

NIPPLE DISCHARGE

A CLINICOPATHOLOGIC STUDY

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THIS report is based upon a study of 67 patients, who had a discharge from the nipple. All types of nipple discharge were included because our experience demonstrated the danger of focusing attention on bloody discharge only. The cases were found by reviewing records of all breast cases seen in the Tumor Clinics of the Massachusetts General Hospital and the Boston Dispensary. From May, 1925, to January, 1939, 69 cases, or 7.6 per cent of 898 patients seen in the Massachusetts General Hospital Tumor Clinic, had nipple discharge. From January, 1932, to December, 1938, 19 cases, or 12.4 per cent of 153 patients at the Boston Dispensary Tumor Clinic, had nipple discharge. Thus, 8.3 per cent of 1,051 patients coming to the two clinics had nipple discharge. Excluded from this series are patients with discharge from inverted nipples, and patients with Paget's disease in whom a discharge came from an ulcerated nipple. In only 67 cases of a total of 88 were the records and clinical data adequate to warrant their inclusion in this report.

In 52 instances, operation had been performed. Slides were reviewed in all but five of these cases. In 15 cases, either no surgery had been advised, or the proffered surgery had been refused, but all these patients were under observation for a period sufficient to justify inclusion. In several patients a positive diagnosis of carcinoma of the breast was established by the clinical course which subsequently progressed to a fatal termination. The composition of a series of patients with nipple discharge, who come to a Tumor Clinic, is not altogether representative, because a number of patients and doctors find their own solution to the problem, unless the discharge is bloody or a tumor is also present.

Discharge from the nipple may be discussed under three headings: (1) Frequency. (2) Type of discharge. (3) Etiology of discharge.

Frequency.—Some type of discharge from the nipple occurs in about 8 per cent of all mammary lesions. A sanguineous discharge occurred in 6 per cent of 5,118 patients coming to the Johns Hopkins Hospital because of a breast complaint.³⁰ Deaver and McFarland²¹ stated that 3 to 5 per cent of breast cancers are accompanied by a discharge. Geschickter²⁹ reported a bloody nipple discharge in 96 of 204 cases (47 per cent) of duct papilloma. In a series of chronic mastitis cases, MacCarthy and Mensing⁶¹ found that 6.6 per cent of 406 patients manifested a discharge from the nipple.

Type of Discharge.—Certain generalizations are valid. A sanguineous dis-

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charge should arouse more concern than a nonsanguineous one. When a duct papilloma is responsible, discharge is often serosanguineous. A dark, bloody discharge is commonly caused by a duct carcinoma. However, too much emphasis must not be placed on such correlation. It is particularly important to appreciate that the presence of a carcinoma cannot be excluded because the discharge is free of blood. Two forms of breast discharge have diagnostic significance: (1) A grumous, greenish yellow discharge is almost always due to stasis in dilated ducts. (2) A continuous, milky discharge, often bilateral, is galactorrhea. The incidence of various types of discharge in this study is shown in Table I.

TABLE I
INCIDENCE OF TYPES OF DISCHARGE

Bloody (including serosanguineous).....	36 (54%)
Serous.....	16 (22%)
Milky.....	5 (7%)
Watery.....	2 (3%)
Miscellaneous.....	8 (13%)

Etiology of Discharge.—The experience of a number of investigators has shown that the three most common causes of discharge from the breast are duct papilloma, carcinoma, and chronic cystic mastitis, in that order of frequency. If bloody discharge only is studied, slightly more than one-half of the cases are due to a benign lesion. The incidence of chronic mastitis, as the cause of a bloody discharge, ranges from 7 per cent (Adair) to 15 per cent (Geschickter). Since this report deals with all types of discharge, it is not surprising to find that chronic mastitis was the etiologic factor in 27 per cent of our cases.

Other conditions may be enumerated. Nonspecific infections of dilated ducts are often accompanied by nipple discharge. Clinical evidence suggests an endocrine factor in some cases, although Taylor⁸⁰ was unable to confirm this by laboratory studies on a large group of women. Rare causes are trauma, sarcoma, fibro-adenoma, luetic and tuberculous mastitis. Table II shows the causes of discharge in our 67 patients, eight of whom had bilateral discharge.

