Post mastectomy complications

Essay

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CONTENTS

Introduction

The cornerstone of breast cancer management is surgical **(hynes *et al*.,2004)**. Surgical complications were graded as minor complications e.g. (seroma , hematoma and cellulitis) and major complications e.g. (organ failure and death) **(E-Arias.,2003) .**

Reported related local wound complications following modified radical mastectomy include seroma, flap necrosis , infection , hematoma and nerve injury **(Hall & Hall.,2004) .**

The mortality of breast surgical procedures is reportedly less than 1% **(hynes *et al*.,2004) .**

Complications , more frequently associated with general surgical procedures and prolonged hospital stays , such as cardiopulmonary and cerebrovascular accidents ,have infrequently been investigated in patients following breast surgery , albeit secondary to their rare occurance . The most frequently cited complications are related to wound infection and seroma formation **(Cochran *et al*.,1978).**

Seroma formation following mastectomy is a most common wound complication **(hynes *et al*.,2004)** .Seroma occurs in approximately 50% of patients undergoing modified radical mastectomy for breast cancer **(Kroll *et al*,1999) .**

Prolonged accumulation of post mastectomy seroma and repeated aspirations predisposes to sepsis , wound related complications and may delay adjuvant therapy **(Cochran *et al*.,1978) .**

The incidence of local recurrence after skin sparing mastectomy has been reported as 0-7% **(I.Tengrap *et al*.,2000) .**

Post mastectomy pain syndrome(PMPS) is a chronic pain condition , typically neuropathic pain in nature , which can occur following surgery to the breast **(Wood.,1978)** . The exact cause of PMPS is unclear , but varios aetiological theories have been postulated as damage to axillary nerve pathways **(Jung *et al*.,2003) .**

Breast cancer associated lymphedema of the upper extremity is the most commonly encountered problem . the most recent estimates suggest that , after axillary intervention , 20% to 30% breast cancer survivors will experience clinically relevant lymphedema **(Carpenter *et al*.,1998)** .Despite recent surgical and radiotherapeutic technical enhancements ,lymphedema remains problematic **(CJ.Moffat *et al*.,2000) .**

Although , mortality rate after mastectomy is low , the post mastectomy complications are still troublesome .

AIM OF THE WORK

The aim of this work is to spotlight the complications which may occur after mastectomy regarding methods of avoidance and management of these complications .

BREAST ANATOMY

The female breast extends from the 2nd rib above to the 6th rib below. It reaches the edge of the sternum medially and not beyond the midaxillary line laterally. It lies on the pectoralis major fascia superomedially and the serratus anterior fascia inferolaterally. It has an extension into the axilla called the axillary tail or (Tail of Spence) **(Aston *et al*., 1997).**

Breast Development:

I. Prenatal development :

Prenatal development is similar in both sexes, with epithelial mammary bud appearing at a gestational age of 35 days, by day 37 this has become a mammary line extending from axilla through to the inguinal region. Usually invagination of the thoracic mammary bud into mesenchyme occurs by day 49, with involution of remaining mammary line. Accessory breast tissue may be present in adult anywhere along milk line (polymazia). Nipple formation begins at day 56 and primitive ducts (mammary spronts) develop at 84 days with canalization occurring at about the 150th day **(Williams *et al*., 1995) .**

The absence of the testosterone hormone or its receptors allow female breast development to proceed. Conversely the presence of testosterone hormone in the male fetus induces rapid

mesenchymal proliferation and effectively, (Strangles) the epidermal spruts and obviates further breast development **(Georgiade., 1997) .**

II. Postnatal development:

Lobule formation occurs (exclusively in females) after puberty when there is branching of ducts and development of lobules from terminal ducts. Externally recognizable breast development from puberty onwards can be divided into 5 separate phases. In **phase1:** there is elevation of nipple. In **phase2:** glandular subareolar tissue is present with both nipple and breast projection from the chest wall as a single mass. **Phase3:** encompasses increase in diameter and pigmentation of the areola, with proliferation of palpable breast tissue. During **phase4:** there is further pigmentation and enlargement of the nipple and areola so that the nipple and areola form a secondary mass anterior to the main part of the breast. Finally, **phase5:** there is development of smooth contour of the breast **(Williams *et al*., 1995) .**

Female Breast Structure:

The breast made up of 15-20 lobules of glandular tissue embedded in fat and are separated by fibrous septae running from subcutaneous tissues to the fascia of the chest wall (The ligaments

of Cooper). Each lobule drains by its lactiferous duct on the nipple which is surrounded by areola **(Ellis., 2006).**

