Imaging of Benign Papillary Neoplasm of the Breast: Mammographic, Galactographic and Sonographic Findings

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Abstract

We have retrospectively reviewed the mammographic, galactographic and sonographic findings of our 15 patients with histologically proved benign papillary neoplasm of the breast. Ten (67%) of 15 patients had breast masses and central location in 8 cases. We analyzed the mammographic findings in aspect of number, contour, outline, location, density, calcification and associated disease. Mammographic findings showed a mass in 10 cases (67%) and dense breasts in 5 cases (33%). The almost masses were round (6 in 10 cases) and solitary (9 in 10 cases). None of them had calcification. Ten of 15 cases who had nipple discharge had galactogram performed. The galactographic findings showed abnormal intraductal filling defect (s) in all 10 cases, and duct dilatation in 3 cases (30%). Sonography was performed in all cases. Sonographic findings were cystic mass with intramural nodule in 6 cases (40%), solid mass in 4 cases (27%), single duct dilatation at subareolar area with intraechoic nodule in 2 cases (13%) and was negative in 3 cases (20%).

Key word : Imaging, Mammography, Galactography, Ultrasonography, Benign Papillary of Breast

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Benign papillary neoplasm of the breast is a common neoplasm associated with nipple discharge in women[1-4]. Breast papillomas can be solitary or multiple. Solitary papillomas are usually found in a subareolar location within major ducts, and patients commonly present with spontaneous nipple discharge. In contrast, multiple papillomas arising within the terminal duct lobular units are most frequently peripheral in location and less commonly patients present with nipple discharge.

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Women with solitary papilloma and multiple peripheral papillomas have a 4 per cent and 12 per cent risk of breast cancer respectively(5). We report the results of a retrospective study performed to determine the mammographic, galactographic and sonographic features of benign papillary neoplasm of the breast.

MATERIAL AND METHOD

The clinical presentation, mammographic, sonographic, galactographic and pathologic findings of these patients were retrospectivity analysed.

Ultrasonography was obtained with the high-frequency transducers using 7.5 to 12 MHz by the Acuson, and GE logic 700 machines. The patient was lying in supine oblique position, with a pillow under the shoulder. The patient's arm was extended behind the head.

The mammography was obtained by the good quality control of GE and Benette equipment as well as well-trained technicians. The patients had two standard projections examined, craniocaudal and oblique mediolateral views, for each breast. The additional views including cone-down spot compression, magnification or modified projections were sometimes used in order to clarify the lesion.

Galactography was routinely performed in patients presenting with spontaneous nipple discharge. The discharging duct was identified and cannulated with a No. 26 gauge sialogram needle, 60 per cent Urovideo was injected until there was a reversal of flow at the nipple or the patient complained of either pain or burning. Usually, only 0.5-1 ml. of the contrast material was injected. Besides the standard views, the subareolar magnified views were usually added with both craniocaudal and mediolateral oblique projections.

RESULT

Of the 15 patients included in this study, 10(67%) had nipple discharge and a palpable mass was associated in six patients. The discharge was serosanguineous in 6(60%) of 10 patients, bloody discharge in 3(30%) and milky discharge in one patient. Four (27%) patients had a palpable mass only and one patient presented with mastalgia (Table 1). All patients who underwent excisional biopsies of the breast from August 1992 to 1998 had histopathologically proved benign papillary neoplasm.

Table 1. Clinical presentation of intraductal papilloma.

Clinical presentation	No. of cases	%
Nipple discharge with palpable mass	6	40
Nipple discharge only	4	27
Palpable mass only	4	27
Mastalgia	1	6
Total	15	100

The average age of these patients at the time of presentation was 40 years old (range 18-62 year old). All patients had both mammography and sonography performed. Galactography was done successfully in 10 patients. The locations of the surgical excision were based on clinical, mammographic, sonographic and/or galactographic findings.

