Lesions of the Breast Associated with Discharge from the Nipple *

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DISCHARGE from the nipple is considered to be a normal, physiologic process only at certain times in a woman's life, namely, during the periods associated with reproduction and lactation. Nevertheless, a patient complaining of abnormal discharge is by no means a rarity.

Such patients fall into two major groups: 1) those with an associated significant mass and 2) those without such a mass. In the former group, the method of investigation and treatment seems fairly clear-cut, that is, biopsy of the mass with further treatment determined by the findings. The latter group, however, remains somewhat of an enigma to the conscientious clinician, largely because of the diversity of opinions as to the possibility of cancer being present.

Purpose

In an attempt to help find a solution to this problem, we undertook a detailed study of 100 breasts which had been removed by simple mastectomy for discharge from the nipple.

Questions that we sought to answer are: 1. What lesions of the breast are present in patients having discharge from the nipple? 2. Is there any tendency toward malignant transformation of intraductal papillomas? 3. Is there any danger of foci of malignancy being present in a breast having discharge from the nipple?

The answers to the last two questions are especially important, for upon them hinges the selection of treatment. So far as we know, this is the first study in which the entire breast has been thoroughly examined in a large number of cases of discharge from the nipple.

Review of the Literature

Incidence. The reported incidence of discharge from the nipple as a symptom of breast disease of all types varies from 5 to 10 per cent. Beasley [2] stated that discharge can be milked from at least 90 per cent of apparently normal breasts, while Jackson and associates [15] were able to obtain secretions from 43 per cent of patients having some type of complaint referable to the breast.

Age. The average ages of patients reported in most series were in the forties. River [22] found the average age of 52 patients with discharge from the nipple to be 40.2 years, with range from 17 to 78 years. In the group having bloody discharge who were studied by Fitts, Maxwell and Horn,[7] the average age of those with benign dis-

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ease was 42 years, and of those with carcinoma 54 years. In 59 cases of intraductal papilloma, Chester and Bell [5] found an average age of 49.4 years with range from 29 to 80 years.

Nature of Discharge. Donnelly [6] found the discharge to be bloody in 55 per cent of cases and serous in 21 per cent. Hinchey's [13] findings were similar, with 54 per cent of patients having bloody discharge and 22 per cent serous.

Axelrod [1] stated that the character of the discharge bears no relationship to the underlying lesion. On the other hand, Fleming and Drosd [8] found bloody discharge only in breasts having papillomas. Bloodgood [4] said that discharge either bloody or serous usually indicated a papilloma.

Incidence of Mass. Hollenberg [14] noted that 66 per cent of 44 patients with a bleeding nipple had a palpable mass, whereas Treves [28] found that 85 per cent of 200 patients who had a bleeding nipple had a demonstrable tumor. In 72 patients having discharge from the nipple and papillomas, Marshall and Marcum [20] found 20 (28 per cent) to have a palpable lump. Chester and Bell [5] found 43 (73 per cent) of 59 patients with papillomas to have lumps, it being the initial symptom in 14 cases.

Incidence of Associated Carcinoma. The reported incidence of carcinoma associated with discharge from the nipple varied greatly, chiefly because of different interpretations of papillary lesions. All degrees of incidence from 5 to 70 per cent have been claimed. Also, when only breasts which have a discharge from the nipple without palpable mass are considered, there is a wide difference of opinion as to the significance of this symptom. Bloodgood,[4] Bell,[3] and Joel,[16] as well as Knoflach and Urban,[18] have maintained that such breasts show no evidence of malignancy. Likewise, Stout,[26] Miller,[21] and Stowers [27] have said that a bloody discharge without a palpable mass is almost always due to papilloma.

At the other extreme, Lewison and Chambers [19] reported no palpable mass in 26 per cent of either their benign or malignant cases in which there was discharge from the nipple; and Kilgore, Fleming and Ramos [17] found no palpable mass in four (29 per cent) of 14 patients having undifferentiated carcinoma associated with discharge. Geschickter's [10] reported incidence of malignant lesion in patients with discharge and no palpable mass was 9 per cent. Others have reported sporadic cases of this nature.

Incidence of Discharge in Proved Carcinoma. When all carcinomas of the breast are grouped together, the incidence of discharge reported by various investigators is fairly low. Treves [28] found 2 per cent of 1,000 cases of carcinoma of the breast had bleeding from the nipple as the original symptom. Geschickter [10] reported bloody discharge associated with carcinoma in 4 per cent of 2,393 breasts, whereas Haagensen, Stout, and Phillips [12] found that only 1.3 per cent of carcinomas of the breast at Presbyterian Hospital in New York City were accompanied by serous or bloody discharge. In 53 (23.5 per cent) of 226 cases of comedocarcinoma, Stapley, Dockerty and Harrington [24] found discharge.

