PATHOLOGIC BASIS OF DISEASE

Nipples

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W. B. SAUNDERS COMPANY
Philadelphia • London • Toronto

ductal and intraduct
to the phase of the men

iese cyclic changes, we
basic histology of the
squamous epithelium
and nipple extends only
nouths of the main lac
becomes transformed
columnar and double-
helium that lines the
s the ducts branch and
epithelium tends to be-
cells but, in the smaller
ven in the gland buds, a
cells (reserve and myo-
identified beneath the
epithelium. The intra-
connective tissue has a
pearance, and is, there-
hed from the surround-
stroma. During the late
rual cycle, considerable
ytes accumulate in the
interpretation of these
inflammatory disease,
id in pathologic breasts,
ous concept that cystic
an inflammatory condi-
iation chronic mastitis.
ow, it will be indicated
he normal cycle of pro-
ion underlie the devel-
ant entity, better known
the breast.

onset of pregnancy that
complete morphologic
onal activity. From each
true secretory glands
rape-like clusters. As a
t is converted into an al-
structure that, indeed,
e pancreas. As a con-
reversal of the usual
tionship so that, by the
breast is composed al-
ls separated by a rela-
stroma. The secretory
single layer of cuboidal
l trimester, begin to as-
Vacuoles of lipid mate-
e cells, and immediately
cretion of milk begins.
med prior to birth ac-
n of colostrum.
, the glands once again
ie ducts shrink, and the
shes remarkably. How-
ion to the stage of the
usually does not occur,

he increase of glandular parenchyma
as a permanent residual. With this
ation atrophy, the stromal connective
nce again proliferates to reconstitute, to
r or lesser extent, the former volume
breast. Inadequate stromal growth ac-
or the loss in consistency and volume
nvolutional breast.

h the menopause, the ducts and gland
rther atrophy with more shrinkage of
a- and interlobular stroma. The gland
ay almost totally disappear in the very
nd leave only ducts to create a morpho-
ttern that comes close to that of the
lowever, in most women, there is suf-
persistent estrogenic stimulation, possi-
lrenal origin, to maintain vestigial rem-
gland buds that differentiate even the
d female breast from the male breast.
ore closing the consideration of the
breast, mention should be made of the
e of maternal hormones on the neo-
reast. These may cause considerable
ation of the ductal epithelium and
tal connective tissue in the newborn.
ngly, it is not uncommon to find hyper-
nd swelling of the breasts in the post-
nfant. Sometimes the maternal hor-
of pregnancy cause abortive secretory
with the actual appearance of secretion
ipple. These changes are entirely nor-
should not be confused with inflam-
or tumor formation. As the levels of
ernal hormones fall in the infant after
hese breast changes promptly regress
usually gone by the second week of in-
e.

HOLOGY

ALE BREAST

esions of the breast are preponderantly
ed to the female. In the male, the breast
dimentary structure relatively insensitive
docrine influences and apparently resis-
neoplastic growth. In the female, on the
hand, the more complex breast struc-
the greater breast volume and the ex-
sensitivity to endocrine influences all
spose this organ to a number of patho-
conditions.

The breast is the most common site of de-
ment of cancer in the female and alone ac-
ts for about one-fifth of all malignancies
is sex. Notwithstanding this high inci-
dence, benign tumors and tumor-like conditions are more frequent than these malignant neoplasms.

It is obvious, then, that diseases of the female breast have great importance in clinical medicine. Therefore, the major portion of this chapter is devoted to exclusive consideration of the female breast. Only at the conclusion will brief reference be made to disorders of the male breast. The two disorders of the female breast that assume preponderant importance are cystic hyperplasia and carcinoma. Since both these entities give rise to masses or lumps in the breast, the entire consideration of the pathology of this organ should be oriented within the framework of: What lesions produce masses? What is the significance of the mass? May it be confused clinically with a carcinoma? Does the lesion have a tendency to become malignant?

CONGENITAL ANOMALIES

These anomalies run the gamut from congenital absence of the breasts to abnormal numbers of breasts, but as a group these entities are rare and of limited clinical significance.

Supernumerary Nipples or Breasts. These result from the persistence of epidermal thickenings along the line of the ventral ridges, referred to in the embryogenesis of this organ as the milk line. Development of these aberrant foci gives rise to the formation of nipples, or even rudimentary breast structures, along the milk line, both below the adult breast and above it in the anterior axillary fold. They are usually readily identified on clinical examination, and only rarely produce confusion with a skin or subcutaneous tumor. Rarely the disorders that affect the normally situated breast may arise in these heterotopic foci, and occasionally the cyclic changes of the menstrual cycle cause painful premenstrual enlargements of these supernumerary structures.

Accessory Breast Tissue. Extension of breast tissue into the anterior axillary fold or axilla has already been described as being so common that it hardly merits designation as an anomaly. However, these minor aberrations may be the site for the development of tumors or abnormal proliferative or cystic changes. The chief importance of such lesions lies in the fact that they may create masses which appear to be outside the breast and are, therefore, commonly misidentified as lesions of the axillary lymph nodes or even as metastases from an occult breast cancer.