Five patients (33%) having nipple discharge showed negative mammograms due to having dense breasts. Mammographic findings were abnormal in 10(67%) of 15 patients. The ten abnormal

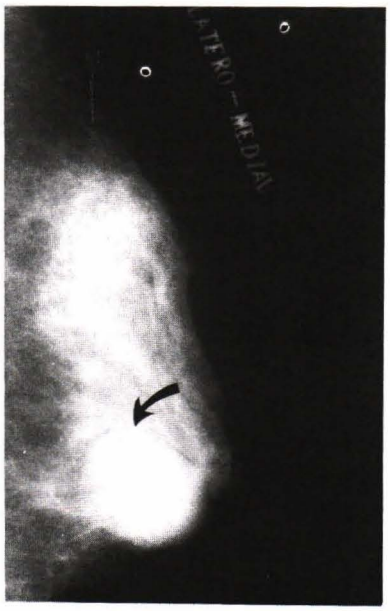


Fig. 1. Oblique mediolateral view of left breast showing a complete well defined oval isodensity mass with complete halo rim at subareolar area (arrow).

mammographic findings included a single mass in 9(90%) and multiple masses in 1(10%). The contour of the mass was oval in 6(60%) and lobulated in 4(40%). The outline was a complete, well-defined halo in 3(30%) (Fig. 1), complete, well defined without halo in 1(10%) (Fig. 2) and partial, well defined without halo in 6(60%) (Fig. 3). The masses were isodensity in 8(80%) and high density in 2(20%).

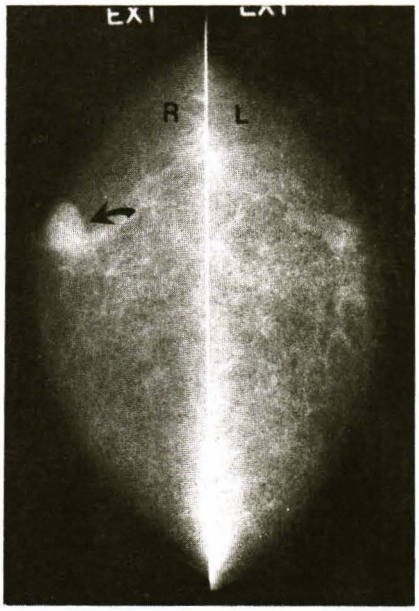


Fig. 2. Cranio-caudal view of both breasts showing a complete well defined microlobulated mass without halo rim at right subareolar area (arrow).

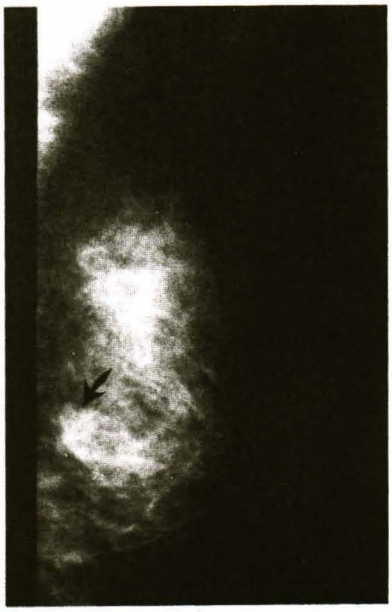


Fig. 3. Oblique mediolateral view of left breast showing a lobulated isodensity mass with partial well defined outline at deep central area (arrow).

Table 2. Mammographic findings.

Case	Number		Contour		Outline*			Density		Location	
	Single	Multiple	Oval	Lobule	I	II	III	Iso-	Hyper-	Central	Peripheral
1	+		+		+			+		+	
2	+		+		+				+	+	
3		+	+		+				+	+	
4	+			+		+		+		+	
5	+		+				+	+		+	
6	+			+			+	+			+
7	+			+			+	+		+	
8	+			+			+	+		+	
9	+		+				+	+		+	
10	+		+				+	+			+
Total	9	1	6	4	3	1	6	8	2	8	2

*I = Complete well-defined outline with halo
II = Complete well-defined outline without halo
III = Partial well-defined outline without halo

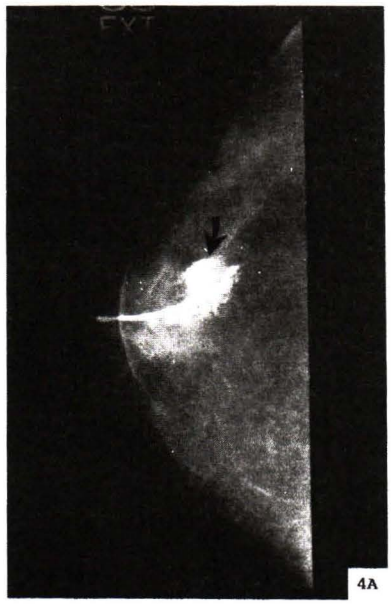


Fig. 4A. **Galactography of right breast (c-c view) showing an irregular, intraductal filling defect at subareolar area (arrow).**

Fig. 4B. **Galactography of left breast (c-c view) showing multiple intraductal filling defects at subareolar area (arrow).**

Almost all masses were located at the central subareolar area (8 patients). All mammographic findings showed no calcification, parenchymal distortion, skin thickening or nipple retraction. All lymph nodes were benign in appearance (Table 2).

