

가

1

. 2 . 3

: 가

:

24

: 24 9 , 15 . 5 (56%),
 2 (13%) . (7 , 78%), (8 , 89%)
 5 (33%), 7 (47%), 2 (13%)
 . 4 (27%) .
 6 (67%), 7 (78%) . 9 5 (56%)
 (6 , 40%) (4 , 27%) . (12 , 80%)

: 가

가

, 가 가 가

(33 - 48%), (14 - 33%), (14 - 28%), 1999 11 2002 3
 (2 - 11%) 가 8 - 15% 45
 (1 - 3). 가 24 .
 가 가 (1, 3).
 가 , 가
 (2 - 4). 15 24
 가 가 3/4 .
 가 1 cc
 (Telebrex 30
 meglumine; Guerbet, Paris, France)
 0.5 - 1.5 cc 가 .
 가 (5).

¹가²³가

sinus), (segmental duct), (subseg-
mental duct) , (Fig. 1A, 2A) 2 (13%) (Fig. 3A) 5 (56%)
(punctate) (amorphous)
가 (clustered) (segmental)
(punctate)
(amorphous)
가 가 가
(Fig. 1B, 2B).
4 3
(comedonecrosis) (Fig. 1C) 1

24 13 , 가 2 ,
7 , 2 45.3 (28 - 67
)
(Table
1).

Table 2

Table 1. Color of Nipple Discharge According to Pathology

	IDCa	DCIS	IDPa	FCC	TOTAL
Bloody	1	7	8	2	18 (75%)
Serous	1	0	4	0	5 (21%)
Watery	0	0	1	0	1 (4%)

IDCa: Invasive ductal carcinoma, DCIS : Ductal carcinoma in situ, IDPa : Intraductal papilloma, FCC: Fibrocystic change

