Evaluation of Huge Breast Reduction Mammaplasty, Comparative study with and without vertical scar

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Abstract

Different techniques were described for reduction mammaplasty aiming at restoring the aesthetic shape of the breast, lifting the nipple and the areola complex to the normal or ideal position and also reducing the size of the breast according to aesthetic ideals of the patient and the surgeon **.**

The shape of the scar was one of the most important issues in the technique of reduction mammaplasty in huge breasts ,and the most common scar was the inverted- T scar as in traditional McKissock technique .

New techniques were developed to improve the shape of the scar as the technique developed by Donald H. Lalonde (2003) to eliminate the vertical limb of the inverted T shaped scar.

In this study we will compare the 2 techniques regarding the aesthetic results and the rate of complications

Key Words :

Breast hypertrophy – Reduction mammaplasty – No Vertical scar .

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Introduction

The problem of breast hypertrophy is increasing worldwide especially in our part of the middle east, large breasts may be embarrassing , disabling , may cause pain in the neck and the back and affect the life style of the female and her productivity in the community.

The breasts and their sizes and shapes represent many things to the woman, what is desirable is determined by many factors including the culture and the social status of the female.

Physical problems attributed to excessively large breasts includes back, neck, shoulder pain, macerations and infection of the infra mammary regions, even neurologic complications caused by neck problems.

As in other pain syndromes, these conditions may lead to dysfunction and loss of productivity. The negative effect of sedentary life style is widely accepted, and therefore the potential for long-term disability and poor exercise tolerance should be recognized. ***(Raispis,et al 1995)***

The relief of the most common symptoms, chronic back pain, was confirmed by Strombeck .In this study 83% of patients with back pain had improvement of relief of their symptoms following reduction mammaplasty ***(Strombeck et al,1964).***

Major breast hypertrophy and gigantomastia were defined by Gsell as an excess of 1000cc-1500cc in volume in each breast **(Gsell,1974)**while Regnault and Daniel described major breast hypertrophy as an excess more than 500cc-1500cc per breast ,while they considered gigantomastia when the excess more than 1500cc ***(Regnault and Daniel,1989).***

Recent definition of gigantomastia is bilateral benign progressive breast enlargement to a degree that requires breast reduction surgery to remove more than 1800 g of tissue on each side. It is seen at puberty or during pregnancy. ***(Kulkarni et al 2006).***

Different techniques were described for reduction mammaplasty aiming at restoring the aesthetic shape of the breast, lifting the nipple and the areola complex to the normal or ideal position and also reducing the size of the breast according to aesthetic ideals of the patient and the surgeon ***(Arson,1976).***

The shape of the scar was one of the most important issues in the technique of reduction mammaplasty in huge breasts ,and the most common scar was the inverted- T scar as in traditional McKissock technique (1972).

New techniques were developed to improve the shape of the scar as the technique developed by Donald H. Lalonde (2003) to eliminate the vertical limb of the inverted T shaped scar.

In this study we will compare the 2 techniques regarding the aesthetic results and the rate of complications.

Embryology of the breast

The mammary glands are a distinguishing feature of mammals, and a primary symbol of femininity in man. It is the largest skin gland, as it is considered a modified sweat gland. It exists in both males and females, but in males, it remains in a rudimentary state throughout life. The development of the mammary gland begins early in embryologic life but ends only in the postpartum lactation in the adult female ***(Brilliants et al, 1989).***

During the fourth week of gestation, paired ectodermal thickenings called mammary ridges of milk lines develop on the ventral surface of the embryo, and extend in a curvilinear fashion convex towards the midline from the axilla to the mid thigh. This is the first morphologic evidence of mammary gland development. (Fig.l)

(Fig.l) Milk Lines (Gray's anatomy , 37th edition ,1989)

Later, the milk streaks atrophy with coalescence of cells in the cranial third of each ridge, forming what is known as the breast anlagen, which will determine the future position of the breast ***(Chatterton,1975).***

At the end of the 4th week of embryo development, the mammary gland begins to develop as a solid bud of epidermis into the underlying mesenchyme. This primary bud gives rise to several secondary buds that develop into lactiferous ducts and their branching then make up the mammary gland**.** (Fig.2)

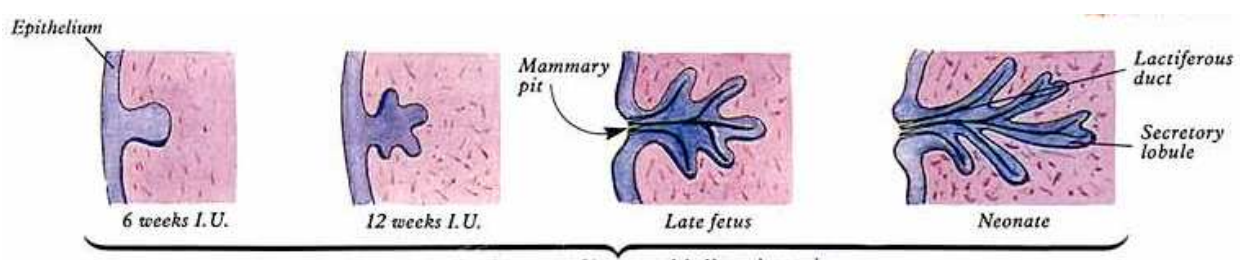


Fig.2 Early development of breast epithelium,in section,(Gray's anatomy 37th. Edition,1989)