Methods and Materials

We obtained for study 100 breasts removed consecutively by simple mastectomy because of discharge from the nipple between January 1, 1945, and January 10, 1949. Breasts obtained from palliative mastectomy for carcinoma were excluded. Fifteen patients had bilateral simple mastectomies for discharge during the period covered by the study, giving a total of 85 patients.

All the breasts were cut on a slicing machine at an average thickness of about 2 to 4 mm. The individual slices were carefully inspected, and microscopic sections were made of representative portions and of any others which differed from the rest of the

specimen. A total of 590 new microscopic sections were prepared. The original microscopic slides also were studied when available. In 14 cases of intraductal papilloma, however, we could not find the original slides showing the lesion, nor could we find any papilloma in the sections of the breast we made for this study. Since in the original pathologic report no mention was made as to whether the lesions were of the gross or microscopic type (as we have classified them in our present study), we excluded these cases in the portion of the study in which we compared the two types.

Explanation of Terms. In this study we have avoided the term "chronic cystic mastitis" and have instead discussed the component lesions. In this way we hope to avoid some of the vagueness that has characterized much of the past writing on this subject. The benign lesions we noted in the sections were: replacement by fat, ductal ectasia, apocrine epithelium, apocrine cysts, fibroadenoma, blunt-duct adenosis, sclerosing adenosis, hyperplasia of ductal epithelium, papillomatosis, intraductal papilloma, and nonapocrine cysts. A brief comment on each lesion follows so that the terms which we use will be clear. The incidence of the various lesions can be seen in Table 1.

Replacement by fat seems to be a senescent change representing atrophy of the breast tissue itself.

Ductal ectasia (Fig. 1) has been called by other terms, for example, "dilated ducts beneath the nipple" or "comedomastitis," when an associated periductal mastitis exists. We have included in this category only those breasts in which all the ducts in the subareolar region were dilated to more than 3 mm. in diameter.

Apocrine epithelium presents a characteristic microscopic picture (Fig. 2). The cells are plump and tall with a small nucleus and a large amount of clear eosinophilic cytoplasm. The cells tend to be found on groups of so-called blunt-end ducts and have many papillary infoldings. Apocrine epithelium also may be found in the walls of larger ducts or may even make up an intraductal papilloma.

TABLE 1. *Incidence of Lesions in 100 Breasts Having Discharge from the Nipple*

Lesion	Number of Breasts Having the Lesion
Replacement by fat	27
Ductal ectasia	25
Apocrine epithelium	71
Apocrine cysts	30
Fibroadenoma	11
Blunt-duct adenosis	58
Sclerosing adenosis	11
Hyperplasia of ductal epithelium	33
Papillomatosis*	34
Intraductal papilloma†	58
Nonapocrine cysts	27

* Ten breasts had papillomatosis without intraductal papillomas.

† In 14 breasts tissue available did not show the lesion at time of our study.

As apocrine cysts (Fig. 2) we have included only cysts which are lined predominantly with this type of epithelium and which are visible to the naked eye (more than 1 mm. in diameter). They usually look blue in the fresh specimen.

Fibroadenomas were considered present only when they presented the classic appearance.

"Blunt-duct adenosis" (Fig. 2) is the term first used by Foote and Stewart [9] to designate those lesions in which the ducts apparently end abruptly without terminating in lobules but usually with some degree of dilatation. Usually the epithelial lining consists of flattened cuboidal cells, although linings of apocrine epithelium occur frequently.

Sclerosing adenosis (Fig. 3) is a lesion characterized by proliferation of poorly defined "acini," ordinarily in a dense connective-tissue matrix. The lobular pattern usually is apparent.

