Bahrain Medical Bulletin, Vol. 31, No. 3, September 2009

Pseudo-angiomatous Stromal Hyperplasia: Benign Tumor of the Breast

Suhair Al-Saad, MB Ch.B, CABS, FRCSI* Sara Mathew George, MBBS, MD, FRC Path**
Raja Al-Yusuf, MBBS, FRC Path***

Pseudo-angiomatous stromal hyperplasia (PASH) is a rare benign tumor of the breast which poses a clinical challenge in distinguishing it from malignancy. We are reporting a young married woman, who presented to the clinic with right breast painless large lump. The patient was managed surgically. Fine needle aspiration-cytology did not confirm the diagnosis. The final diagnosis was arrived at through histopathology.

Bahrain Med Bull 2009; 31(3):

PASH is a rare benign tumor of the breast; it was first described in 1986 by Vuitch et al as a breast lesion that simulated a vascular tumor[1]. They also noted small foci of PASH of mammary stroma were common in hyperplastic breast tissue from premenopausal women or during the luteal phase of the menstrual cycle. In women, PASH of mammary stroma has been described as either an incidental finding in neoplastic and non-neoplastic lesions or more rarely, as a palpable mass[2].

PASH of mammary stroma is usually described in females and usually seen in the child bearing age group. It is rarely seen but reported in children as young as 12 years and in elderly as old as 71 years[2-6]. This suggests that it is an aberrant response to the sex hormones.

The aim of this report is to present a case of PASH in a young patient and to increase the awareness of pathologists and breast surgeons for better diagnosis and management of such condition.

THE CASE

Twenty-eight years old Bahraini woman, married, and has one daughter presented to the breast clinic with a right breast lump of one year duration. The lump was increasing in size considerably but was painless and not associated with nipple discharge. Her daughter is almost 2 years old and she breast fed her for 3 months only. The patient had menarche at the age of 12; she had regular periods and is not on oral contraceptives. She has no significant past or family history.

On breast examination, the breast lump was large (12x6 cm) with obvious discrepancy in size between the two breasts. The lump was non-tender, occupying the medial half of the right breast and pushing the nipple outward. It was firm to hard solid mass with well defined borders and was mobile. The examination of the left breast was normal.

---

* Consultant Surgeon, Assistant Professor, Arabian Gulf University
** Consultant Pathologist
***Consultant Pathologist, Assistant Professor, Arabian Gulf University
Salmaniya Medical Complex
Kingdom of Bahrain
Email: hamsuh97@yahoo.com

Mammary ultrasound showed an oval shaped complex heterogeneous large mass (6x12 cm) with a central hypoechoic area with well defined borders occupying the medial half of the breast. The left breast was normal, see Figure 1 and 2.

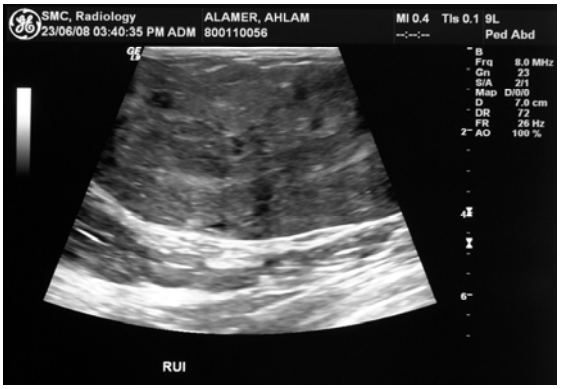

Figure 1: Mammary Ultrasound Shows an Oval Shaped Complex Heterogeneous Mass of Large Size (6x12 cm) with a Central Hypoechoic Area and Well Defined Borders Occupying the Medial Half of the Breast. The Left Breast Was Normal.

