PLASMA-CELL MASTITIS**REPORT OF A CASE WITH BILATERAL INVOLVEMENT**

BY

MAX CUTLER, M.D.*(From the Chicago Tumor Institute)*

Since plasma-cell mastitis was first described (Cheatle and Cutler, 1931) this peculiar inflammatory condition of the breast has become a subject of increasing interest. The fact that fewer than fifty cases are recorded in the literature under this title attests to the rarity of the disease. Its importance lies in its marked similarity to cancer. In fact, until recently radical mastectomy was almost invariably performed without biopsy because the clinical picture seemed so classical.

The purpose of this communication is to review the literature and report a case with bilateral involvement, an aspect which so far as I am aware has not been previously recorded.

Case Report

A married woman* aged 37, with two children, aged 5 and 7, was first seen on Oct. 28, 1932. Two weeks previously she felt a sudden pain in the right nipple accompanied by swelling and tenderness of the right breast. Three days later the swelling, pain, and tenderness diminished and the patient felt a mass in the centre of the breast.

Examination disclosed the breast to be considerably larger than the left, and the surface temperature was raised. In the centre was a firm solid movable mass about 8 cm. in diameter attached to the overlying skin. Several enlarged movable lymph nodes were present in the right axilla. The left breast seemed normal. A diagnosis of diffuse duct carcinoma was made and, because of the possibility of inflammatory carcinoma, pre-operative irradiation was given as follows: right breast, 16,000 mg.-hours with 4 g. of radium, filtration 1 mm. platinum, distance 6 cm. through a round portal 10 cm. in diameter—4,000 mg.-hours for four days. Right axilla, 12,000 mg.-hours with 4 g. of radium, filtration 1 mm. platinum, distance 10 cm. through a round portal 10 cm. in diameter—4,000 mg.-hours daily for three days. The last radiation treatment was given on Nov. 2, 1932. Several days after completion of treatment the tumour began to regress rapidly. The patient was scheduled for radical mastectomy on Nov. 8, 1932.

In consultation with Dr. Richter just before the operation I suggested that the clinical picture, especially the rapid regression under irradiation, raised doubts about the diagnosis, and it was decided to perform a biopsy. The residual mass was excised and showed no evidence of carcinoma. The gross character of the lesion was most unusual. There were several small soft semi-fluid yellowish foci having a xanthomatous appearance, and numerous dilated ducts which exuded a brownish creamy material. Microscopically, foci of lymphocytes and solid masses of plasma cells with occasional foreign-body giant cells were seen, but no signs of carcinoma. Simple mastectomy was performed with the same gross and microscopical findings.

On July 6, 1939, six years and eight months after removal of the right breast, the patient complained of pain, tenderness, and nodularity in the left breast which recurred periodically at monthly intervals. These episodes corresponded to the menstrual cycle, although menstruation had ceased some years before in connexion with a hysterectomy. The ovaries were not removed. Examination disclosed that the left breast was enlarged, tender, and the seat of diffuse nodularity. In July, 1946, Dr. Richter performed a local excision. The gross and microscopical features of the specimen were those of plasma-cell mastitis.

Comment

This case presents several interesting and unusual features—the involvement of the second breast almost seven years

after the first, the cyclic periodic increase and recession of symptoms, and the marked radiosensitivity of the lesion. The clinical and pathological picture which created a problem in diagnosis and treatment is best presented by the following notes I made on the morning of Nov. 8, 1932, the day of the first operation.

"Just before operation, in conversation with Dr. Richter, it was my opinion that there was some doubt about the presence of cancer, and I recommended local excision of the residual mass and frozen section. This was done. The gross character of the lesion was most peculiar, there being several areas of soft semi-fluid xanthomatous foci, also numerous dilated ducts exuding a brownish creamy material. There were no definite chalky streaks as one finds in carcinoma. Frozen sections failed to show definite evidence of carcinoma. Microscopical examination shows numerous foci of plasma cells and lymphocytes with occasional giant cells. It is my opinion that we are dealing with plasma-cell mastitis. It is interesting to note, on reviewing the history, that the condition started with acute symptoms consisting of sharp pain at night and that upon examination there was elevation of surface temperature over the breast. It is also important that the whole duration of this lesion was only two weeks. Furthermore, the very marked and rapid diminution in size of the mass following irradiation is more in favour of an inflammatory process. All the evidence favours a benign lesion."

Historical

In 1925 Ewing began to call attention to an unusual lesion of the breast which presented the gross and microscopical features of a curious inflammatory process. Almost without exception a radical operation had been performed under a clinical diagnosis of cancer. Because of the presence of solid masses of plasma cells beyond those seen in the usual inflammatory lesions, Ewing suggested the name "plasma-cell mastitis." I was associated with Ewing in the laboratory of the Memorial Hospital at the time and undertook to study the clinical picture associated with this condition; I found in the records of the Memorial Hospital only ten cases. The clinical features associated with this pathological state were so striking as to make it obvious that we were dealing with a more or less specific clinical and pathological entity. The results of this study were published by Cheatle and Cutler in 1931.