TABLE II
CAUSES OF NIPPLE DISCHARGE IN 67 PATIENTS

Carcinoma (excluding Paget's disease) ...	22 (33%)
Paget's disease.....	2 (3%)
Chronic cystic mastitis.....	18 (27%)
Duct papilloma.....	7 (10.5%)
Hormonal dysfunction.....	7 (10.5%)
Inflammatory cysts.....	3 (4%)
Fibrous mastitis.....	2 (3%)
Miscellaneous.....	6 (9%)
Total.....	67

In 15 patients not operated upon, only a clinical diagnosis was available. However, in any similar group, there will be a number of patients in whom no indication for surgery is apparent, yet reasonably accurate diagnoses may be made. This source of error was minimized by the exclusion from this report of 24 patients whose records were inadequate.

Pathology.—About 75 per cent of the cases of nipple discharge are due to three lesions: (1) Carcinoma; (2) papilloma; and (3) the proliferative phase of cystic disease of the breast (Schimmelbusch's disease or adenosis). The carcinomata associated with nipple discharge are often the more localized, slowly growing papillary or comedo types. The majority of papillary carcinomata are thought to represent a late development in preëxisting benign papillomata. Geschickter noted that about one-third of the comedo carcinomata in his series (106 cases) occurred "in breasts which were the seat of adenosis." It is our opinion that this phase of cystic disease of the breast is a precancerous lesion, as is the duct papilloma, but to a lesser degree.

A fairly well standardized attitude prevails toward abnormal discharge from other body orifices, particularly a bloody discharge. No such agreement exists with regard to nipple discharge, bloody or otherwise. It is the purpose of this communication to stress the importance of nipple discharge as a sign which should make the observer search for an actual carcinoma or a precancerous lesion in the affected breast. In many cases, neither will be found, but only by such search is the patient's welfare adequately safeguarded.

Duct papilloma is widely acknowledged to have a potentiality for carcinomatous degeneration. Controversy centers upon chronic cystic mastitis and especially the actively proliferating lesions characterized by epithelial overgrowth in dilated ducts and small cysts (Schimmelbusch's disease, adenosis of Lewis and Geschickter,⁵⁶ cystipherous desquamative epithelial hyperplasia of Cheatle and Cutler)¹⁴ (Fig. 1). In the literature, there is scant attention given to this lesion as a cause of discharge from the nipple. Auchincloss³ stated that unexplained nipple discharge occurs most often from breasts containing cysts with epithelial proliferation. He added that this is the group of benign breast lesions most commonly associated with cancer. Geschickter reported that 47 of 211 benign cases of bloody nipple discharge were due to this lesion. Robles and Banno⁷³ declared that it was the most frequent type of benign lesion associated with bleeding from the nipple.

The consensus of present opinion holds that cystic disease, in general, is not a precancerous state. However, there is accumulating an increasing volume of evidence to suggest that cystic disease with epithelial hyperplasia is precancerous, although the supervention of malignancy may occur less frequently than is the case with the papilloma. In Warren's⁸⁴ recent study in which he concludes that chronic cystic mastitis predisposes to the development of breast cancer, he stresses the importance of this epithelial hyperplasia. Such cases comprise about 14 per cent of all cases of cystic disease of the breast, according to Lewis and Geschickter,⁵⁸ and 9 to 12 per cent of them show nipple bleeding.

In our series, 13 women were proven, histologically, to have chronic cystic mastitis. Ten of the specimens were associated with epithelial hyperplasia. Four of our patients were over 55 years of age. The slides from these four cases were shown to four Boston pathologists, all of whom regarded the lesion as precancerous. Moreover, histologic study of the 22 breast cancers with

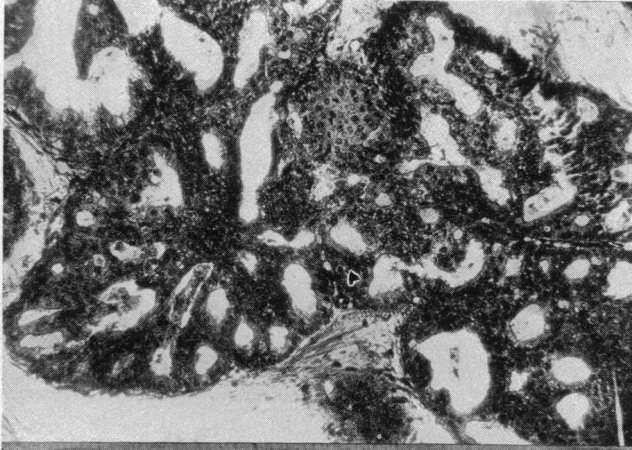


FIG. 1.—Case G. T. (M.G.H. East Surgical, No. 332503): Section shows the proliferative phase of chronic cystic mastitis (Schimmelbusch's disease or adenosis). This breast contained many small cysts. Note the benign papillary hyperplasia. The patient was 55 years of age. Pathologists to four large Boston hospitals were unanimous in regarding this lesion as precancerous. (X180)