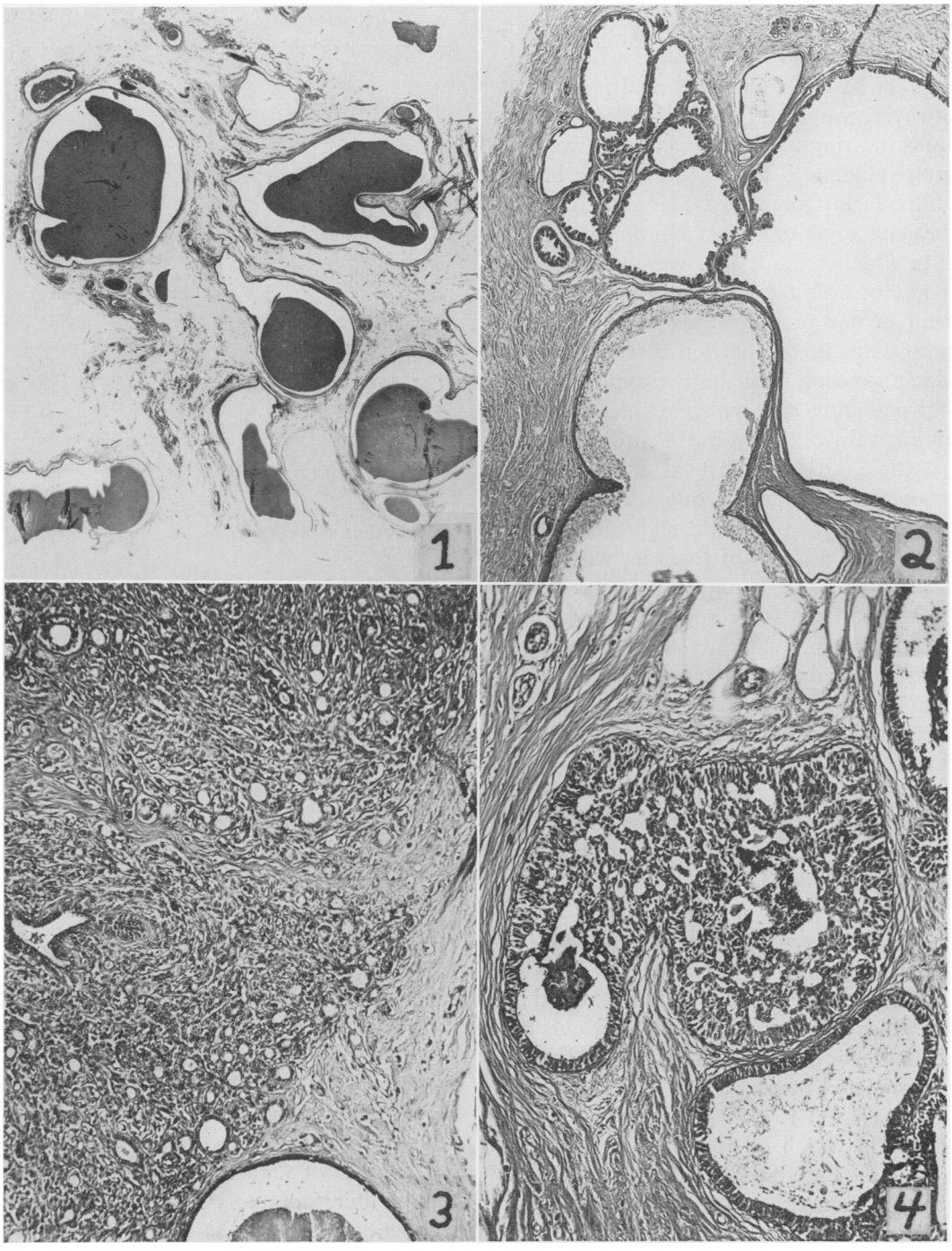

FIG. 1. Ductal ectasia in a 50-year-old woman. All the ducts in the subareolar region were involved (hematoxylin and eosin; × 5).

FIG. 2. At the upper left are seen a number of blunt-end ducts lined with apocrine epithelium; the tall, clear cells with papillary infoldings should be noted. At the right of the field is a macroscopic apocrine cyst. At lower center is a ductule loaded with fat-filled phagocytes. This specimen is from a 30-year-old woman (hematoxylin and eosin; × 30). →

As hyperplasia of ductal epithelium (Fig. 4) we included only those cellular proliferations of epithelium within the ducts in which no blood vessels or core of connective tissue was apparent.

"Papillomatosis" (Fig. 5) as we have used the term includes only the microscopic papillomas, usually seen involving multiple small ductules in any area. As opposed to hyperplasia of the ductal epithelium, papillomatosis is composed of lesions which have stalks of connective tissue.

"Intraductal papilloma" (Fig. 6) is the term we have used to designate the macroscopic adenomas, whose location is almost invariably within the larger ducts near the nipple. Although these have been called "malignant" in the past, we do not believe them to be malignant and we are not convinced that many, if any, are premalignant.

As nonapocrine cysts we have included macroscopic (more than 1 mm. in diameter) cysts whose lining is not of apocrine epithelium. This lining usually is of a flattened cuboidal type. Grossly, the cysts are filled with clear, watery fluid.

Observations

Age, Menopause, Childbearing. The average age for the entire group of 85 patients at the time of mastectomy for discharge of the nipple was 45.9 years, with extremes of 20 and 76 years, and the highest incidence was found between ages 40 and 49 (Table 2). The average and extreme ages of the patients as grouped by types of lesion are presented in Table 3. Replacement by fat, ductal ectasia and sclerosing adenosis tended to occur in the older age groups, whereas fibroadenomas, apocrine cysts, and intraductal papillomas tended to occur in a slightly younger group. The other lesions tended to parallel each other in regard to patients' ages at operation.

There were 34 postmenopausal patients, from whom 39 breasts were examined in this study. The average age of these patients was 56.8 years. Replacement by fat was present in 62 per cent of the breasts, as compared to 27 per cent in the entire series. Ductal ectasia, hyperplasia of ductal epithelium, and papillomatosis were slightly more common in breasts from postmenopausal patients than in the entire group, whereas gross intraductal papillomas were less common.