In 1933 Adair published a detailed study of the same cases and reached essentially similar conclusions. Adair suggested that the lesion may be precancerous and advised local excision as the best treatment. In the same year I reported the case of a woman aged 50 with the classical clinical signs of the disease (Cutler, 1933). Eight weeks after the onset a residual tumour mass was excised which showed the typical gross and microscopical features of plasma-cell mastitis. In 1939 Rodman and Ingleby reported a case which showed marked shock and toxæmia after radical breast amputation under an erroneous diagnosis of cancer. They consider that the presence of colostrum-like cells and fatty acid crystals suggests that the disease may be due to the action of enzymes causing a splitting of milk-like substances secreted under certain conditions in breasts of non-pregnant women. These studies, they think, point to the possibility that the products of milk disintegration may constitute the causative agent.

Cromar and Dockerty (1941) reported twenty-four cases seen over a period of thirty years in the Mayo Clinic. A clinical diagnosis of cancer had been made in seventeen of the cases. The low incidence of the disease was emphasized by these authors and by Harrington (twenty-four cases of plasma-cell mastitis among 12,000 breast cases). In 1943 Payne, Strauss, and Glasser reported two cases under the title of "mastitis obliterans" and presented their reasons for preferring this term to that of plasma-cell mastitis. The same year Lübschitz (1943) reported the case

*This patient was referred to me for consultation by Dr. H. M. Richter, through whose courtesy her case is reported.

of a patient who died in shock twenty-four hours after radical mastectomy. A biopsy had been erroneously interpreted as cancer, hence the radical operation. In 1944 Parsons, Henthorne, and Clark found five cases of plasma-cell mastitis among 1,500 breast specimens. Two of the cases are reported with clinical data. Gaston (1947) added three new cases. One patient had a bloody discharge from the nipple and in another there was a coexistent comedo-carcinoma with metastasis to axillary lymph nodes. Gaston suggests that while plasma-cell mastitis is usually benign the disease has malignant potentialities and can develop into either a comedo-carcinoma or a malignant plasmocytoma.

Related Conditions

In 1931 I searched the literature for references to acute and subacute inflammation of the non-lactating breast with the view of finding examples of plasma-cell mastitis reported under other titles. I found the case presented by Courtin (1900) before the Bordeaux Medical and Surgical Society in 1899. The patient was 50 years of age and the menopause had occurred four years previously. The tumour had been present for three months and showed most of the classical features of cancer. It was firm and fixed to the skin. The nipple was retracted and the axillary lymph nodes were enlarged. The tumour was, however, exquisitely tender, and the skin was reddened and warm. The treatment consisted of local hot applications. After four weeks the tumour had disappeared and there was no evidence of disease. In the discussion Coquet referred to a similar case which he had observed.

In 1932 Cohn and Bloodgood reported a series of cases of non-suppurative chronic lactation mastitis, some of recent origin, others occurring months or years after pregnancy. Microscopical study of the sections revealed signs of residual lactation in all the cases.

In 1909 Ingier described a low-grade inflammatory lesion of the breast under the term "mastitis obliterans." From a review of the case, however, it is clear that, although the microscopical features have some resemblance to plasma-cell mastitis, the clinical picture is totally different. Thus the patient developed an abscess in a lactating breast unlike plasma-cell mastitis. This clinical picture generally does not simulate mammary cancer.

In the case reported by Hoerz (1910) as mastitis obliterans a tumour mass developed following trauma. This too is not the clinical picture of plasma-cell mastitis, but rather of traumatic fat necrosis. In 1933 Schultz reviewed the earlier German cases and added a case of his own under the term "mastitis obliterans."

From an analysis of the published data it seems clear that some of the cases published as "mastitis obliterans," such as those of Ingier and of Hoerz, have no real similarity to plasma-cell mastitis, at least clinically, whereas others, such as those reported by Payne, Strauss, and Glasser, represent the same condition that we call plasma-cell mastitis.

The case published by C. W. Cutler (1934) is disquieting. His patient was a woman aged 49. Local excision was performed for a tumour of the left breast, and a microscopical diagnosis of plasma-cell mastitis was made. Nine months later a growth with a similar microscopical structure appeared in the right vocal cord, and subsequently similar lesions appeared in the sterno-clavicular joint, upper portion of left breast, and right antrum. The question arises whether this is a true example of plasma-cell mastitis or one of plasmocytoma. The question must be left open for the present, but the weight of evidence favours the latter diagnosis.