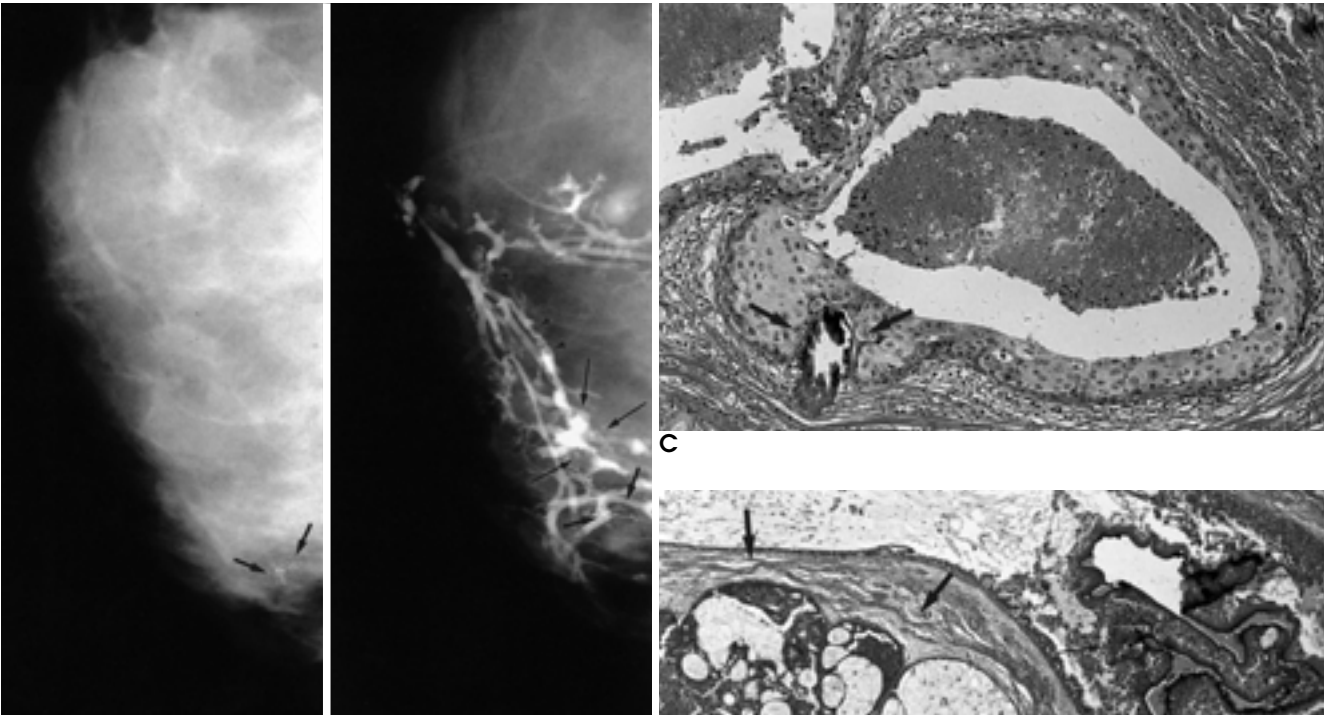


Fig. 1. 28-year-old woman with bloody nipple discharge.
A. Right mediolateral view shows clustered microcalcifications in lower portion (arrows) without definite mass.
B. Galactography shows diffuse multiple irregular intraductal filling defects (arrowheads) in segmental duct, subsegmental ducts and terminal ducts. Ductal stenosis not opacified by contrast (thick arrows) is noted in the calcific foci. Focal area of ductal distortion is also seen in the distal portion of the calcifications (thin arrows).
C. Comedonecrosis with dystrophic calcification (arrows) is found in the tumor. (H & E, $\times 100$)
D. Photomicrograph reveals ductal carcinoma in situ (thick arrows) surrounding papillary epithelial hyperplasia (thin arrows). (H & E, $\times 40$) The size of tumor was 2.5×2.0 cm.

(Fig. 3B).

가 (5 , 56%) (Fig. 1B)
(6 , 40%) (4 , 27%)
(Fig. 3A, Fig. 4A)

(Fig. 1D).

2 1
1

(4 , 27%) (Fig. 4A)
(6 , 67%)
(Fig. 2B)
(67%) (Fig. 2B) (7 , 47%) (Fig. 3A)
(7 , 78%)
(Fig. 1B).

Table 2. Galactographic Findings of Intraductal Pathology

	Malignancy (%)	Benign (%)
	N = 9	N = 15
Calcification	5 (56)	2 (13)
Location		
Lactiferous sinus	0	5 (33)
Segmental duct	7 (78)	7 (47)
Subsegmental duct	8 (89)	3 (20)
Pattern		
Dilatation	1 (11)	4 (27)
Stenosis	6 (67)	1 (7)
Obstruction	6 (67)	7 (47)
Distortion	7 (78)	0
Filling defect	6 (67)	12 (80)
Irregular	5 (56)	2 (13)
Lobular	1 (11)	4 (27)
Oval	0	6 (40)
Single	1 (11)	12 (80)
Multiple	5 (56)	0

가
(3, 6).
가
가 (3).
8 - 15%
Diner
(debris)
가
(7).