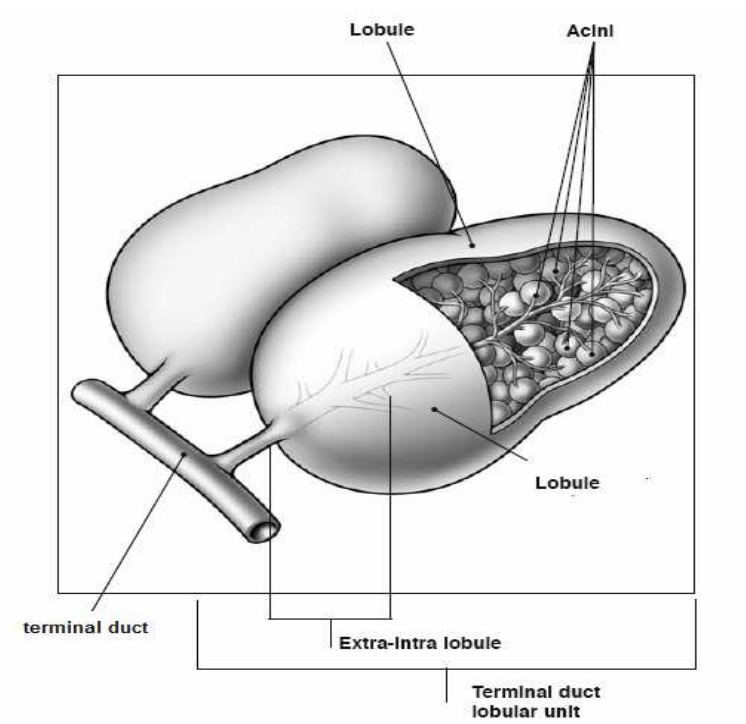
The developing breast is sensitive to the action of testosterone hormonal inhibition. The absence of testosterone in the female fetus allows female breast development to proceed.

Conversely, the presence of testosterone in the male fetus apparently induces rapid mesenchymal proliferation that effectively strangles the epidermal sprouts and obviates further breast development ***(Porter, 1974).***

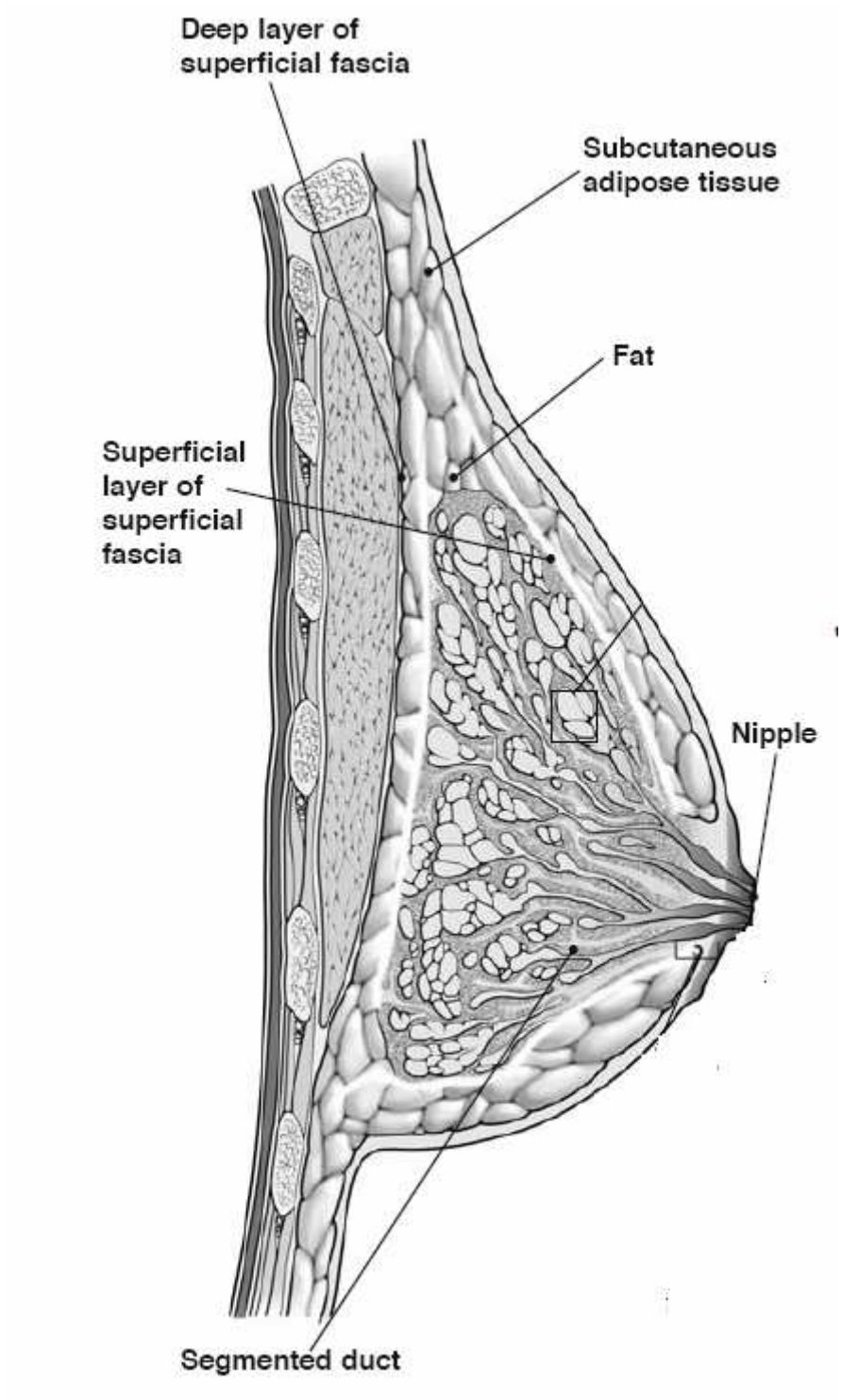
Ductal canalization and lengthening continues in the 20th to the 32nd weeks under the varying influences of estrogen, insulin, glucocorticoids and various epidermal growth factors ***(Going et al, 1988),*** From the 32nd to the 40th weeks, the milk ducts arborize into the normal lobular-alveolar pattern under the influence of progesterone, while estrogen, insulin, and the glucocorticoids assume a permissive role. The common end of the ducts elevates to form the nipple. The surrounding areolae, with the progenitors of the specialized lubricating glands