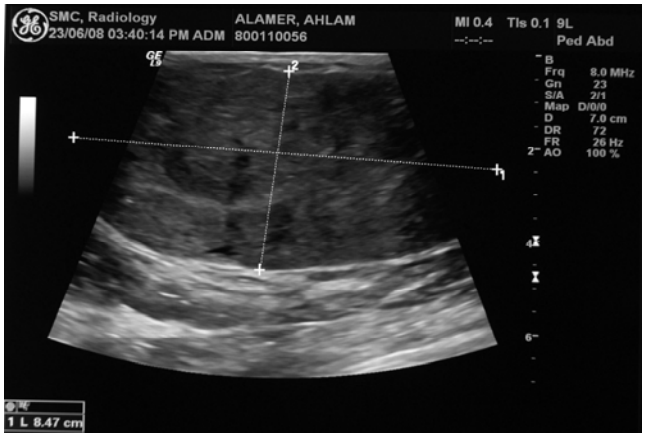

Figure 2: **Large Mass, Complex Heterogeneous and Central Hypoechoic Area**

Fine needle aspiration-cytology (FNAC) showed a highly cellular smear with ductal epithelial cells in small mono-layered sheets and branching. Some cells showed mild atypia in the form of mild nuclear enlargement (C3 category-atypia probably benign). The background showed high cellularity composed of many bare nuclei and dispersed spindle cells along with stromal fragments, see figure 3 and 4. The spindle cells showed enlarged nuclei, mild chromatin clumping and irregularity of the nuclear margins (figure 5), C4 category suspicious of malignancy. The overall cytology indicated a cellular fibroadenoma or a phyllodes tumor with a suspicion of malignancy.

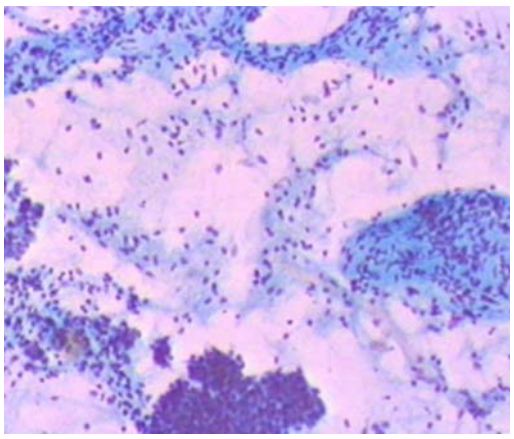

Figure 3: Low Power View Photomicrograph of FNAC Showing the Epithelial Cell Clusters, Stromal Fragments, Spindle Cells and Bare Nuclei in the Background

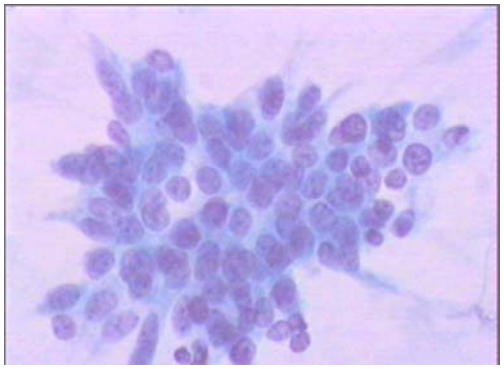

Figure 4: High Power View Photomicrograph of FNAC Showing the Benign Epithelial Cells

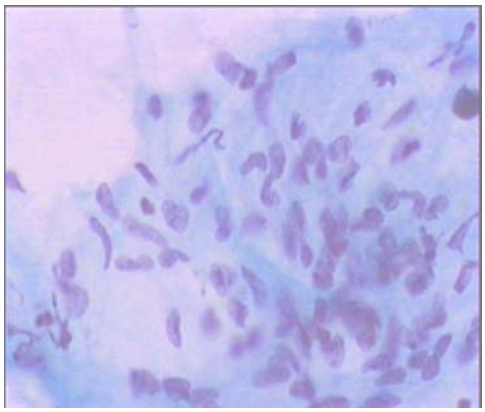

Figure 5: High Power View Photomicrograph of FNAC Showing the Spindle Cells with Mild Atypia in the Background

Based on the above findings, the patient had a wide excision with free margin around the mass and was sent for histopathological examination.

Gross histopathology examination showed capsulated fleshy mass measuring 10x10x6 cm and weighing 400 gm with attached fatty tissue.

Microscopic examination showed intermixed hyperplastic stroma and hyperplastic epithelial elements. The lobules and duct were separated by an increased amount of stroma with collagen, see Figure 6.

Focal apocrine metaplasia and cystic dilatation of the ducts were noted. The interlobular stroma showed complex pattern of inter-anastomosing spaces, which were extending into the intralobular area in some of the lobules, see Figure 7. These spaces had spindle shaped myofibroblasts resembling endothelial cells at the margins but did not show RBCs inside them, see Figure 8. Some of the myofibroblasts had enlarged and mild hyperchromatic nuclei.