We could find no strong correlation of any of the lesions with the state of nulliparity or childbearing in this series. Twenty-six patients (31 per cent) were nulliparous and 56 (66 per cent) had borne children: we were unable to determine the status of three patients in this regard. Percentages showed that more of the patients having replacement by fat and ductal ectasia had borne children than those with any other lesion. Eighty-seven and 81 per cent, respectively, of these patients had borne children. This probably can be explained on the basis of their higher age (Table 3) and the greater probability of older women having had children.

Discharge. Clinical Descriptions With Different Types of Lesions. The clinical nature of the discharge in the 100 breasts is indicated in Table 4. The five instances of brown discharge mentioned in the case records have been classed with the bloody type of discharge because four of the five breasts showed blood in the ducts histologically and all five had intraductal papillomas.

FIG. 3. Edge of an area of sclerosing adenosis in the breast of a 48-year-old woman. The resemblance to adenocarcinoma should be noted. However, the nuclei are regular, mitotic figures are absent, and a lobular pattern is preserved (hematoxylin and eosin; × 115).

FIG. 4. Hyperplasia of ductal epithelium in a 46-year-old woman (hematoxylin and eosin; × 115).

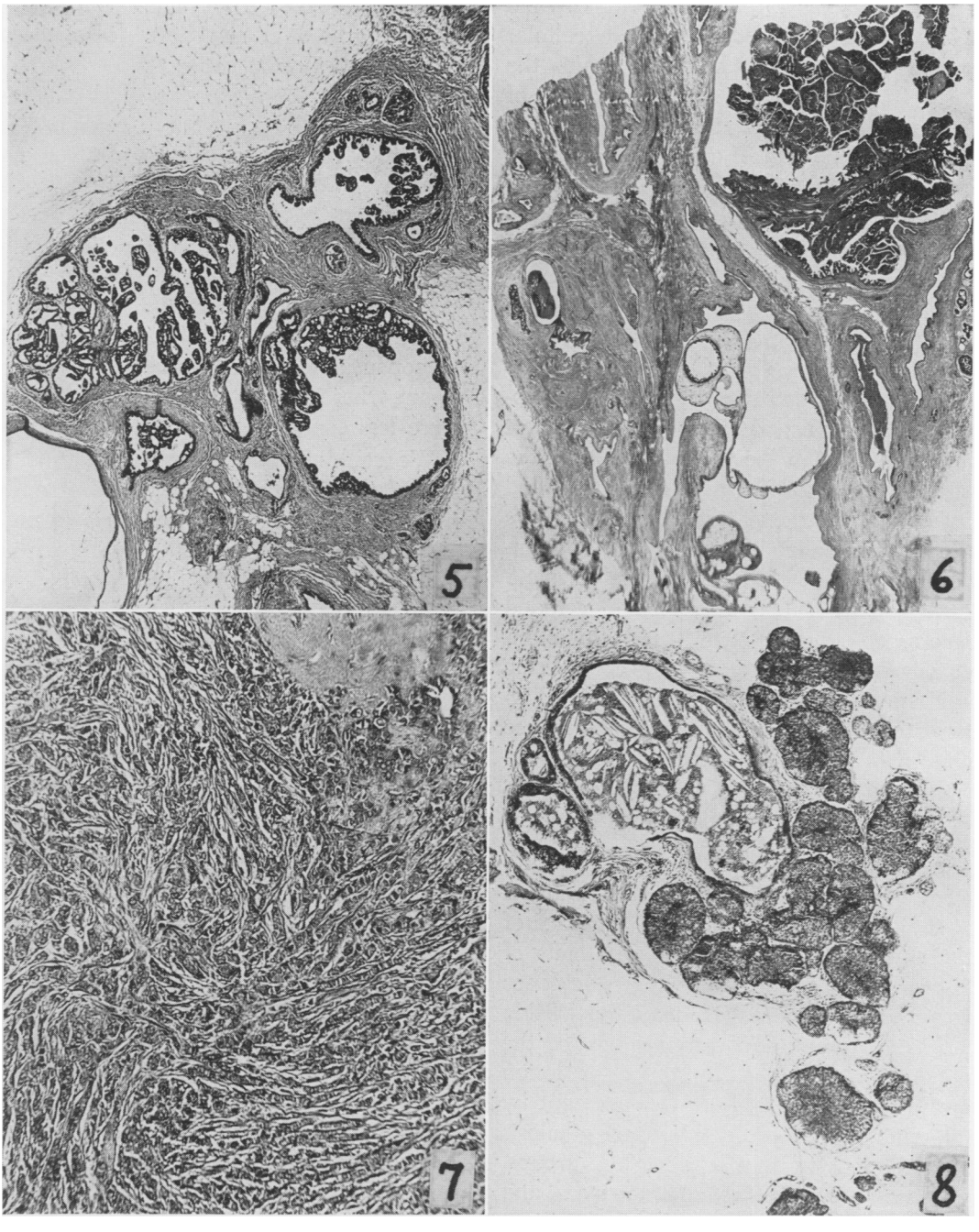

FIG. 5. Area of papillomatosis in the breast of a 47-year-old woman. Connective-tissue cores extend into the papillary processes (hematoxylin and eosin; × 22).