The galactograms of all ten patients showed intraductal filling defects (Fig. 4A, B). The number of involved ducts was single in 7(70%) and multiple in 3(30%). There was filling of contrast into the large cyst with intracystic irregular filling defect in 2 cases (Fig. 5). Evidence of ductal dilatation was found in 3 cases (30%). Eight of ten patients had the lesion located at the central subareolar area (80%). (Table 3)

Twelve of 15 patients had abnormal sonograms. Sonographic findings were well-defined, oval-shaped cyst with intramural nodule in 6 patients (50%) (Fig. 6A, B) and well-defined hypoechoic solid mass in 4 patients (33%). The wall of the cysts were equally thin in 3 patients and thick in 3 patients. The solid masses were oval shaped in 2(50%) (Fig. 7) and lobulated in 2(50%) (Fig. 8). Mean diameter of the mass was 1.8 cm, varying from 1 to 3.1 cm. All solid masses had low echoge-

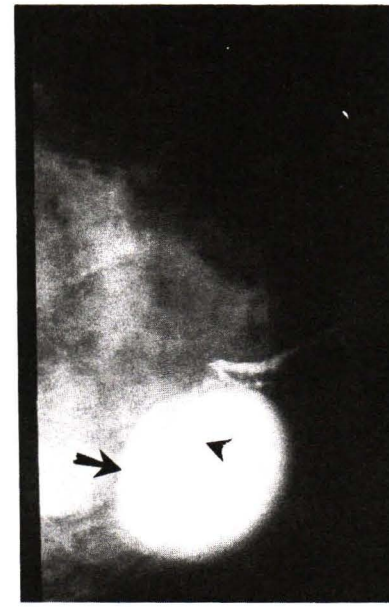
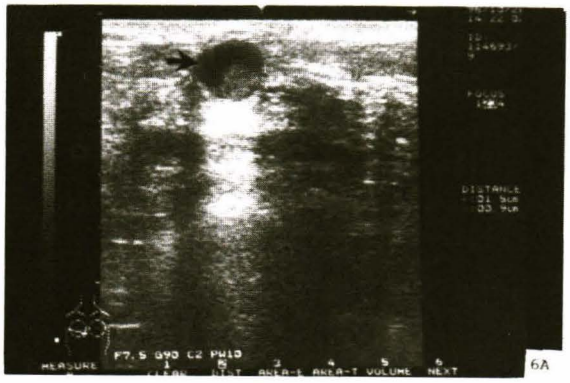


Fig. 5. **Galactography of left breast (c-c view) showing contrast filling into a cyst (arrow) with smooth wall contained intracystic filling defect (arrow head) at subareolar area.**

Table 3. Ductographic finding.

Case	No. of involved duct		Ductal dilatation		Location	
	Single	Multiple	Yes	No	Central	Peripheral
1	+			+	+	
2	+			+	+	
3	+			+	+	
4	+			+	+	
5		+		+		+
6		+	+		+	
7	+		+		+	
8		+		+	+	
9	+		+		+	
10	+			+		+
Total	7(70%)	3(30%)	3(30%)	7(70%)	8(80%)	2(20%)



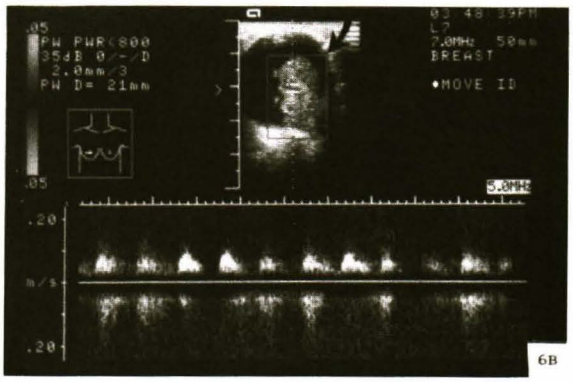


Fig. 6A, B **Ultrasonography of two cases showing cystic lesion with intramural nodule, both at right subareolar area (arrow).**

