 7, 12]. Excision of PASH can be generally considered in growing lesions as well as in BI-RADS 4 or 5 lesions, and when core needle biopsy pathology results are discordant with imaging findings [15]. There have been variable reported rates for the recurrence of PASH after

excision, ranging from 0 to 28.5%, and rare reports of underlying malignancy highlights that PASH tumors require careful clinical and radiologic correlation and follow up [7, 12, 16].

CONCLUSION

Pseudoangiomatous stromal hyperplasia (PASH) is typically encountered as an incidental microscopic finding after biopsy or as a non-calcified breast mass by mammography but its presentation can vary. Breast imaging radiologists should therefore be aware of the diverse clinical and imaging findings of PASH in order to distinguish it from malignant processes.

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