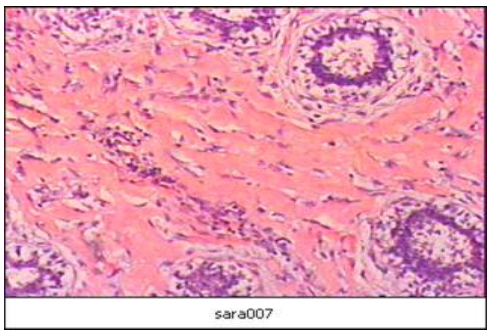

Figure 6: Low Power View Photomicrograph of Paraffin Section Showing the Expansion of the Interlobular Stroma by Network of Spaces, Spindle Cells and Collagen

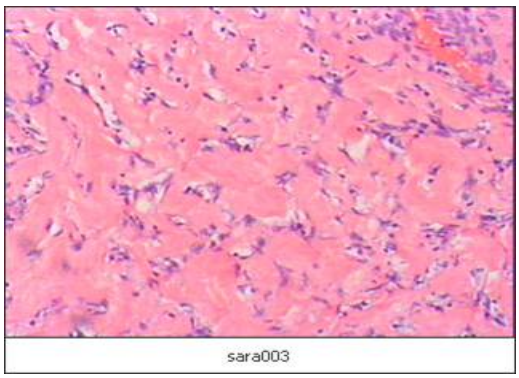

Figure 7: Low Power View Photomicrograph of Paraffin Section of the Interlobular Stroma with Diffuse Complex Network of Spaces

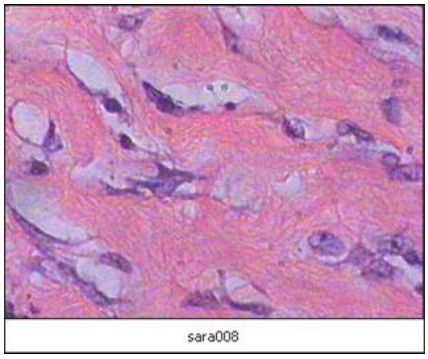

Figure 8: High Power View Photomicrograph of Paraffin Section Showing the Stroma with the Spindle Cells Outlining the Empty Pseudo-angiomatous Spaces

Immunohistochemistry (IHC) on the paraffin sections showed immunoreactivity for vimentin, CD 34 and actin in the spindle stromal cells thus confirming them to be myofibroblasts. These cells were not immunoreactive for CD 31, Factor VIII antigen, desmin, cytokeratin (MNF 116), estrogen or progesterone receptors.

A diagnosis of pseudo-angiomatous stromal hyperplasia of the breast was made.

DISCUSSION

Pseudo-angiomatous stromal hyperplasia of the breast is a benign tumor; several cases were reported from different parts of the world suggesting that it has no regional preference[7]. Clinically, it is usually unilateral, painless, palpable mass with a rapid growth, which is typical of the presentation of our patient. Bilateral involvement is rare[3]. Massive enlargement may make it difficult to differentiate from Phylloides tumor[5,8]. Pseudo-angiomatous has also been reported as an axillary mass[6].

Mammography, ultrasonography and MRI studies are usually difficult to differentiate PASH from other benign lesions of the breast[9-11]. Lesions of the breast have a varied sonographic appearance.

A retrospective sonographic study of 13 pathologically proven cases of PASH showed most lesions to be hypoechoic in echotexture. Hyperechoic and complex heterogeneous pattern with a central hypoechoic area were rarely seen and they rarely demonstrate posterior acoustic shadowing. The lesions are mostly ovals with the long axis of the lesion parallel to the chest wall.

Knowledge of the spectrum of morphologic features shown on sonography can be helpful in the diagnosis of this entity. It may be detected in an asymptomatic patient on Breast Imaging-Reporting and Data System (BI-RADS) type 3 which suggests a probably benign lesion.

Fine needle aspiration-cytology (FNAC) is not diagnostic of the lesion as noted in this case. In this case, it was suspicious of malignancy. In a retrospective review of 10 cases, FNAC did not suggest PASH in any case and the most common diagnosis was cellular fibroadenoma, the other diagnosis were schwannoma, neurofibroma and fibrocystic changes with atypia[12-15].

The lesion is mainly diagnosed histologically. Nodular PASH is relatively rare and consists of well demarcated lesion with smooth external surface which resembles a capsule. The cut section is homogenous[16]. Histologically the tumor is characterized by abundant fibrous stroma containing non-vascular slit-like spaces and scattered ducts and lobules. Unusual variants showing predominantly giant cells have been reported[17]. It is important to differentiate it from low grade angiosarcoma as the slit-like spaces will mimic vascular spaces. The reactivity for CD34 and non-immunoreactivity for factor VIII antigen will rule out a vascular lesion[4,18]. The other lesions to be differentiated are hamartomas and myofibroblastoma[16].

