

RECENT MODALITIES IN MANAGEMENT OF PAINFUL BREAST CONDITIONS

An Essay

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الحديث فى أمراض الثدي المصحوبة بالألام

رسالة

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INTRODUCTION

Breast pain includes any type of pain or discomfort that occurs in the breasts, including the nipples and areolas. It can affect women and men in any age group or population. It is the most common breast related complaint among women. It is a common symptom that may affect up to 70% of women in their lifetime.⁽¹⁾

It is most common in women aged 30–50 years.

Breast pain may be bilateral, unilateral or in part of one breast. The most common type is a cyclical pattern related to the hormonal changes of menses. The second most common pattern is noncyclical, which accounts for more than a fourth of women with breast pain.⁽²⁾

Most women described their pain as 'heavy, aching and tender,' and these descriptors were given significantly higher ratings by women with cyclical pain.

In women with non-cyclical pain, the overall pain severity was related to the size of the painful area, and the steadiness of the pain, and the affective components were more prominent than in women with cyclical mastalgia.⁽³⁾

Breast pain may be caused by a variety of diseases, disorders and conditions. Sometimes breast pain is caused by a

benign condition that is not generally harmful, such as pregnancy, mastitis, bacterial infection, breast abscess and other conditions that cause hormonal changes.

However, because breast pain and breast changes may indicate a serious condition, such as breast cancer, it is important to seek prompt medical care.⁽⁴⁾

For diagnosis of breast case a process called: triple assessment is used, physical examination (PE), mammography, fine needle aspiration cytology (FNAC) in the evaluation and characterization of palpable breast lump.⁽⁵⁾

Management of breast pain includes: life style and home remedies such as : using hot or cold compression, wearing a bra with extra support or a firm support bra fitted by a professional, wearing a sports bra during exercise and while sleeping (when breasts are more sensitive), decreasing fat and caffeine in diet. Relaxation therapy can help control the high levels of anxiety associated with severe breast pain. Dietary supplements, Vitamin (E) and prim rose oil may lessen breast pain symptoms and some doctors recommend vit E and primrose oil capsules.⁽⁶⁾

Management also includes elimination of the underlying cause or aggravating factor through medical and surgical treatment.

Medical treatment is achieved by: analgesics (acetaminophen or ibuprofen), antibiotics (for infections), some medication such as Danazol or Tamoxifen & reduction or stopping the dose of menopausal hormone therapy.⁽⁷⁾

Surgical treatment is indicated in painful breast conditions when a mass is found. Surgery is performed in cases of breast abscess drainage , large fibroadenoma , some cases of duct ectasia , painful breast tumors (most painful tumors do not usually indicate breast cancer) & inflammatory breast cancer (causes stabbing pains in the breast).⁽⁸⁾

AIM OF THE WORK

To spot light on the causes of breast pain and recent modalities in diagnosis and management.

DEVELOPMENT OF THE BREAST

Fetal Development

The human breast develops from a thickened ectodermal ridge (milk line), situated longitudinally along the anterior body wall from the groin to the axilla at about 6 weeks' gestation. Regression of the ridge occurs except for the pectoral region (2nd–6th rib), which forms the mammary gland. Supernumerary glands may develop anywhere along the ectodermal ridges, and in 2% to 6% of women, these glands either mature into mammary glands or remain as accessory nipples.⁽⁹⁾