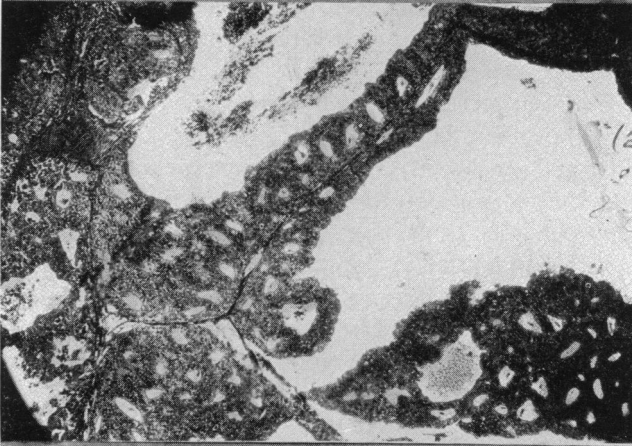


FIG. 2.—Case M. M. (B. D., No. 228908): Section showing dilated ducts lined by hyperplastic epithelium. This is Schimmelbusch's disease. In the same area of the breast, there was also a metastasizing adenocarcinoma, which could not be felt prior to operation. (X180)

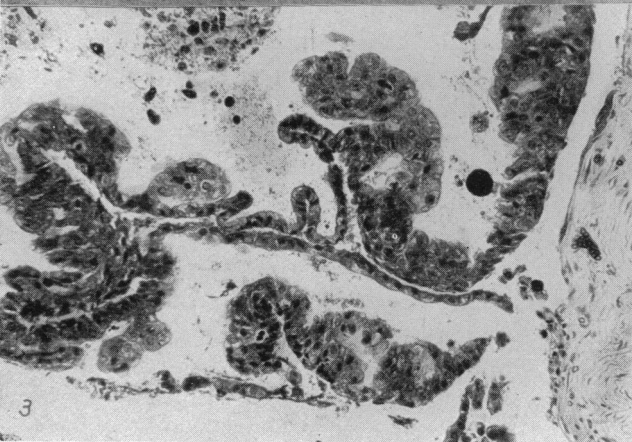


FIG. 3.—Case B. E. (B. D., No. 346749): This patient was 65 years old. This section was diagnosed as chronic cystic mastitis with marked intraductal epithelial hyperplasia. In the opinion of Dr. Shields Warren, pathologist, this lesion was definitely precancerous. A simple mastectomy was performed. (X240)

nipple discharge revealed that in six cases there was a marked degree of similar epithelial hyperplasia within the ducts, located in the same sector of the breast, in which the invasive, neoplastic epithelium had been found. In two of the six, the diagnosis of comedo carcinoma was warranted. In two other cases, the pathologist had already commented upon the presence of the Schimmelbusch type of proliferating epithelium seen in the same slide in which the carcinoma was present. Cheatle¹⁴ argues that this more than occasional co-existence of Schimmelbusch's disease and carcinoma is not mere coincidence. Warren's careful appraisal of their relationship led him to believe that the former condition predisposed to the latter. Geschickter,²⁹ who has been a strong advocate of the benignancy of chronic cystic mastitis, recently acknowledged that about one-third of the comedo carcinomata in his series occurred in breasts which were the seat of adenosis. The study of our clinical and histologic material has aroused the conviction that this epithelial overgrowth has a potentiality for malignant degeneration.

In an analysis of the 67 patients considered in the present study they were divided into eight groups according to etiology. These groups will be discussed in order of their frequency.

Carcinoma.—Twenty-four of 742 cancers of the breast (3.2 per cent) were accompanied by some form of discharge from the nipple. Two of these were Paget's disease. The average age was 50 years. Ten of the remaining 22 women had a bloody discharge, while 12 had a nonsanguineous discharge. In five cases the discharge was regarded as incidental, usually because it was very slight in amount and appeared long after the obvious tumor. In 17 cases the discharge was significant. A study of these 17 women is profitable. In a number of instances, the correct diagnosis was not established until long after the onset of the discharge. Four common sources of diagnostic error were apparent: (1) The youth of the patient; (2) the fact that the discharge was not bloody; (3) the discharge was the first symptom; and (4) the absence of a palpable mass in the breast.