Certain conditions which have some similarity to plasma-cell mastitis and from which it must be distinguished are: lactation mastitis with or without abscess formation, traumatic fat necrosis, and plasmocytoma. Diffuse duct carcinoma, especially when associated with inflammatory signs, has already been noted.

Distinguishing Features

Clinical Features.—A breast which is not the seat of lactation may become acutely inflamed. The onset is sudden, with pain, tenderness, and redness of the skin. At first the whole breast is swollen and the axillary nodes are enlarged and tender. Usually there is some rise in temperature and sometimes there are chills. A creamy discharge from the nipple is not uncommon. The acute symptoms soon begin to subside, and as time progresses the process enters the second or subacute stage. In this interval the pain and tenderness diminish and the swelling of the breast decreases, leaving a diffuse nodularity. After a relatively short period the subacute signs disappear and the disease enters a chronic stage, which is generally prolonged. When all the acute and subacute signs of inflammation have disappeared there remains a discrete, hard, solid residual mass with attachment to the overlying skin and often retraction of the nipple. The axillary nodes are usually enlarged and firm. It is during the latter part of the subacute stage and more particularly during the third or chronic stage that the breast presents the classical clinical picture of mammary cancer, rendering a diagnosis of cancer almost imperative, and it is only by eliciting from the patient the details of the initial inflammatory phases of the disease that an error in diagnosis is avoided and the patient saved from a radical mastectomy.

Gross Features.—On cross-section one sees numerous dilated ducts and minute cysts which under pressure exude a thick creamy puriform material. The fat, fibrous tissue, and epithelial elements show a peculiar induration. The tissue has an unusual pinkish inflammatory appearance. There are radiating strands of dense translucent fibrous connective tissue. In some portions there may be soft semi-necrotic greyish areas and xanthomatoid foci, 1 to 3 mm. in diameter, often projecting from the cut surface. The induration and resistance of the tissues simulate carcinoma, but even in the most dense portions one fails to find the classical cicatricial tissues or chalky points that are characteristic of carcinoma. Furthermore, the process is diffuse and does not form a definable tumour that can be limited from the remainder of the breast.

Microscopical Features.—The affected portions of the breast exhibit an active acute and subacute exudative inflammation with numerous leucocytes, lymphocytes, and plasma cells. The process is diffuse and involves both the glandular and the interstitial tissues. The exudate is especially prominent around the ducts and acini, where the cellular reaction may consist almost exclusively of plasma cells. Foreign-body giant cells are often encountered in the centre of these foci. In some instances they are numerous and in others they are few or altogether absent. The dilated ducts are filled with and distended by desquamated epithelial debris. The epithelial cells undergo an intense hyperplasia, which may be so pronounced as to give rise to a suspicion of carcinoma. In the frozen section such areas can be very confusing and may lead to a diagnosis of carcinoma.

Diagnosis

The diagnosis is comparatively simple if the patient is examined during the first or acute stage. In the later stages, when the inflammatory signs have subsided, diagnosis is more difficult and errors are common. The most important

aid in differentiating this disease from cancer is to recognize the acute onset and subsequent clinical course. In plasma-cell mastitis the initial picture is that of an acute or subacute inflammation which appears suddenly and subsides rapidly. The process regresses steadily, whereas in carcinoma the process is reversed. The disease begins locally and extends progressively. A single examination is generally inadequate, for only by several examinations can one determine whether the disease is progressing or regressing. This is the most important single factor in the differential diagnosis.

Plasma-cell mastitis has to be distinguished from (a) inflammatory carcinoma, (b) diffuse duct carcinoma, and (c) traumatic mastitis. The initial stages of plasma-cell mastitis resemble inflammatory carcinoma; in the latter state, however, the carcinomatous invasion of the subdermal lymphatics gives rise to an irregular ridge-like thickening of the skin which is not present in plasma-cell mastitis. Diffuse duct carcinoma complicated by inflammation may simulate plasma-cell mastitis, but the disease process is diametrically opposite in the two conditions, one being steadily regressive, the other steadily progressive. Traumatic mastitis is differentiated by the history of trauma and the classical transillumination findings.

There are two pitfalls in the microscopical interpretation, and both apply specially to the examination of frozen sections, in which the fixation is generally inadequate. The intense epithelial hyperplasia often appears to have invaded structures outside normal boundaries. Paraffin sections of the same areas show that the masses of cells are actually confined within normal boundaries of ducts and acini, yet the picture can be so confusing that errors are sometimes made by the most expert. Another source of confusion is that the plasma cells may be so large and oedematous that in frozen sections they resemble anaplastic malignant epithelial cells.

Prognosis and Treatment

This curious unexplained inflammatory process tends to spontaneous regression and resolution, although a remnant often remains for a long time. The possibility that the disease may be precancerous has to be considered, but the clinical evidence is rather against this theory. I have observed one example which was suggestive of a relationship between plasma-cell mastitis and cancer. Adair points out that the time factor has to be considered, and it may well be that further observations will tend to establish a closer relationship between the two states.