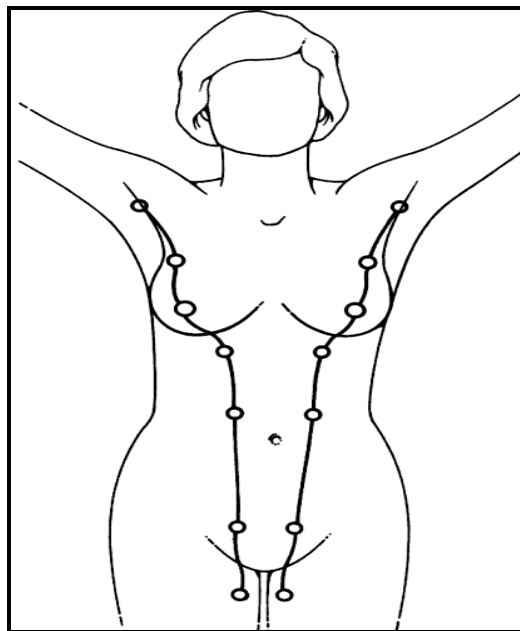


Fig. (1): The milk line. Mammary glands usually develop in humans from the pectoral portion of the line. Supernumerary mammary structures may develop from other positions along the line.⁽⁹⁾

During the 7th and 8th weeks of gestation, the mammary parenchyma invades the stroma, which appears as a raised portion called the mammary disc. Between the 10th and 12th weeks, epithelial buds form parenchymal branching occurs during the 13th through 20th weeks. Between the 12th and 16th weeks of gestation, the smooth musculature of the areola and nipple are formed, and at approximately 20 weeks' gestation, between 15 and 256 solid cords form in the subcutaneous tissue^(9,10).

Branching continues, and canalization of the cords occurs, forming the primary milk ducts by 32 weeks' gestation. At 32 weeks' gestation the ducts open onto the area, which develops into the nipple⁽¹¹⁾.

The adipose tissue of the mammary gland develops from connective tissue that has lost its capacity to form fibres, and it is considered necessary to further growth of the parenchyma. Shortly after birth, colostrum can be expressed from the infant's mammary glands. This is attributed to the pro-lactation hormones present in the fetal circulation at birth. Regression of the mammary gland usually occurs by 4th weeks postpartum and coincides with a decrease in the secretion of prolactin from the anterior pituitary gland of the infant⁽¹¹⁾.

Neonatal and Prepubertal Development

The ducts in the newborn breast are rudimentary and have small, club-like ends that regress soon after birth. Before puberty, the growth of the breast is isometric. Allometric growth of both the stroma and epithelium begins with the onset of puberty (8–12 years of age)^{.(12,13)}

Puberty

At puberty, the increase in breast size is mainly caused by the increased deposition of adipose tissue within the gland. However, progressive elongation and branching of the ducts creates a more extensive ductal network. The major site of growth is the bud-like structures at the end of the ducts, and these form the terminal duct lobular units or acini⁽¹⁴⁾.

Although knowledge of the hormonal regulation of mammary growth during puberty is not extensive, these maturational changes are associated with increased plasma concentrations of oestrogen, prolactin, luteinizing hormone, follicle stimulating hormone, and growth hormone⁽¹⁵⁾.

Developmental breast diseases:

- 1) **Polythelia** : Supernumerary nipples occasionally occur along a line corresponding to the position of the milk ridge. They are liable to be mistaken for moles.
- 2) **Retracted Nipple or Inverted Nipple** : Retracted nipple is a failure in the development of the nipple during its later stages. It is important clinically, because normal suckling of an infant cannot take place, and the nipple is prone to infection.
- 3) **Micromastia** : An excessively small breast on one side occasionally occurs, resulting from lack of development.
- 4) **Macromastia** : Diffuse hypertrophy of one or both breasts occasionally occurs at puberty in otherwise normal girls.
- 5) **Gynecomastia** : Unilateral or bilateral enlargement of the male breast occasionally occurs, usually at puberty. The cause is unknown, but the condition is probably related to some form of hormonal imbalance.⁽¹⁶⁾

Anatomy of the Breast

The breasts are specialized accessory glands of the skin that secrete milk. They are present in both sexes. In males and immature females, they are similar in structure. The breast tissue consists of a system of ducts embedded in connective tissue.⁽¹⁶⁾

The adult breast lies between the second and sixth ribs in the vertical plane and between the sternal edge medially and mid-axillary line laterally.