FIG. 6. Intraductal papillomas in the breast of a 20-year-old woman who had multiple gross papillomas in separate areas of each breast. The presence of minute cysts within the substance of the papilloma near the bottom of the field should be noted; one of these is lined with apocrine epithelium (hematoxylin and eosin; × 10).

FIG. 7. Adenocarcinoma, Grade 3, in the left breast of a 41-year-old woman whose right breast had carcinoma *in situ*. (See Fig. 8) The breast pictured here was not included in our present study, as there had been no discharge from it (hematoxylin and eosin; × 100).

FIG. 8. Comedocarcinoma, Grade 2, *in situ* in the right breast of a 41-year-old woman (hematoxylin and eosin; × 30).

TABLE 2. *Ages at Operation of 85 Patients Having Discharge from Nipple*

Age	Number
20–29	5
30–39	22
40–49	25
50–59	23
60–69	8
70–79	2
Total	85
Average	45.9 yr.
Range	20–76 yr.

The nature of the discharge was studied in connection with: 1) intraductal papillomas, 2) papillomatosis, 3) ductal ectasia with and without papillomas, and 4) all others.

There were 44 breasts in which tissue was available to make the diagnosis of intraductal papilloma. In all these the discharge had been noted clinically as bloody (57 per cent) or serous (43 per cent).

Histologically, 22 (50 per cent) of these breasts had erythrocytes in the ducts, 52 per cent of those with a history of bloody discharge and 48 per cent of those with a history of serous discharge having such demonstrable erythrocytes.

Of the ten breasts having papillomatosis, the discharge was clinically bloody in three and serous in four, to give a total of 70 per cent with bloody or serous discharge. Erythrocytes were seen in the ducts in two of these ten.

A total of 25 breasts presented ductal ectasia. In 13 of these an intraductal papilloma was associated; in four papillomatosis, and in eight neither. In all instances of ductal ectasia associated with intraductal papillomas or papillomatosis, the discharge was bloody or serous clinically, whereas in those associated with neither, five had been thought clinically to have a bloody discharge and three a dark green discharge, with a question of blood in two of these three.

Interestingly, none of the eight breasts having ductal ectasia without intraductal papillomas or papillomatosis had histologic evidence of blood in the ducts, while ten of the 17 associated with papillary lesions did. The discharge associated with ductal ectasia tends to be dark and may lead to an erroneous impression of being bloody.

As for others, a total of 24 breasts had neither papillary lesions nor ductal ectasia.

TABLE 3. *Ages at Operation of Patients Having Various Lesions of Breast*

Lesion	Age	
	Average	Range
Replacement by fat	57.5	30–76
Ductal ectasia	50.7	33–68
Sclerosing adenosis	49.1	36–63
Hyperplasia of ductal epithelium	47.3	20–68
Blunt-duct adenosis	46.8	20–63
Papillomatosis	46.6	20–68
Nonapocrine cysts	46.5	20–63
Apocrine epithelium	46.0	20–68
Intraductal papilloma	43.1	20–67
Apocrine cysts	42.9	20–63
Fibroadenoma	37.9	22–54

TABLE 4. *Clinically Noted Nature of Discharge in 100 Breasts*

Nature of Discharge	Number	Per Cent
Bloody		50
Sanguineous, serosanguineous	45	
Brown	5	
Serous		32
"Serous"	22	
Yellow	4	
Watery	3	
Clear	2	
Colorless	1	
Other		18
White or milky	6	
Green	6	
Blue-gray	2	
Cloudy	1	
Like pus	1	
Nonbloody	1	
Not stated	1	
Total	100	100

TABLE 5. *Duration of Discharge from Nipple to Time of Examination (100 Breasts)*

Duration	Discharge	
	Bloody	Non-bloody
Discovered at examination	1	8
0–13 days	7	2
2–4 weeks	13	0
1–3 mo.	7	8
4–6 mo.	6	10
7 mo.–1 yr.	8	4
1–2 yr.	3	9
2–3 yr.	0	2
3–4 yr.	0	2
More than 4 yr.	1*	6
Unknown	4	7
Total	50	58†
Average	4.6 mo.‡ 1.2 yr.‡	1.8 yr.‡

* Patient had a 20-year history; excluded from averages.

† Eight patients first had nonbloody, followed by bloody discharge.

‡ Instances discovered at examination excluded.

For 11 (46 per cent) of the breasts the clinician had recorded bloody or serous discharge, but erythrocytes were found in the ducts of only one of these breasts, and the discharge from that breast had been noted clinically as being serous. The clinical description of the discharge from the other 13 breasts was: green from three, milky from four, colorless from one, cloudy from two, like pus from one, blue-gray from one, and not stated from one. None of these 13 showed erythrocytes histologically.