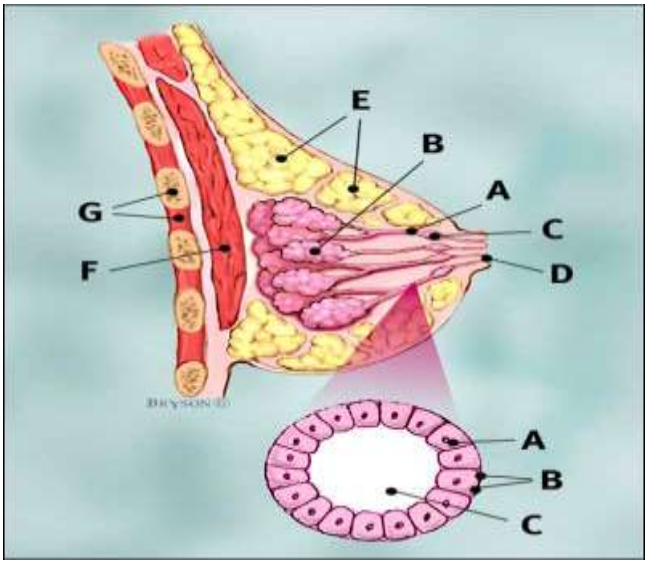

Fig . (1): Breast profile: **(Weiss *et al*.,2006) .**

A: ducts

B: lobules

C: dilated section of duct to hold milk

D: nipple

E: fat

F: pectoralis major muscle

G: chest wall/rib cage

Nipple areola complex (N A C):

The nipple is free of fat. It contains circular and longitudinal muscle fiber ,that erect or flatten it respectively. The areola is normally pigmented, and it is the circular area around the nipple. It contains apocrine sweat and sebaceous glands. The Tubercles of Morgagni are elevations at the gland openings. Montgomery glands are located at its periphery and are capable of secreting sebaceous secretion **(Romanes.,1993).**

Male Breast:

Male breast remains rudimentary throughout life. It is formed of small ducts (without lobules or alveoli) and a little supporting fibro-adipose tissue sometimes the ducts are largely solid cellular cords. Slight temporary enlargement may occur at puberty. The areola is well developed, although limited in area, and the nipple is relatively small **(Williams *et al*., 1995).**

Blood Supply Of The Breast:

I. Arterial supply:

Blood supply to the breast is from multiple sources:

1-The internal mammary artery: which arises from first part of subclavian artery, gives perforating branches (most notably the second to fifth perforators) supply the breast.

2-The thoracoacromial artery: it is a short branch of second part of the axillary artery.
3-The lateral thoracic artery: from second part of axillary artery.
4-The terminal branches of the third to eighth intercostal vessels and the vessels to serratus anterior.

N.B: The internal mammary vessels accounts for 60% of the total breast blood supply. The lateral thoracic supply contributes about 30% of total breast vascularity **(Jones., 2006) .**

The medial breast portion receives from the branches of the internal thoracic artery , especially in the 2nd and 3rd intercostal spaces. The lateral part is supplied by the lateral thoracic artery. Inferiorly, it is supplied by the anterior intercostal arteries, especially in the 4th and 5th intercostal spaces. The superior portion receives perforators of the supra-clavicular and the thoracoacromial arteries. These vessels anastomose below the NAC, then follow the connective tissue framework to penetrate the gland **(Corduff & Taylor., 2003)**