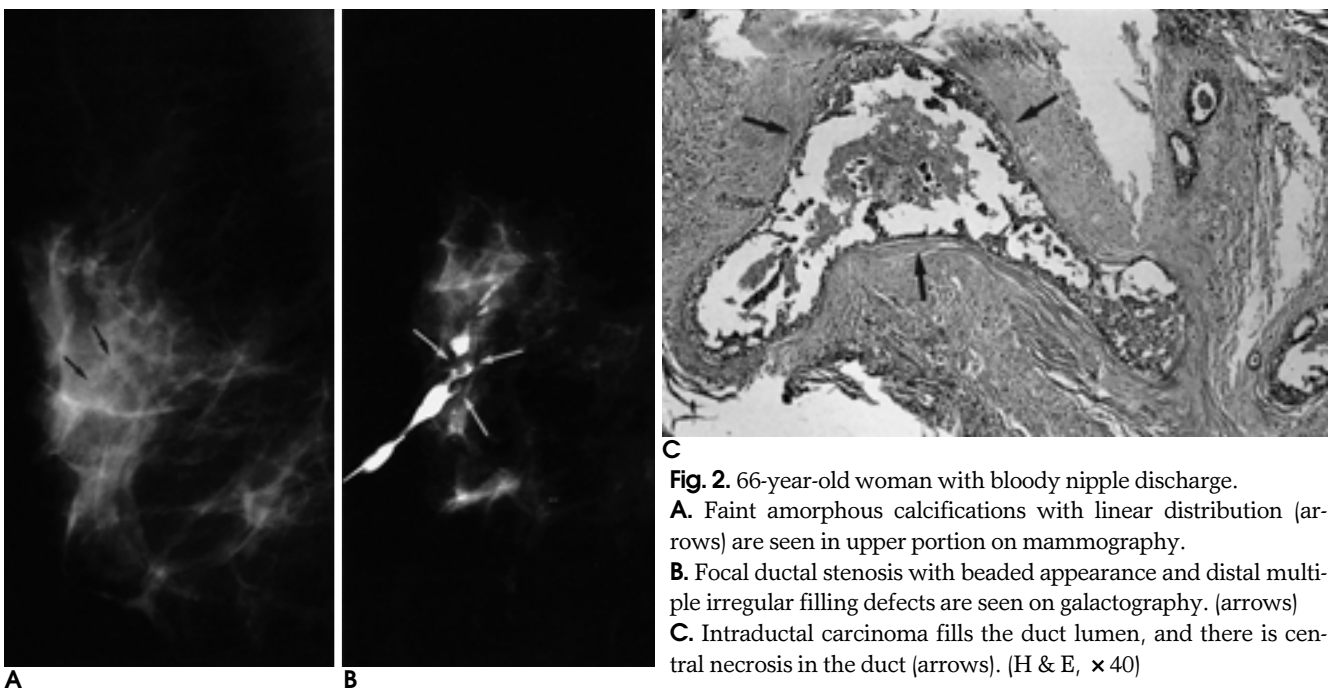
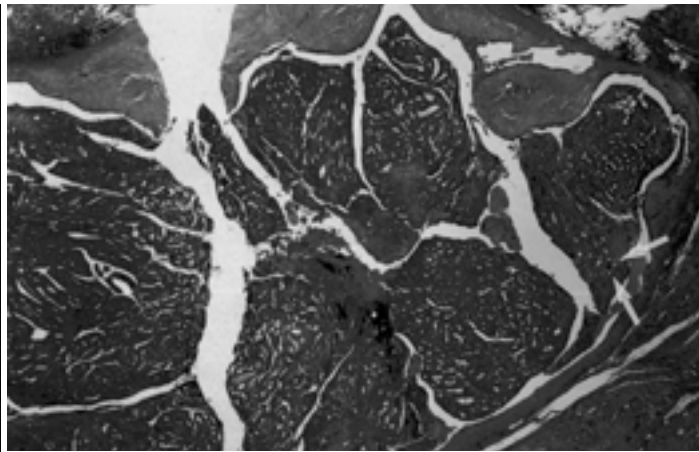


Fig. 2. 66-year-old woman with bloody nipple discharge.
A. Faint amorphous calcifications with linear distribution (arrows) are seen in upper portion on mammography.
B. Focal ductal stenosis with beaded appearance and distal multiple irregular filling defects are seen on galactography. (arrows)
C. Intraductal carcinoma fills the duct lumen, and there is central necrosis in the duct (arrows). (H & E, $\times 40$)



A



B

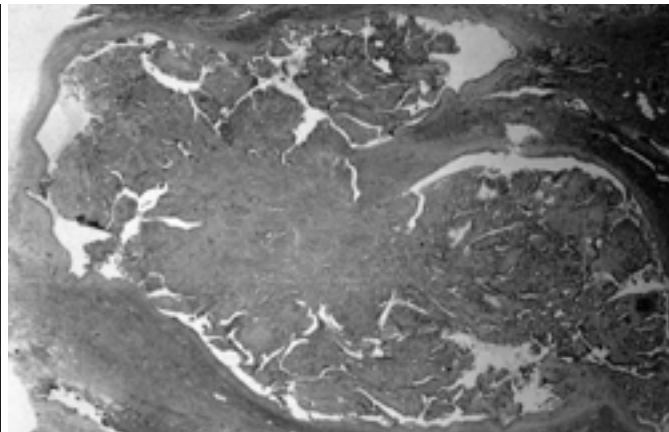
Fig. 3. 38-year-old woman with bloody nipple discharge.