(1) Two young women, 32 and 26 years of age, had bloody nipple discharge, painful breasts, but no mass when first seen. In both, the affected breast was described as "shotty," and in one patient this nodularity was localized in the upper, outer quadrant. Such localized nodularity Cutler¹⁷ proclaims as "a sign of great gravity," signifying the Schimmelbusch stage of chronic cystic mastitis. In one case three years elapsed before the discovery of an axillary metastasis brought about radical mastectomy, and the disclosure of an impalpable carcinoma (Fig. 2). This tumor was situated in an area of marked intraductal epithelial proliferation. In the second case, mastectomy performed one year later because of increasing nodularity demonstrated a comedo carcinoma with early invasion.

(2) There appears to have been undue emphasis on the bloody nature of nipple discharge. It is noteworthy that more than one-half the patients with cancer, in this study, had a discharge which was at no time bloody. Four women had a serious discharge. In three of them, a clinical diagnosis of

chronic cystic mastitis had been made despite the presence of a mass in the breast. This suggests that the absence of blood in the discharge persuaded observers that the lesion was benign.

Case Report.—M. G. H., East Surgical, No. 291743: G. L., female, age 25, who had been under treatment for pelvic inflammation, was found to have a discharge of thick serum coming from her right breast in which four separate nodular areas were present. A diagnosis of chronic cystic mastitis was made. Four months later she was first examined in the Tumor Clinic. Operation disclosed a rapidly growing cancer from which the patient died in two years.

(3) In 11 women, a discharge from the nipple had been the first indication of pathology in the breast. At their first Tumor Clinic visit seven of them also had a mass. The discharge preceded detection of a breast mass in these seven cases by an average of 12 months. Early cancer of the breast is more commonly associated with a discharge from the nipple than with any other sign except the presence of a lump. It is the first sign in about 1 per cent of all breast cancers.

(4) Four women had no palpable tumor in the breast when first examined. Three of them had a bloody discharge. All four breasts were abnormal, two showing localized nodularity in the upper outer quadrant, the other two presenting diffuse lumpiness. The four women had been observed for periods ranging from eight months to four years, before the diagnosis of cancer was established. Two young women received a small amount of roentgenotherapy to the breast, as suggested by Adair¹ in 1931. Discharge lessened but did not cease. In three of these four patients, the periodic clinic notes detail a steadily progressing process in the upper outer quadrant, with increasing confluence of nodularity, culminating in a demarcated area of induration which compelled biopsy. In the fourth case, no breast tumor was detected but an axillary metastasis required surgical intervention.

We concur with Wainwright's⁸³ dictum that the entire breast should be removed in those cases of nipple bleeding wherein no localized focus is clinically demonstrable. The bleeding breast with no tumor must be suspected of harboring not only a papilloma or precancerous epithelial hyperplasia, but even an actual, impalpable carcinoma.

Chronic Cystic Mastitis.—There were 18 cases of chronic cystic mastitis. In five patients, the diagnosis was based upon clinical evidence only. The discharge was bloody in seven women, serosanguineous in four, serous in four, and three women had a milky, a greenish, and a brownish discharge, respectively. The average age was 44. The physical findings were variable. Only three cases conformed to the clinical picture of Schimmelbusch's disease (*i.e.*, localized nodularity). However, clinical detection of this menacing phase of cystic disease is unreliable. Ten women had intraductal papillary epithelial hyperplasia. The nipple discharge contained blood in nine of these ten.

Case Report.—B. D., Tumor Clinic, No. 2449: M. A., female, age 42, had had simple mastectomies at a three-year interval, because of bloody nipple discharge. Neither breast was abnormal to palpation. However, in one breast there was marked papillary

proliferation, whereas its mate contained only a few small, blue-domed cysts and increased connective tissue.

Whatever concessions one may make to the general proposition that cystic disease is not precancerous, marked epithelial growth in the breasts of elderly women must occasion alarm. Two women, 68 years of age, are illustrative.

Case 1.—B. D., No. 329407: E. C. had manifested nipple bleeding for six months. No tumor was palpable. A radical mastectomy was performed because of the pathologic report—intracanalicular papillary adenocarcinoma. However, a review of the slides shows a benign lesion consisting of papillomatous infoldings of hyperplastic epithelium, with normal cell detail, and no invasion.