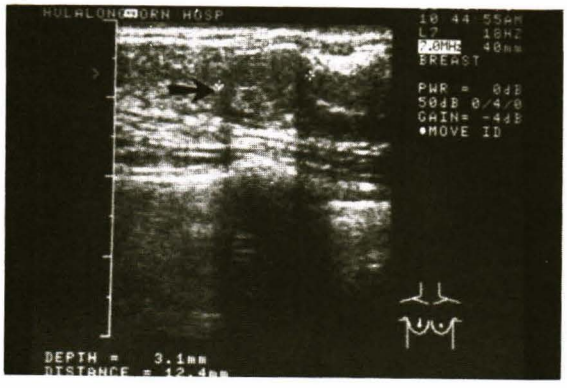


Fig. 7. **Ultrasonography showing a well defined oval shaped, inhomogenous low echoic mass at right subareoalar area (arrow).**

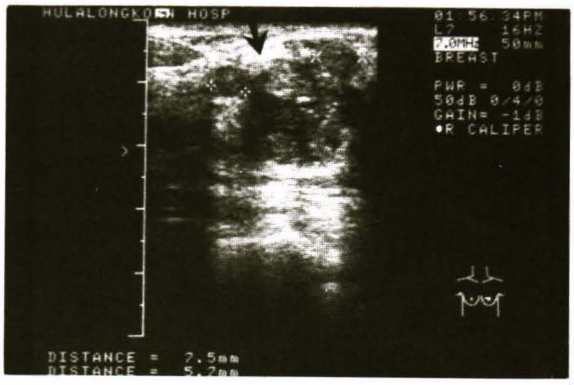


Fig. 8. **Ultrasonography showing a lobulated inhomogenous low echoic mass at left subareolar area (arrow).**

nicity being homogeneous in 2(50%) and inhomogeneous in 2(50%). (Table 4) There were 2 patients (17%) with single duct dilation at the subareolar area with intraductal echoic nodule (Fig. 9).

Table 4. Sonographic findings.

Sonographic findings		No. of case	%
CYST		**6**	
Shape	- oval	6	100
Wall	- thin	3	50
	- thick	3	50
Outline	- well define	6	100
Intramural nodule		6	100
SOLID		**4**	
Shape	- oval	2	50
	- lobulated	2	50
Outline	- well define	4	100
Echogenicity (low)		4	100
	- homogeneous	2	50
	- inhomogeneous	2	50

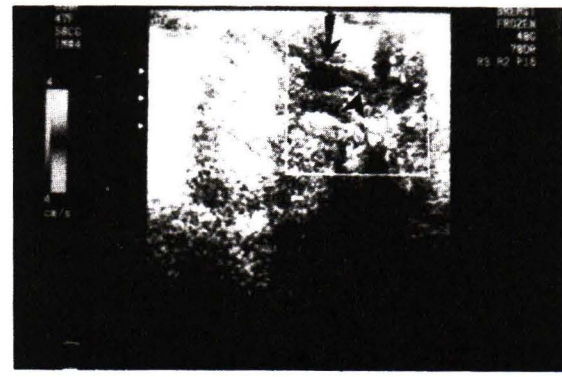


Fig. 9. Ultrasonography showing focal dilatation of a proximal duct at left subareolar area (arrow) with intraductal mass (arrow head).

DISCUSSION

Papilloma is a benign fibroepithelial tumor of the breast which represents 1-1.5 per cent of breast tumors. Usually, centrally occurring papillomas are solitary and associated with a slightly increased risk of breast carcinoma, but this relationship remains controversial[6-9]. Pathologically, a breast papilloma has masslike projections that consist of arborescent fronds attached to the inner mammary duct wall by a stalk containing a fibrovascular core. These typically measure 2-3 mm in diameter. Ductal ectasia is associated with papillomas and was seen in 30 per cent of our patients by galactography.

Nipple discharge is the most common and dominant clinical sign of breast papillomas in about 64-88 per cent of patients, typically being serosanguineous[7,8,10]. In our study, we found 40 per cent of patients having discharge with mass, 27 per cent of patients having mass only and 27 per cent having discharge only.

Papillomas are frequently not seen on mammograms because of their small size, lack of associated calcification or fibrosis[9]. But only 33 per cent of our patients had negative mammographic findings according to their dense breasts. The mammographic features of papillomas which we found were solitary isodense masses with oval shape, partial well defined outline, without halo rim and calcification, and predominant subareolar location.