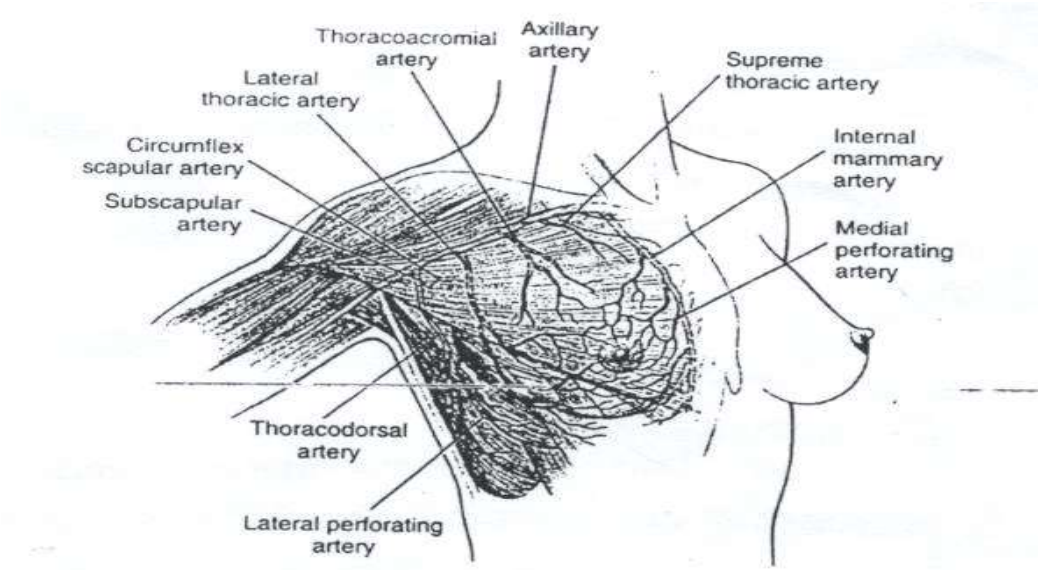

Fig.(2): Arterial supply of the pectoral region

(Sparatt *et al*.,2002) .

II. Venous drainage:

The venous drainage of the breast is divided into two systems the superficial and the deep system. The venous drainage of the breast is important not only because of the route of hematogenous metastatic spread from carcinomas, but also because of the lymphatic vessels generally follows the same course **(Haagensen., 1986) .**

1-The superficial venous system:

The superficial veins lies just deep to the superficial fascia . The superficial and deep veins anastomose with each other through the mammary gland and it may anastomose crossing the midline **(Herniques ., 1982) .**

2-The deep venous system:

Venous drainage is mainly by deep veins that run with the main arteries to internal thoracic, axillary, subclavian veins and azygous system via the intercostal veins. The posterior intercostal veins anastemosis with the vertebral veins provides an important link and hence a pathway for metastatic spread to the bone **(Mc Minn., 1994).**

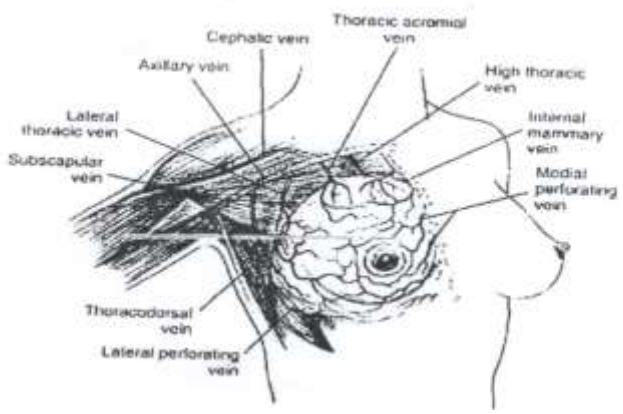

Fig: (3): Venous drainage of the breast **(Sparatt *et al*., 2002)**

III. Nerve supply to the breast:

The second to sixth intercostal nerves supply breast innervation. Lateral innervation is predominantly from the anterior rami of lateral cutaneous branches of the third through sixth intercostal nerves. Medial innervation arises from the anterior cutaneous branches of the second through sixth intercostal nerves. Nerve supply to the nipple is from the third, fourth, and fifth anterior and lateral cutaneous nerves. The fourth intercostal nerve is the most important nipple innervator **(Jones., 2006) .**

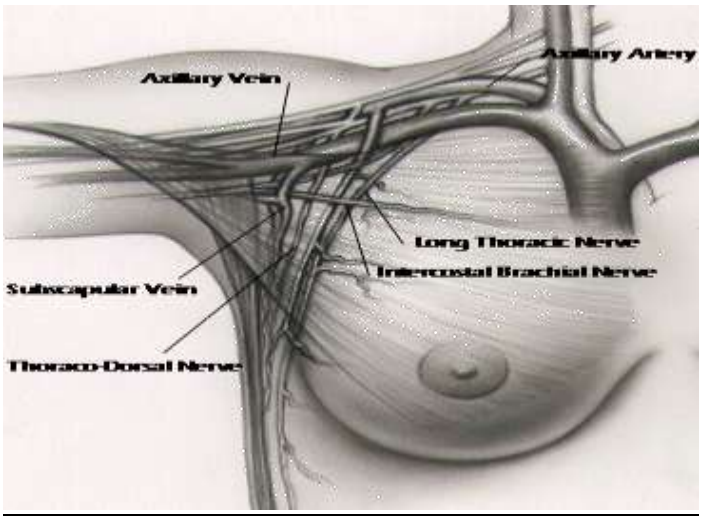

Fig: (4): Nerve supply of the breast **(Weiss *et al*.,2006).**