Case 2.—B. D., No. 346749: B. E. had had a lump in the breast for five years, intermittent, yellowish discharge. There was a diffuse, indurated area lateral to the nipple. A clinical diagnosis of Schimmelbusch's disease was confirmed microscopically. It was the opinion of Dr. Shields Warren,⁸⁴ who has recently published a study of this problem, that the lesion was to be regarded as precancerous, not only with respect to comedo carcinoma, but also to ordinary infiltrating carcinoma (Fig. 3).

The conclusion seems warranted that in cases of nipple discharge associated with a nodular breast, particularly if the discharge contains blood, the majority of such breasts will show epithelial hyperplasia. The disposition of this group will depend upon the surgeon's attitude toward the life history of such epithelial activity.

Duct Papilloma.—Seven duct papillomata were found. In the literature, papilloma and carcinoma have an equal rôle in accounting for about 90 per cent of the cases of bloody nipple discharge. The papillomata are located in the larger ducts, often under the areola. They are often bilateral and are multiple in the same breast in about 30 per cent of the cases. A nipple discharge, usually serosanguineous, occurs in 50 per cent. The lesion is frequently impalpable but may be detected by transillumination, if bleeding has occurred, as the blood delineates the papilloma. Sometimes the diagnosis can be made by detecting a small area of thickening under the areola, pressure on which evokes the nipple discharge.

Adair has estimated that the supervention of carcinoma requires 10 to 12 years. By that time a palpable mass is almost always present. However, there have been a number of cases in which the malignant transformation had occurred, yet the only evidence of its presence was the discharge from the nipple, Bloodgood, who has said that a woman with nipple discharge and no tumor runs no more risk of cancer than a woman who has neither, nevertheless sought for and removed papillomata even although impalpable.

Two of our seven patients had a nonsanguineous discharge. Six simple mastectomies were performed, but frequently the lesion can be removed by local excision. In a seventh patient, the diagnosis was made by transillumination. On microscopic study, the diagnosis of a benign lesion is occasionally difficult.

Case Report.—M. G. H., East Surgical, No. 298127: M. A., female, age 32, had had occasional slight bleeding from left nipple for 12 years. Examination showed a small,

hard mass underneath and adherent to the areola. The original pathologic diagnosis was papillary adenocarcinoma of low malignancy. However, current review of the sections demonstrates that the lesion is benign (Fig. 4).

In the 22 breast carcinomata in this study, there were three in which the clinical evidence and pathologic appearance suggest their origin in a pre-existing benign papilloma (Fig. 5).

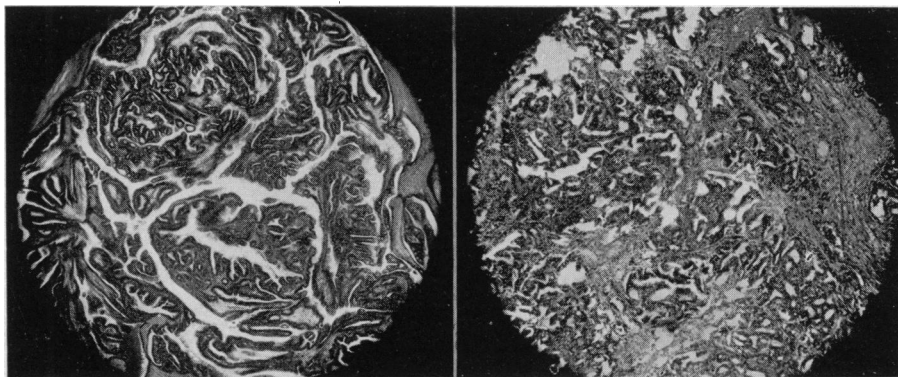


FIG. 4.—Case M. A. (M. G. H., East Surgical, No. 298127): Section shows a benign papilloma. There is no invasion, despite a 12-year history of nipple bleeding. (X120)

FIG. 5.—Case L. M. (M. G. H., West Surgical, No. 281571): A papillary adenocarcinoma with nipple discharge and a mass underlying the nipple. (X120)