The management is to have a wide local excision and recurrence is rare if the margins are clear[2,16]. Tamoxifen has also been used in the management with encouraging results[19].

CONCLUSION

A case of Pseudo-angiomatous Stromal Hyperplasia presented. The patient was managed surgically. Follow up did not reveal any recurrence.

REFERENCES

1. Vuitch MF, Rosen PP, Erlandson RA. Pseudoangiomatous Hyperplasia of Mammary Stroma. Hum Pathol 1986; 17: 185-91.
2. MFG Milanezi, FP Saggioro, SG Zanati, et al. Pseudoangiomatous Hyperplasia of Mammary Stroma Associated with Gynaecomastia. JClin Pathol 1998; 51: 204-6.
3. Singh KA, Lewis MM, Runge RL, et al. Pseudoangiomatous Stromal Hyperplasia. A Case for Bilateral Mastectomy in a 12-year Old Girl. Breast J 2007; 13(6): 603-6.
4. Mansouri D, Mrad K, Sassi S, et al. Pseudo-angiomatous Hyperplasia of Mammary Stroma: A Case with Gigantomastia. Ann Pathol 2004; 24(2): 179-82.
5. Zúbor P, Kajo K, Dussan CA, et al. Rapidly Growing Nodular Pseudoangiomatous Stromal Hyperplasia of the Breast in an 18-year-old Girl. APMIS 2006; 114(5): 389-92.
6. Lee JS, Oh HS, Min KW. Mammary Pseudoangiomatous Stromal Hyperplasia Presenting as an Axillary Mass. Breast 2005; 14(1): 61-4.
7. Sasaki Y, Kamata S, Saito K, et al. Pseudoangiomatous Stromal Hyperplasia (PASH) of the Mammary Gland: Report of a Case. Surg Today 2008; 38(4): 340-3.
8. Yoo K, Woo OH, Yong HS, et al. Fast-growing Pseudoangiomatous Stromal Hyperplasia of the Breast: Report of a Case. Surg Today 2007; 37(11): 967-70.
9. Navas Cañete A, Olcoz Monreal FJ, García Laborda E, et al. Pseudoangiomatous Stromal Hyperplasia: Magnetic Resonance Findings in Two Cases. Radiologia 2007; 49(4): 275-8.
10. Salvador R, Lirola JL, Domínguez R, et al. Pseudo-angiomatous Stromal Hyperplasia Presenting as a Breast Mass: Imaging Findings in Three Patients. Breast2004; 13(5): 431-5.
11. Mercado CL, Naidrich SA, Hamele-Bena D, et al. Pseudoangiomatous Stromal Hyperplasia of the Breast: Sonographic Features with Histopathologic Correlation. Breast J 2004; 10(5): 427-32.
12. Aron M, Ray R, Verma K. Pseudoangiomatous Stromal Hyperplasia of the Breast-Cytological Features of Two Cases and Review of Literature. Indian J Pathol Microbiol 2005; 48(2): 260-4.
13. Levine PH, Nimeh D, Guth AA, et al. Aspiration Biopsy of Nodular Pseudoangiomatous Stromal Hyperplasia of the Breast: Clinicopathologic Correlates in 10 Cases. Diagn Cytopathol 2005; 32(6): 345-50.
14. Lui PC, Law BK, Chu WC, et al. Fine-needle Aspiration Cytology of Pseudoangiomatous Stromal Hyperplasia of the Breast. Diagn Cytopathol 2004; 30(5): 353-5.
15. Hoda SA, Rosen PP. Observations on the Pathologic Diagnosis of Selected Unusual Lesions in Needle Core Biopsies of Breast. Breast J 2004; 10(6): 522-7.
16. Paul Peter Rosen. Rosens Breast Pathology. Second edition. Lippincott Williams and Wilkins 2001.Chapter 40, pg 757-66.
17. Comunolu N, Comunolu C, Ilvan S, et al. Mammary Pseudoangiomatous Stromal Hyperplasia Composed of Predominantly Giant Cells: An Unusual Variant. Breast J 2007; 13(6): 568-70.

18. Taira N, Ohsumi S, Aogi K, et al. Nodular Pseudoangiomatous Stromal Hyperplasia of Mammary Stroma in a Case Showing Rapid Tumor Growth. Breast Cancer 2005; 12(4): 331-6.
19. Pruthi S, Reynolds C, Johnson RE, et al. Tamoxifen in the Management of Pseudoangiomatous Stromal Hyperplasia. Breast J 2001; 7(6): 434-9.