Lesions Found with Erythrocytes Noted Histologically. A total of 29 breasts showed histologic evidence of erythrocytes in the ducts. Of these, 26 breasts had intraductal papillomas, and two papillomatosis. One of the breasts harboring an intraductal papilloma had also comedocarcinoma, Grade 2, *in situ*. No lesion could be found to explain the presence of erythrocytes in one breast. Thus a total of 97 per cent of the breasts showing blood microscopically harbored intraductal papillomas or papillomatosis.

Duration of Discharge. It was not possible to determine the duration of discharge from 11 breasts. For nine others discharge was first noted at physical examination (Table 5), and aside from those the shortest measurable duration of discharge was two days. The discharge from eight breasts was nonbloody at first and later bloody. Patients tended to seek medical advice earlier when the discharge was bloody than when it was not.

Periductal Mastitis. Of the 37 breasts showing periductal mastitis on our examination of the tissue, 19 were of slight degrees of severity and 18 were of more than slight degrees, but none reached the extreme (Table 6). Breasts affected in the slightest degree showed only a few sporadic regions of periductal lymphocytic infiltration, while those affected more severely showed, in addition, considerable lymphocytic infiltration, regions with some breakdown of fat, and phagocytes filled with fat and hemosiderin.

Periductal mastitis occurred with greatest frequency in breasts affected by ductal ectasia, with or without associated intraductal papillomas or papillomatosis. Among

TABLE 6. *Lesions Associated with Periductal Mastitis*

Lesion	Total Breasts	Periductal Mastitis	
		Number	Per Cent
Intraductal papilloma, total	58*	23	40
Tissue available for diagnosis	44	21	48
Papillomatosis	10	4	40
Ductal ectasia			
Without papilloma	8	5	63
With papilloma	17†	10†	59†
Others	24	5	21
Total	100	37	37

* Some of these probably are papillomatosis.

† These are listed also with intraductal papilloma and papillomatosis.

breasts having intraductal papillomas the incidence of periductal mastitis was slightly higher and its severity was slightly greater than among those having papillomatosis. The incidence of periductal mastitis was low in breasts which had neither ductal ectasia nor papillary lesions.

Presence of Mass. Of the 100 breasts studied, 17 were found on physical examination to have a discrete or localized mass and 25 were found to have multiple or diffuse masses (Table 7).

Of the 17 localized masses, three were localized thickenings, two were localized areas of induration and 12 were nodules. Of the 25 containing diffuse or multiple masses, six had diffuse thickening, 11 had diffuse nodularity, seven had multiple cystic masses and one had diffuse firmness.

Because of the multiplicity of lesions occurring together, it was not possible to correlate clinical impression of a mass with the lesion actually responsible.

Gross or microscopic papillomas were noted in 14 (82 per cent) of the 17 breasts having a discrete or localized mass and in 12 (48 per cent) of the 25 breasts having multiple or diffuse masses.

In the 44 breasts with diagnosis of intraductal papilloma from which we had tissue for verification, nine (20 per cent) had been found clinically to have a localized mass, and eight (18 per cent) had been found thus to have diffuse or multiple masses.

The 14 *cysts* (apocrine and nonapocrine) in breasts with multiple or diffuse masses represented an incidence (56 per cent) almost twice that of the five in breasts with localized masses (29 per cent).

Fibroadenomas were found in two breasts with localized masses; one of these was in the same breast as a papilloma. One fibroadenoma was found in a breast noted clinically as having a diffuse nodularity and microscopically as having cysts.

Ductal ectasia was noted in seven breasts with masses, two being localized and five diffuse. Of the eight breasts having ductal ectasia without papillary lesions in the whole series, four had a diffuse nodularity or thickening, one had retraction of the nipple, and three had nothing unusual palpable.

TABLE 7. *Mass Associated with Discharge from Nipple*

Lesion	Mass			
	Discrete		Multiple or diffuse	
	Number	Per Cent	Number	Per Cent
Papillomas	14	82	12	48
Cysts	5	29	14	56
Fibroadenomas	2	12	1	4
Ductal ectasia	2	12	5	20
No lesion to account for mass	2	12	6	24
Total	17*		25*	

* Many of these breasts had more than one lesion.

Pain. In 24 of the 100 breasts in this study, pain was associated with discharge from the nipple. Although it was not prominent in association with any particular type of lesion, its incidence was lowest (12 per cent) among those patients having ductal ectasia.

Multiple Papillomas. Reports in the literature have placed the incidence of multiplicity in papillomas anywhere from 17 to 89 per cent. Unless one does an extremely detailed study of breasts which have not been previously examined, the question of multiplicity is difficult to determine. If breasts having multiple microscopic papillomas in the same region are included, the percentage of multiplicity approaches 100 per cent. If only papillomas visible on gross examination found in definitely separate areas of the breast are included, multiplicity becomes much less common.