Discharge from Hormonal Dysfunction.—The indications for inclusion of cases under this heading are not altogether satisfactory, since they rest on clinical grounds only. None of these seven patients was operated upon. There were no masses, cysts, nor areas of nodularity in any of these breasts. Three women had a milky discharge; three had a brownish or serosanguineous discharge; and one woman had a mucous discharge which ceased after the administration of ovarian extract. Mazer⁶³ and Lewis and Geschickter⁵⁶ have reported good results after estrogen therapy in a small group of women in whom breast bleeding occurred at the time of menopause. They postulate a lobular proliferation of epithelium (*i.e.*, adenosis) due to deranged hormonal physiology, and have clinical and experimental evidence in support. However, their therapy rests upon the clinical diagnosis of the morbid state in the mammary gland. In our experience, the clinical diagnosis in this age-group is not to be relied upon to this extent.

Nathanson⁶⁸ has demonstrated a definite relationship between galactorrhea and deficiency of the estrogenic hormone. The proliferative action of estrin on the epithelium of the cervix is well known. Our cases of galactorrhea warrant mention in this connection. The three women were multiparae, with badly lacerated, infected cervixes. Two of them were given large amounts of estrin over a period of months, during which time the galactorrhea ceased. In one woman, a small, infiltrating carcinoma of the cervix was discovered one year after treatment was started. In the second patient, a biopsy of the cervix, ten weeks after treatment, showed "some growth of epithelial cells

between the columnar epithelium, and the basement membrane" which was regarded as a possible precancerous focus. It is suggested that a conservative attitude toward the administration of large amounts of estrin for the correction of this breast discharge is perhaps wise, particularly if there is other pathology in the breast or cervix.

Paget's Disease of the Nipple.—It is of course recognized that Paget's disease will often be attended by a discharge from the surface of the ulcerated nipple. However, a number of investigators, including Jacobeus,⁴⁴ Dunn,²⁴ and Muir,⁶⁷ have advanced the proposition that a carcinoma of the large ducts precedes and eventually causes the characteristic nipple changes. In such an event, it is logical that the intraductal growth might manifest its presence by nipple discharge, prior to the appearance of the "pagetoid" changes in the nipple.

From a number of instances of Paget's disease, two cases were found in which a nipple discharge antedated any observed alteration in the nipple. The discharge was bloody in one case, and "watery-yellow" in the second. Lepper and Baker⁵⁹ reported a bloody discharge in 7 of 11 intraductal carcinomata. Geschickter describes 25 cases of duct cancer composed of large "pagetoid" cells, seven of which manifested nipple discharge in the absence of nipple ulceration.

Inflammatory Cysts.—A diagnosis of inflammatory cyst had been made on three specimens. The patients were 31, 40, and 48 years old, respectively. All three presented a circumscribed mass in the central portion of the breast for which they had been referred to the Tumor Clinic. In addition some type of nipple discharge, varying from bloody to milky, was also present. On pathologic examination, isolated chronic cysts with smooth lining were found. The cyst walls showed pronounced inflammatory changes.

Fibrous Mastitis.—Two breasts in this series, which were removed because of bloody discharge, showed histologically a pronounced increase in breast stroma accompanied by apparent atrophy of the epithelial elements. A female, age 33, gave a history of breast pain for one year, and bloody nipple discharge for four months. Clinically, her breast was unremarkable. On section, it was dense, leathery, and firm. There were no cysts. Microscopically, a profound fibrous mastitis, with atrophy of epithelial structures, was seen.

A female, age 71, had had a milky nipple discharge, followed by a reddish-brown discharge for eight months. Her breast was small, firm, and the nipple was hard and inverted. Sections, studied microscopically, were comparable to the above case.

The elderly patient should probably be classified as an example of senile involution. A precocious involution may also be responsible for the changes in the breast of the younger woman. Chronic interstitial mastitis, which Ewing²⁶ describes as a variant of chronic mastitis, is not usually marked by this degree of epithelial atrophy.

It is of interest to note that the sign of nipple bleeding, so commonly asso-

ciated with hyperplastic epithelium, can also occur in a breast in which there is minimal epithelial activity.

Miscellaneous.—Under this heading are included six cases which have been under recent observation and in which the diagnosis has not been clearly established. With one exception, all of these patients are from 35 to 40 years of age. Three of them have had serosanguineous discharge, and three have had only a serous discharge. Two women in this group illustrate certain features of special interest:

Case 1.—B. D., No. 316809: H. M., female, age 36, had had a bloody discharge for three weeks. A minute mass could be felt just superior to the areolar margin. This mass had also been felt in another Tumor Clinic. Survey was urged but refused. Three months later the tumor was no longer present and no discharge had occurred.