The average breast measures 10-12 cm in diameter, and thickness centrally is 5-7 cm. It is concentric with a lateral projection into the axilla, referred to as the axillary tail of Spence.⁽¹⁷⁾

The axillary tail of Spence is a prolongation of the outer part of the breast which passes up to the level of the third rib in the axilla. It gets into the axilla through an opening in the axillary fascia, known as **the foramen of Langer**. The upper outer quadrant is the most common site for the breast cancer and most benign breast pathologies. Nipple is usually situated at the level of the fourth intercostal space in men and nulliparous females but its position is inconstant when the breasts are pendulous.⁽¹⁸⁾

The adult breast consists of three major structures: skin, subcutaneous fatty tissue and breast tissue (parenchyma and stroma). The skin contains hair follicles, sebaceous glands and eccrine sweat glands.⁽¹⁷⁾

The glandular breast is divided into 15-20 segments (lobes) that converge at the nipple in a radial arrangement. These lobes are made up of 20-40 lobules. Each lobule in turn consists of 10-100 alveoli, collecting milk ducts, measuring approximately 2 mm in diameter, drain each segment. Between five to ten major collecting milk ducts open at the nipple into subareolar lactiferous sinuses, which are about 5-8 mm in diameter. Between the lobes of glandular tissue is subcutaneous connective tissue. Superficial pectoral fascia envelops the breast and is continuous with the superficial abdominal fascia of Camper. The undersurface of the breast lies on the deep pectoral fascia. Cooper suspensory ligaments provide support for the breast and are fibrous bands connecting the two fascial layers. The retromammary bursa refers to a distinct space on the posterior aspect of the breast between the deep layers of the superficial fascia of the breast and the deep investing fascia of the pectoralis major.⁽¹⁹⁾

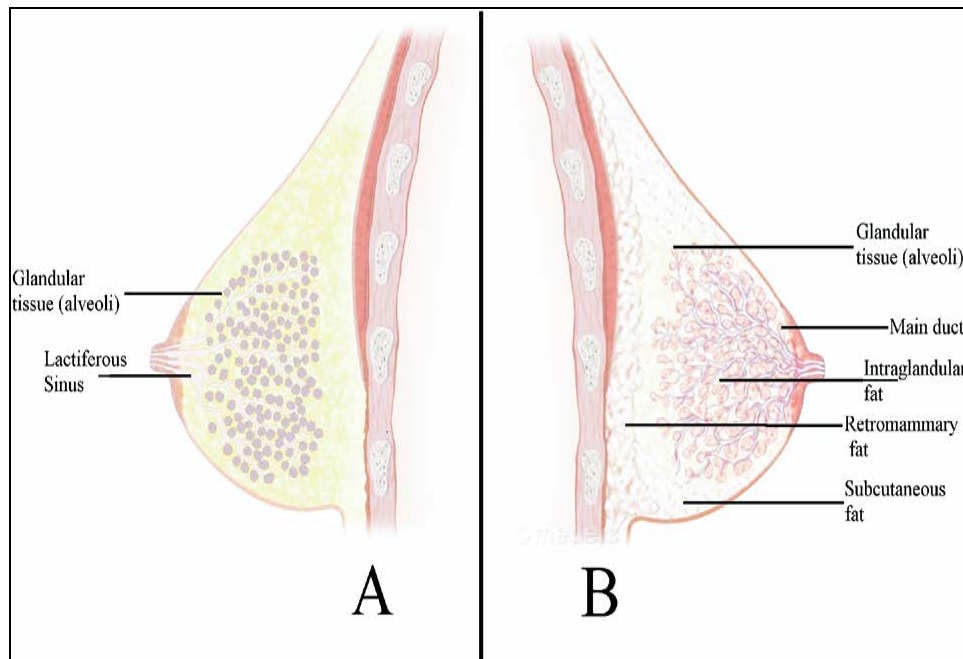


Fig. (2): A, schematic diagram of the anatomy of the breast. B, Schematic diagram of the ductal anatomy of breast.⁽¹⁹⁾