The differential diagnosis between the early stages of plasma-cell mastitis and diffuse duct carcinoma with or without inflammatory signs is sometimes difficult. In order to avoid undue delay in establishing the diagnosis, it seems best to perform biopsy early. In former publications I was rather against biopsy during the early acute stage of the disease, but subsequent experience leads to the opinion that, generally speaking, less harm is done by a carefully performed but adequate biopsy than might be done by delaying a diagnosis of cancer. If the inflammatory process is definitely subsiding there would seem to be an advantage in postponing biopsy for a short period.

The safest treatment during the chronic stage, when the lesion is localized, is to remove the diseased area surgically. If most or all of the breast is involved and the inflammatory signs have disappeared simple mastectomy is indicated. During the acute and early subacute stages, the diagnosis having been established microscopically, irradiation should be given, with the reasonable expectation that the lesion will regress and become more localized. Surgical removal of the remnant can then be performed. The possibility that irradiation alone will suffice has to be considered, but until

more cases have been studied over long periods surgical removal, alone or combined with irradiation, constitutes the safest course to pursue.

Summary and Conclusions

Plasma-cell mastitis is a clinical pathological entity. It is a peculiar inflammatory condition of uncertain aetiology. Its practical importance lies in the fact that it simulates cancer so closely that in the past it has almost always been treated by radical mastectomy. Since the onset and the course of the disease are highly characteristic and unlike those of cancer, a distinction is generally not difficult if one keeps the possibility of this condition in mind and if one elicits a careful history in every case of suspected mammary cancer. As regards treatment, the safest course to pursue after establishing the diagnosis by adequate biopsy is surgical excision during the later stages, when the lesion is localized, and irradiation during the acute or subacute stages followed by conservative surgical excision of the remnant.

A case of plasma-cell mastitis with bilateral involvement is reported in which irradiation demonstrated the lesion to be highly radiosensitive. So far as I know, no example of bilateral involvement has hitherto been recorded under this title.

REFERENCES

- Adair, Frank E. (1933). *Arch. Surg.*, **26**, 735.
 Cheate, G. L., and Cutler, M. (1931). *Tumors of the Breast*, p. 298, Arnold, London.
 Cohn, L. C., and Bloodgood, J. C. (1932). *Amer. J. Cancer*, **16**, 487.
 Courtin (1900). *Bull. Mém. Soc. méd. chir. Bordeaux*, p. 292.
 Cromar, C. D. L., and Dockerty, M. B. (1941). *Proc. Mayo Clin.*, **16**, 775.
 Cutler, C. W. (1934). *Ann. Surg.*, **100**, 392.
 Cutler, M. (1933). *J. Amer. med. Ass.*, **101**, 1217.
 Gaston, E. A. (1947). *Surgery*, **21**, 208.
 Hoerz (1910). *Beitr. klin. Chir.*, **70**, 682.
 Ingier, Alexandra (1909). *Virchows Arch.*, **198**, 338.
 Lübschitz, K. (1943). *Acta radiol., Stockh.*, **24**, 403.
 Parsons, W. H., Henthorne, J. C., and Clark, R. L., jun. (1944). *Arch. Surg.*, **49**, 86.
 Payne, R. L., Strauss, A. F., and Glasser, R. D. (1943). *Surgery*, **14**, 719.
 Rodman, J. S., and Ingleby, H. (1939). *Ann. Surg.*, **109**, 921.
 Schultz, A. (1933). *Handbuch der Speziellen Pathologie*, VII, 2, 145. Julius Springer, Berlin.

TWO COMMON NON-MALIGNANT CONDITIONS OF THE BREAST

THE CLINICAL FEATURES OF CYSTIC DISEASE AND THE PAIN SYNDROME

BY

DAVID H. PATEY, M.S., F.R.C.S.

Surgeon, Middlesex Hospital

The clinician tends to divide pathological conditions of the breast into two big groups: a group composed of well-defined pathological entities such as abscess, fibro-adenoma, or carcinoma; and a vague, ill-defined group with varying and indefinite symptoms and signs which he tends to lump loosely together under some such title as chronic mastitis. Owing to confusion which sometimes exists about this latter group I have thought it worth while to describe the two common non-malignant conditions of the breast as I see them clinically. I have also reviewed the literature in broad perspective to show how some of the ideas on this group of disorders have arisen. I would like to support the plea of Cheate for the abolition of the term "chronic mastitis," which has lost almost all precision and value; its sole remaining virtue is that no one can agree on a term to replace it. Deaver and McFarland in 1918 were able to collect no fewer than 23 different terms, and many more have been added since. Rather than attempt to burden the literature with still further terminologies I have thought it