It is probable that a bleeding duct papilloma was responsible. The tumor resulted from an accumulation of blood in a cystic dilatation of a duct. With cessation of bleeding, the small cysts collapsed. Fischer,²⁷ in 1931, cited an instance of a "phantom tumor of the breast" produced in this manner.

Case 2.—M. G. H., Unit No. 33065: M. S., female, age 17, had had bloody nipple discharge intermittently for one year, following trauma to the breast. On examination, the breast felt normal, and no discharge could be expressed. Transillumination was not carried out.

While trauma is a well-recognized cause of bloody nipple discharge the relationship is usually obvious—a hematoma is present, and bleeding ceases within two weeks after the trauma. Therefore, a number of authors lay stress upon repeated or continuous bleeding as opposed to a single, brief episode. Thus, it is improbable that trauma played a principal rôle in the last case (Case 2).

Diagnosis.—(A) Nature of the Discharge: A thick, inspissated discharge may come from inverted nipples. Microscopic examination is often necessary, in order to demonstrate the presence of blood, as Adair has emphasized, but is of no help in revealing the presence of malignant cells, according to Greenough.³⁴ The presence of blood is significant, but its absence cannot rule out a lesion dangerous to the patient. Diagnosis is practically established by the finding of a continuous milky, or a greenish yellow discharge, indicating respectively, galactorrhea or duct stasis.

(B) Source of Discharge: Three special diagnostic aids are employed for the detection of lesions associated with nipple discharge. The presence of a small lesion, such as a papilloma, is occasionally demonstrated by the positive pressure test, whereby pressure over a segment of the areola expresses the discharge from the nipple. Transillumination will distinguish between a solid tumor and a cyst containing clear fluid, and will often reveal impalpable papillomata which may be multiple. However, if the papilloma has not bled, it may escape detection, as the opacity seen on transillumination is usually due to the collection of blood around it. Recently, the value of contrast mammography has been acclaimed, especially by Hicken and his co-workers.⁴² Our experience with the method has been limited to a few cases. The serious

tissue reactions which several groups of investigators have reported following the use of thorotrast for mammography, plus the possibilities of diagnostic error, tend to minimize its value.

Treatment.—The group of patients in whom both tumor and discharge are present arouse no controversy. The presence of the mass is an indication for surgery, independent of discharge. However, a bloody discharge should not stampede the surgeon into performing a radical mastectomy. In Hart's⁴⁰ series of 104 benign, intracystic papillomata, a radical mastectomy had been performed in 38 per cent. On the other hand, Miller and Lewis⁶⁵ found 27 malignant lesions in 40 breast tumors associated with nipple bleeding. Frozen section diagnosis of lesions associated with nipple discharge is sometimes difficult, because early or uncommon types of cancer may be encountered for the diagnosis of which permanent sections may be necessary.

The troublesome and dangerous problem is the discharging breast which, on examination, contains no mass. DaCosta¹⁹ has said, "It is better that a woman lose her breast needlessly, than her life." One need offer no apology for performing many biopsies or even simple mastectomies in border-line cases wherein the clinical picture suggests the possibility of carcinoma, even though many such operations demonstrate a benign lesion. However, the psychic and cosmetic arguments against mastectomy are prominent in the minds of patients, and demand consideration. Three general alternatives present themselves.

(I) *Mastectomy.*—Cheatle¹² is a strong advocate of mastectomy when the discharge is bloody. Supporters of this policy argue that the undiscovered source of the discharge is probably a papilloma or Schimmelbusch's disease, both of which they regard as precancerous. Moreover, the first sign of an actual cancer may be nipple discharge.

(II) *Observation.*—Bloodgood⁵ has stated that bleeding *per se* never justifies complete removal of the breast. Adair's recommendations are conservative. He has given up irradiation for this group of cases and awaits the appearance of a tumor unless transillumination reveals a papilloma. Geschickter, and others treat adenosis with large doses of estrin. Nodularity and bleeding often disappear. In favor of a waiting policy are the facts that impalpable cancer is rare, and discharge, even though bloody, not infrequently ceases spontaneously. Moreover, many surgeons do not regard this proliferative phase of cystic disease as precancerous.