The nipple contains smooth muscle fibers arranged concentrically and longitudinally; thus, is an erectile structure which points outwards. The nipple is covered by thick skin with corrugations and near its apex lie the orifices of the lactiferous ducts. The areolar epithelium contains numerous sweat glands and sebaceous glands, the latter of which enlarge during pregnancy (**Montgomery tubercles**) and serve to lubricate the nipple during lactation.⁽²⁰⁾

Arterial supply:

The breast is supplied by branches of the axillary, internal thoracic, & 2nd to 4th intercostal arteries. The axillary artery supplies blood from several branches namely the superior thoracic, pectoral branches of thoraco-acromial artery, subscapular and the lateral thoracic arteries. The internal thoracic artery supplies perforating branches to the antero-medial part of the breast. The 2nd to 4th anterior intercostal arteries supply perforating branches more laterally in the anterior thorax. **(Figure 3)**. The second perforating artery is usually the largest and supplies the upper region of the breast, nipple & areola.⁽²¹⁾

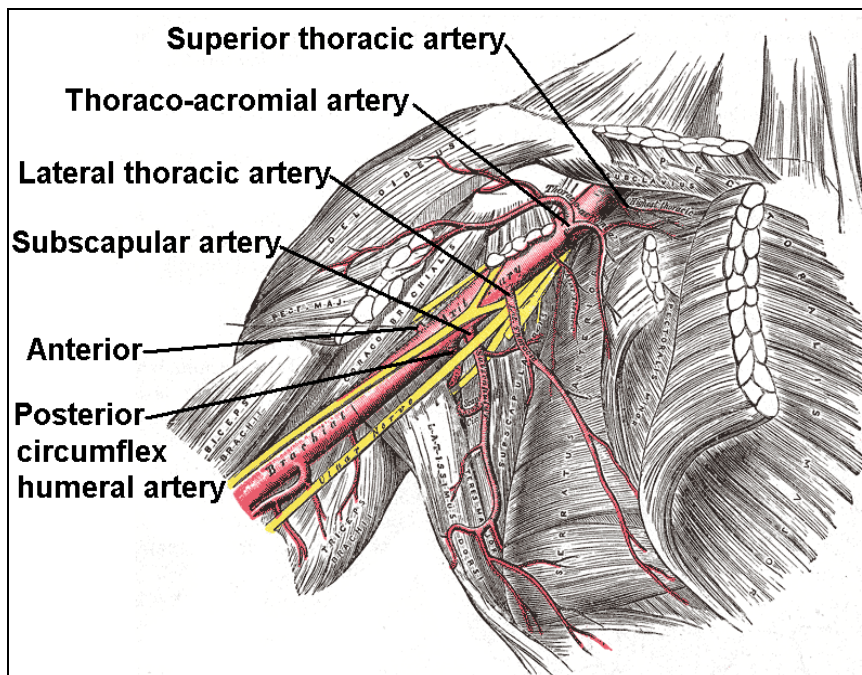


Fig. (3): Blood supply of the breast.⁽²²⁾

Venous drainage:

The venous drainage of the breast is divided into the deep and superficial systems which are joined by short connecting veins. Both systems drain into the internal thoracic, axillary, and cephalic veins. The deep veins are assumed to follow the corresponding mammary arteries, while the superficial plexus consists of subareolar veins that arise radially from the nipple and drain into the periareolar vein, which circles the nipple and connects the superficial and deep plexus. Symmetry of the superficial venous plexus is not apparent.^(23,24)

Innervation:

Cooper showed that the 2nd to 6th intercostal nerves supply the breast. The distribution and course of these nerves are complex and variable. The anterior nerves take a superficial course in the subcutaneous tissues, while the lateral nerves travel a deep course through the breast. The nipple and areola are supplied by the anterior and lateral cutaneous branches of the 3rd to 5th intercostals nerves most commonly the 4th intercostal nerve.⁽²⁵⁾