Congenital Inversion of the Nipples. This occurs in many women, particularly those who

have large or pendulous breasts. The cause of this abnormality is obscure. It may be related to failure of normal elongation of the ducts and tension upon the nipple, made more apparent by the accumulation of large amounts of subcutaneous fat and enlargement of the breast. Commonly, this inversion is corrected during the growth activity of pregnancy, or it may sometimes be corrected by simple traction upon the nipples. Nipple inversion is of clinical significance, since it may frustrate attempts at nursing, and may also be confused with acquired retraction of the nipple, sometimes observed in mammary cancer and in inflammations of the breast.

INFLAMMATIONS

Inflammations of the breast are, on the whole, uncommon and consist of only a relatively few forms of acute and chronic disease. Of these, the most important is nonspecific acute mastitis, virtually confined to the lactating period. Breast abscesses are included under the heading of acute mastitis. The other forms of mastitis consist of tuberculosis, usually a complication of tuberculous mediastinal lymphadenitis; syphilis in the form of a chancre on the nipple or areola, or possibly a skin syphilid; and mammary duct ectasia or plasma cell mastitis, an entity of obscure etiology.

ACUTE MASTITIS AND BREAST ABSCESS

During the early weeks of nursing, the breast is rendered vulnerable to bacterial infection by the development of cracks and fissures in the nipples. The disease is not confined, however, to the postpartum state and may be predisposed to by eczema and other dermatologic conditions of the nipples. From this portal of entry, *Staphylococcus aureus* usually, or streptococci less commonly, invade the breast substance.

Usually the disease is unilateral. The staphylococcus tends to produce a focalized area of inflammation that may progress to the formation of single or multiple abscesses. The streptococcus tends to cause, as it does in all tissue, a diffuse spreading infection that eventually involves the entire organ. Both agents produce characteristic reddening, swelling, pain and increased consistency in the affected breast substance, commonly with considerable edema and thickening of the overlying skin. During this early stage, the inflammatory changes may consist largely of the collection of pus within the affected ducts accompanied by periductal neutrophilic infiltration with involvement of the gland buds and surrounding stroma. However, in the course of time, suppurative necrosis may destroy large, usually only focal, areas of breast substance. Surgical drainage may limit the spread of infection, but whatever its extent, the destroyed breast substance is replaced by fibrous scar as a permanent residual of the inflammatory process. Such scarring creates a localized area of increased consistency often accompanied by retraction of the skin or the nipple, changes that may later be mistaken for a neoplasm. The similarity to a breast tumor is further heightened by the inflammatory enlargement of the axillary nodes that drain the infection. The skin and nipple retraction usually regresses in time as the fibrous scar stretches. Only rarely are sufficient breast substance or main excretory ducts involved to seriously impair future secretory activity of the breast.

MAMMARY DUCT ECTASIA (COMEDOMASTITIS)

Mammary duct ectasia is the designation of choice given to the entity that is also called *plasma cell mastitis. It is an obscure entity characterized chiefly by dilatation of ducts, inspissation of breast secretion, and marked periductal and interstitial chronic inflammatory reaction in which lymphocytes and plasma cells are prominent.* This disease tends to occur in the fifth decade of life and is somewhat more common in women who have borne children. Its genesis is obscure and, as can be appreciated from the various designations applied to this condition, it is thought to be due possibly to inspissation of lipid debris, bacterial infection or virus infections. The inspissation of secretion within the ducts is a favored view.

Supporting this theory, about half the patients have some difficulty such as inverted nipples, difficulties in nursing their young or cracked nipples. The accumulated debris incites a sterile ductal inflammation followed by escape of the lipid material into the surrounding stroma with resultant, more widespread chronic inflammatory reaction to the new lipid material. According to this concept, both the terms mammary duct ectasia and comedomastitis are applicable (Haagensen, 1956) (Tice et al., 1948). On the other hand, it is considered by others as an inflammatory reaction to some bacterial, viral or other obscure agent and is thus designated as plasma cell mastitis.

But it should be pointed out that there is disagreement as to whether mammary duct ectasia and plasma cell mastitis are, indeed, identical entities. The majority hold the view

these lesions reflect one and create varying tissue pa
ue of the differing stages
which the lesions are examin

Anatomically, the conditi
single area of breast substan
one of the major excretory duc
area of induration, thickening
Rarely, however, the entire bre
all the ducts are involved, or th
be bilateral. Dilated, firm,
frequently palpable through th
more readily apparent on sectic
terial can be extruded from the
pressure. The interductal con
increased consistency and som
section, foci of yellow necrosi
nipple by the inflammatory sca
the similarity to malignancy.

On histologic examination,
tures are (1) duct dilatation, (
by inspissated secretion and v
ductal inflammation and (4) f
matous inflammation. The
filled by granular, necrotic, ac
cretion), which sometimes contai
principally lipid-laden macro
The lining epithelial cells of t

Figure 28–1. Mammary duc
e top is partially filled with lipic
he ductal epithelium is destroy
ssues infiltrated with leukocytes