A. Galactography shows an irregular shaped filling defect with ductal obstruction in subsegmental duct (arrows). Punctate calcifications are seen in the filling defect.

B. 0.7cm sized intraductal papilloma completely fills the duct and calcification (arrows) is found in the papilloma. (H & E, × 12.5)



A



B

Fig. 4. 35-year-old woman with bloody nipple discharge.

A. Galactography shows a lobular shaped single filling defect (arrows) in segmental duct with mild distal duct dilatation.

B. A dumbbell-shaped papilloma with multiple papillary fronds is seen in the dilated duct (H & E, × 12.5).

100 (63%), (31%) (2) (66%) 가 가 (8, 9). Hou (8) 181
(69%), (54%), (38%), 가 (28%) 가

Dinkel HP (9)

161

가

가 (8) 가 .
(6 , 67%)

가 가

Slawson (6)

가

24 가

(9/24, 37.5%). (8).

가 가 37.5%

가 가

가(5/9, 56%) (2/13, 15%)
(3/4)

가 가

가 가 (2)

38% 가 가 가

가 가

(4/13, 31%) (6/13, 46%),
(3/13, 23%)

(8) 가 Hou

(10)

(6 , 67%) (Fig. 2B)

(7 , 47%) (Fig. 4A)

82.9%가

1. Leis HP Jr. Management of nipple discharge. *World J of Surg* 1989;13:736-742
2. 가 . 1988;24:782-794
3. Tabar L, Dean PB, Pentek Z. Galactography: the diagnostic procedure of choice for nipple discharge. *Radiology* 1983;149:31-38
4. Sickles EA. Galactography and other imaging investigations of nipple discharge. *Lancet* 2000;356:1622-1623
5. . In : , 1995: 259-284
6. Slawson SH, Johnson BA. Ductography: how to and what if? *Radiographics* 2001;21:133-150
7. Diner WC. Galactography: mammary duct contrast examination. *AJR Am J Roentgenol* 1981;137:853-856
8. Hou MF, Huang TJ, Liu GC. The diagnostic value of galactography in patients with nipple discharge. *Clin Imaging* 2001;25:75-81
9. Dinkel HP, Trusen A, Gassel AM et al. Predictive value of galactographic patterns for benign and malignant neoplasms of the breast in patients with nipple discharge. *Br J Radiol* 2000;73:706-714
10. Cardenosa G, Eklund GW. Benign papillary neoplasms of the breast: mammographic findings. *Radiology* 1991; 181: 751-755

Galactographic Differentiation between Malignant and Benign Disease in Patients with Pathologic Nipple Discharge¹

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Purpose: To compare the galactographic findings of malignant and benign disease in patients with pathologic nipple discharge and to analyze the features suggesting malignancy.

Materials and Methods: In 24 patients in whom pathologic nipple discharge had occurred, the findings of pre-operative galactography were correlated with those of pathology.

Results: Nine of the 24 cases were malignant and the other 15 were benign. Intraductal calcification occurred in five malignant cases (56%) and two (13%) which were benign. Seven malignant cases (78%) involved the segmental ducts, and in eight (89%), the peripheral ducts below the subsegmental duct were involved. Five benign cases (33%) involved the lactiferous sinus, seven (47%) the segmental duct, and two (13%) the subsegmental duct. Distal duct dilatation occurred in four benign cases (27%), while ductal stenosis was noted in six cases (67%) and ductal distortion in seven (78%). A malignant tumor appeared as a multiple ($n=5$, 56%) or irregular ($n=5$, 56%) filling defect, and a benign tumor as a single ($n=12$, 80%), oval ($n=6$, 40%) or lobular ($n=4$, 27%) filling defect.

Conclusion: At galactography, a malignant tumor frequently appeared as an irregular multiple intraductal filling defect in a peripheral duct. A benign tumor, on the other hand, appeared as an oval or lobular single lesion. The presence of ductal stenosis, distortion and intraductal microcalcifications not opacified by contrast material suggest possible malignancy.

Index words : Breast neoplasms, diagnosis
Breast radiography
Galactography

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