In our study of 44 breasts in which tissue showing gross papillomas (diagnosed in this paper as intraductal papillomas) was available, a total of possibly six breasts (14

TABLE 8. *Bilateral Breast Disease: 35 Patients (of 85)*

From present study (both breasts examined by us)			15*
Papillomas		8	
In one breast, different disease in other	5		
In both breasts	3†‡		
Other diseases in both breasts (no papillomas)		7	
From history (opposite breast, not in this study)			20
Benign lesions, not papillary		13	
With discharge	2*		
Papillomas (also in opposite breast studied)		4†	
Without discharge	3		
With discharge	1*‡		
Malignant lesions		3	
Adenocarcinoma, grade 3 (opposite breast in our study had comedocarcinoma, grade 2)	2		
Comedocarcinoma, grade 3, *in situ* with mass and bloody discharge	1*		
Total			35

* Bilateral discharge—19.
† Total bilateral papillomas—7.
‡ Bilateral papillomas with bilateral discharge—4.

per cent) seemed to have multiple gross papillomas in separate regions. Of these six, only two breasts from the same patient showed more than two gross papillomas from widely separate areas of the breast.

Bilateral Mammary Disease. Of the 15 patients from whom we examined both breasts histologically, five were found to have papillary lesions in only one breast; three were found to have them bilaterally; and seven did not have them in either breast (Table 8).

Twenty patients gave a history of surgical treatment on the breast not examined in this study. Thirteen of these breasts had been subjected to the surgical procedures for benign conditions other than papillary lesions, two of them having had discharge. Four had had papillary lesions, with one of these having a discharge from the nipple (all four of these patients also had papillary lesions in the breasts we studied). Three patients had a history of infiltrating carcinoma in the other breast, two of these being adenocarcinoma, grade 3, and the other a comedocarcinoma, grade 3, the latter having a mass and a bloody discharge. In one of these three patients, we found a comedocarcinoma, grade 2, *in situ*. We will discuss this case later. Thus, a total of 35 patients (41 per cent of the 85) had bilateral mammary disease and 19 had bilateral discharge (22 per cent).

Among 65 patients having papillary lesions in one breast examined by us, three (5 per cent) had them also in the opposite breast.

Association of the Various Lesions with Each Other. All the lesions noted on histologic examination of the breasts were tabulated to see whether any combinations tended to occur together. Our findings in this regard were as follows:

Replacement by fat tended to have no positive association with any of the proliferative lesions. In fact, it was not associated with other lesions as often as would be expected by its incidence in the whole series (decreased association).

Intraductal papilloma, surprisingly enough, also had a decreased association with most of the other lesions. Only with hyperplasia of the ductal epithelium and papillomatosis was the association much increased.

Papillomatosis, on the other hand, seemed to be more commonly associated with other proliferative lesions than its incidence in the series would indicate.

The proliferative lesions which tended to occur together were: blunt-duct adenosis, nonapocrine cysts, and apocrine epithelium, including cysts, hyperplasia of ductal epithelium, papillomatosis, and sclerosing adenosis.

Fibroadenoma did not tend to be associated with the other lesions.

Ductal ectasia showed little or no tendency to be associated with the majority of the proliferative lesions. The lesions most commonly associated with ductal ectasia

were apocrine epithelium, nonapocrine cysts, and blunt-duct adenosis. One may speculate that the apocrine epithelium might be responsible for the increased secretion in these cases, causing a general dilation of the ducts, with the blunt-duct adenosis and nonapocrine cysts being secondary phenomena.

Incidence of Malignancy. The search for malignancy in breasts having discharge from the nipple was one of the prime aims in this study. However, after careful search of the 100 breasts, only one breast (1.0 per cent) showed a clear-cut malignant lesion, and this was in a patient with proved carcinoma of the other breast.

Case Report

A white woman, 41 years old, was first seen at the clinic in September, 1948, with the complaint of having 2 masses in her left breast, first noted 4 weeks prior to admission. She had had 9 pregnancies, of which only 4 had been full term, the rest having ended in abortions.

Physical examination revealed a hard mass at 3 o'clock in her left breast as well as a small mass in her left axilla. No masses were noted in her right breast, but a bloody discharge was expressed from the right nipple.

On September 27, 1948, after preliminary biopsy revealed an adenocarcinoma, Grade 3, of the left breast (Fig. 7), left radical mastectomy was performed. No lymph nodes showed any evidence of metastasis.

On October 4, 1948, right simple mastectomy was performed. No evidence of malignancy was noted in the right breast at that time. However, in our present study a minute comedocarcinoma, Grade 2 (Fig. 8), and also an intraductal papilloma were discovered. Six years later this patient wrote that she was in good health.

As can be seen by comparing the photomicrographs of the 2 lesions, their histologic appearance is quite different; in all probability they are separate primary carcinomas.

Comment: This case, although unusual, points to the possibility of carcinoma in a breast having bloody discharge and no mass. Stewart [25] has emphasized that the most common precancerous lesion in the breast is carcinoma in the other breast, and such is probably true in our case.