Galactography has been advocated as the diagnostic procedure of choice in patients with nipple discharge[1-4]. Typically, a papilloma will cause either a smooth filling defect or a complete obstruction. Basically, ductographic findings suggestive of carcinoma include irregular filling defect (s), ductal abnormality (distortion, displacement, and /or stenotic encasement), complete obstruction and /or contrast extravasation[2,11]. Owing to the significant overlapping in ductographic findings between benign and malignant lesions, one cannot reliably differentiate between carcinoma and benign papillomas[11].

Sonography provides benefit in cystic lesions, all of them having a typically contained intramural nodule. For the solid mass, ultrasonographic features show the benign appearances. If it is a small intraductal lesion, ultrasound may be helpful in identifying the focal duct dilation with intraductal mass, as found in our two cases. Nevertheless, the intraductal mass can not be diagnosed for certain as a benign or malignant lesion.

In conclusion, most patients with benign papillary neoplasm of the breast had serosanguineous nipple discharge. The mammography revealed a benign isodense mass at the subareolar region. Galactography showed an intraductal filling defect but did not allow accurate differentiation of benign

from malignant lesions. Excisional biopsy should be considered whenever galactographic findings are abnormal. Sonography gave the pathognomonic feature of a cystic lesion with intramural nodule. The development of good high resolution ultrasonographic equipment pays an important role in detecting mammary duct dilation with an intraductal mass.

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REFERENCES

1. Tabar L, Dean PB, Pentek Z. Galactography: the diagnostic procedure of choice for nipple discharge. Radiology 1983; 149: 31-8.
2. Tabar L, Morton Z, Kadas L. Galactography in the examination of secretory breasts. Am J Surg 1974; 127: 282-6.
3. E.R.Woods. Solitary Breast Papilloma: Comparison of Mammographic, Galactographic and Pathologic Findings. AJR 1992; 159: 487-91.
4. Gulay H, Bora S. Management of nipple discharge. Journal of the American College of Surgeon 1994; 178: 471-4.
5. Sylvia H. Heywang Kobrunner, Ingrid Schreer, D.David Dershaw: Diagnostic Breast Imaging, page 180, Thieme Stuttgart, New York 1997.
6. Ohuchi N, Abe R, Kasai M. Possible cancerous change of intraductal papillomas of the breast. Cancer 1984; 54: 605-11.
7. Murad TM, Contesso G, Mouriesse H. Papillary tumors of large lactiferous duct. Cancer 1981; 48: 122-33.
8. Cardenosa G, Eklund GW. Benign papillary neoplasm of the breast; mammographic findings. Radiology 1991; 181: 751-5.
9. Paulus DD. Benign disease of the breast. Radiol Clin North Am 1983; 21: 27-50.
10. Yang WT, Suen M, Metrreweli C. Sonographic features of benign papillary neoplasms of the breast: review of 22 patients. Journal of Ultrasound in Medicine 1997; 16: 161-8.
11. Diner WC. Galactography: mammary duct contrast examination. AJR 1981; 137: 853-6.

ลักษณะภาพของเนื้องอกเต้านมชนิดปาปิลโลมา

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การวิเคราะห์ลักษณะภาพแมมโมแกรม กาแลกโตแกรมและอัลตราซาวด์ของเนื้องอกเต้านมชนิดปาปิลโลมาในผู้ป่วยจำนวน 15 ราย พบดังนี้ แมมโมแกรมในผู้ป่วย จำนวน 15 ราย พบมีความผิดปกติ จำนวน 10 ราย มีลักษณะภาพเป็นก้อนกลมขอบเขตชัดเจนก้อนเดียวอยู่ที่ตำแหน่งตรงกลางใต้หัวนม กาแลกโตแกรม ในผู้ป่วย จำนวน 10 ราย ทุกรายจะพบมีก้อนอยู่ภายในท่อน้ำนม อัลตราซาวด์ของผู้ป่วย จำนวน 15 ราย ให้ลักษณะภาพที่เฉพาะเจาะจง 6 ราย คือ เป็นถุงน้ำที่มีก้อนเนื้ออยู่ภายใน ลักษณะภาพอื่นที่พบได้แก่ เป็นก้อนเนื้อจำนวน 4 ราย เป็นก้อนเนื้อขนาดเล็กอยู่ภายในท่อน้ำนมที่ขยายใหญ่ จำนวน 2 ราย และไม่พบความผิดปกติ จำนวน 3 ราย

คำสำคัญ : เนื้องอกเต้านม, ปาปิลโลมา, การตรวจทางรังสี

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