(III) *Local Excision or Mastectomy.*—To many women, the idea of a mastectomy is intolerable, and in many cases of nipple discharge it is a radical procedure. Local surgery may often supplant the less desirable alternatives of observation or mastectomy. There are five groups of patients with nipple discharge and no tumor, in which the indications for surgery are definite, in our opinion:

- (1) Nipple discharge with positive transillumination.
- (2) Nipple discharge with positive pressure test.
- (3) Nipple discharge with localized nodularity in the breast.
- (4) Nipple bleeding after the menopause.
- (5) Continued nipple bleeding of undetermined origin.

(1) *Nipple Discharge with Positive Transillumination.*—When transillumination demonstrates an area of opacity in one of the large ducts near the nipple, the probable diagnosis of papilloma may be made. Local excision of the offending duct is indicated. The ingenious suggestion of Babcock⁴ appears to be the most satisfactory procedure for identifying the diseased duct in the operative field. Noting the duct orifice in the nipple whence the discharge comes, he threads the duct over the blunt end of a fine needle. An incision is made at the areola margin and the duct is distinguished by tilting the inserted needle. Multiple opacities may be visualized. Block excision of a breast segment or mastectomy may be required, depending on the extent and distribution of the papillomatous lesions.

(2) *Nipple Discharge with Positive Pressure Test.*—Occasionally, palpation and transillumination are negative, but pressure over a constant area within or near the areolar zone produces the discharge. A recent clinic patient had had amber-colored nipple discharge for one year, bloody on one occasion. She was able to cause the discharge by drawing a finger tip across the areola toward the nipple, along a constant axis. The discharge came from only one duct orifice. Palpation and transillumination were negative. In our opinion, excision of this duct should be undertaken.

(3) *Nipple Bleeding with Localized Nodularity in the Breast.*—Not infrequently, bloody nipple discharge occurs in a woman about 40 years of age, whose breast, on palpation, manifests a localized area of nodularity commonly felt in the upper outer quadrant. The remainder of the breast may be normal, or there may be diffuse "shottiness" in which one area stands out more prominently than the rest. Histologically, such an area is apt to present the picture of epithelial overgrowth. Twice in our experience, this clinical appearance of a benign lesion has masked the presence of an actual carcinoma in this site. It is our conviction that a biopsy should be obtained in all such cases. If hyperplastic epithelium is found, either a quadrant excision or mastectomy is proper.

(4) *Nipple Bleeding after the Menopause.*—In this situation, the psychic and cosmetic arguments against mastectomy are so attenuated, and the threat of cancer so real, that it is safer to adopt an arbitrary policy and advise simple mastectomy, unless it is possible that some definite local lesion can be identified.

(5) *Continued Nipple Bleeding of Undetermined Origin.*—The entire breast should be removed in those cases of continued nipple bleeding (*i.e.*, one month or more) in which no localized source of the bleeding is apparent.

Further aid in individualizing patients with a breast discharge as to surgery versus observation may be secured by a consideration of the following factors: (1) The type of discharge; (2) the duration of the discharge; (3) the age of the patient; (4) a family history of cancer; (5) the size of the breast; (6) the psychology of the patient; and (7) the question of adequate follow-up, essential to a program of observation.

SUMMARY AND CONCLUSION

(1) Sixty-seven cases of nipple discharge are reported. The discharge contained blood in 35 instances.

(2) Three lesions were responsible for about three-quarters of the cases—carcinoma, chronic cystic mastitis, and papilloma. The papilloma is a precancerous condition. Chronic cystic mastitis, with epithelial hyperplasia, is also to be regarded as precancerous.

(3) Twenty-four women had cancer. Twelve of them had a nonsanguineous discharge. In 11 women, discharge was the first warning of any disease in the breast. Four women had no mass in the breast at the time of their first examination.

(4) Contrary to common experience, chronic cystic mastitis was encountered more than twice as often as papilloma.

(5) The chief problem in this study is the discharging breast in which no mass is palpable. Such a breast must be suspected of harboring not only the precancerous conditions of a papilloma or chronic cystic mastitis with epithelial hyperplasia, but even an actual cancer.

(6) Treatment consists of local surgery or mastectomy. Radiation therapy has not proven to be of value. A definite number of cases require not operation, but observation; the surgeon, however, should try to make this latter group as small as possible, by consideration of all possible surgical indications. In this manner, important cancer-preventive surgery can be performed and the surgeon will occasionally be rewarded by the discovery of an early, impalpable cancer.

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