Comment

Prognosis. Physicians who propose simple mastectomy for all breasts having discharge from the nipple give the following three reasons to justify the procedure: 1) Lesions producing discharge, i.e., "chronic cystic mastitis," epithelial hyperplasia, and papillomas, are premalignant. 2) Papillomas frequently are multiple, and after local excision of one a second operation may be necessary. The fear that papillomas are premalignant lesions enters into this reason also. 3) The incidence of carcinoma is high in breasts having a discharge even in the absence of a mass.

If any of the lesions associated with so-called chronic cystic mastitis, epithelial hyperplasia, or papilloma have a tendency to become malignant, we found no evidence of it in our study, although large numbers of all these lesions were found. Other investigators have reached similar conclusions. For example, Guerin [11] found that the incidence of carcinoma was not increased by so-called chronic cystic mastitis, while Snyder and Chaffin,[23] in following 107 cases of papillary disease of the breast for one to 30 years, found that none of those patients died of breast cancer when infiltrating cancer had not been present originally.

As for multiplicity of papillomas after exclusion of microscopic papillomas (which are not likely to produce discharge from the nipple), the incidence is not strikingly high. We found multiple gross papillomas in different parts of only six of the 44 breasts harboring an intraductal papilloma. More than two papillomas were present in widely separate areas in only two of these breasts and these were from the same patient.

If papillomas are not premalignant, the problem of multiplicity becomes unimportant. The worst that can be said is that a small percentage of such patients may have

to undergo more than one operation on a breast having discharge from the nipple.

The third point, high incidence of carcinoma in breasts having discharge even without a mass, received no support in this study. On careful investigation of 100 breasts having discharge from the nipple, only one carcinoma was found.

It is true that in this study we did not examine breasts removed by radical mastectomy for cancer associated with discharge from the nipple. However, interest in this aspect of the problem led us to investigate the incidence of carcinoma of the breast associated with discharge and without palpable mass. We found the incidence at this clinic to be very low, averaging less than one case per year. The discharge was almost always bloody. Similar findings have been reported by other investigators, as already cited; and our investigation will be reported at a later date.

Treatment

On the basis of all the afore-mentioned findings, we conclude that the treatment for discharge from the nipple *in the absence of a mass* should be conservative, that is, local excision of the offending duct if it can be localized. Otherwise the patient should be followed carefully, especially if the discharge is bloody, since in rare instances carcinoma may be present in the breast.

Summary

Examination was made of 100 breasts which had been removed from 85 patients by simple mastectomy for discharge from the nipple. Breasts removed as a palliative measure for carcinoma were excluded. The average age of all patients involved was 45.9 years, with extremes of 20 and 76 years. The breasts were cut on a slicing machine; the resulting specimens were examined grossly, representative and unusual portions were studied histologically, and the pathologic lesions were tabulated.

The nature of the discharge from the 100 breasts was recorded clinically as bloody in 50 cases, serous in 32, and other in 18. The discharge from breasts which contained intraductal papillomas (gross papillomas) always had appeared clinically to be bloody (57 per cent) or serous (43 per cent). Of 29 breasts in which erythrocytes were noted histologically in the ducts 97 per cent contained intraductal papillomas or papillomatosis. The average duration of bloody discharge at examination was 4.6 months; of nonsanguineous discharge 1.8 years.

Thirty-seven breasts showed some degree of periductal mastitis. This condition was most common in breasts having ducts dilated with secretions (papillomas and ductal ectasia). Of the 100 breasts, 17 had a localized mass or thickening and 25 had diffuse or multiple lesions. Nine (20 per cent) of 44 breasts containing intraductal papillomas showed clinical evidence of a mass. Of eight breasts having ductal ectasia without gross or microscopic papillomas, four had diffuse nodularity or thickening, one had nipple retraction, and three had nothing unusual palpable. Pain had occurred in 24 of the 100 breasts; it was not unusually prominent in association with any disease process.

Thirty-five of the 85 patients were found to have had bilateral breast disease: 15 by evidence in this study and 20 by history. Nineteen patients, the 15 represented in this study by both breasts and four others (total 22 per cent), had a history of bilateral discharge. Six (14 per cent) of 44 breasts with intraductal papilloma seemed to have multiple gross papillomas in separate parts of the breast. There seemed to be no clear-cut correlation of any lesion with childbearing or nulliparity. The incidence of malignancy in this study was limited to one case. The patient was a woman 41 years old who had had radical mastectomy of the other breast for adenocarcinoma, Grade 3. The breast included in this study had no palpable mass but had had bloody discharge.

No malignant lesion was noted at the time this breast was removed, but in our present study we found a minute focus of comedocarcinoma, Grade 2.

Treatment for the breast having a mass and discharge from the nipple, we believe, should consist of biopsy of the mass with measures based on the findings. In the absence of a mass, local excision of the offending duct should be performed if possible. Otherwise, careful follow up is indicated, especially when the discharge is bloody.

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