of Montgomery, are usually identifiable to the naked eye in the 20-week-old embryo ***(Elliott et al, 1983)*.**

The ductal system contains numerous lobules with acini. Each lobule feeds into a terminal duct, which, in turn, feeds into a segmental duct. The segmental ducts ultimately feed into collecting ducts, and about 15–20 of these converge under the areola on to the surface of the nipple through separate orifices***(Ismail Jatoi et al 2006)*** (.(fig 3a,b)



(Fig 3,a) Organization of the ductal-lobular system terminal duct lobular unit (Atlas of breast surgery Ismail Jatoi et al, 2006).



(Fig 3,b) Organization of the ductal-lobular system (Ismail Jatoi et al, 2006)

Physiology of the breast

The breast is a target for almost everybody hormone. Working alone, a hormone can exert direct influence, and, when several act in concert, they bring about a combined permissive effect. Through all stages of life, sexual maturation, the reproductive years, and the regressive decline of menopause- hormones, govern breast growth and function ***(Knobil et al, 1994).***

DEVELOPMENT OF THE BREAST:

Although breast development is under the influence of numerous hormones and growth factors secreted by the pituitary, adrenal, thyroid glands and the ovary remains the leading organ in regulating breast development. Ovarian function, in turn, is under high hypothalamic control ,ductal elongation and branching occurring during puberty are positively regulated by pituitary growth hormone, which acts through its local mediator, insulin like growth factor 1 (IGF-1).

Normal ductal development, however, requires the additional presence of estrogen and progesterone. The most dramatic changes in breast size and shape are observed at puberty, which, in girls, occur between the ages of 10 to 12 years with the approach of puberty, the rudimentary mammary gland begins to show growth activity, both in the glandular tissue and in the surrounding stroma.

Glandular enhancement is due to the growth and division of small bundles of primary and secondary ducts that in turn undergo further growth and division, ending in club-shaped terminal end buds. Cleavage of terminal end buds originates new branches and small ductules, or alveolar buds. Clustering of approximately 11 alveolar buds around terminal ducts constitutes the lobule type 1 (Lob 1) or virginal lobule.

The normal breast tissue of adult women contains two additional types of lobules, designated lobules type 2(Lob 2) and type three (Lob3) ***(Johnson and Everitt, 1995).***

Physiology of the breast

The architecture of the breast varies greatly in sexually mature women, depending on their parity history, age and menopausal status. The breast of nulliparous women contains more undifferentiated structures, such as terminal ducts and Lobe 1, with only occasional Lob 2 and Lob 3.

In parous women, on the other hand, the predominant structure is the most differentiated structures, Lob 3, the frequency of which peaks during the early reproductive years progressively decreasing in number after the fourth decade of life. It is interesting to note that a full-term pregnancy that occurs between the ages of 14 and 20 years increases significantly the number of Lob 3, which remains present as the predominant structure until a women reaches the age of 40 years.

Thereafter, and more markedly after menopause, their number decreases probably because of their involution and conversion predominantly to Lob 1 ***(Case and Waterhouse, 1994).***

After menopause, the breast undergoes regression, which is manifested as an increase in the number of Lob 1 and a concomitant decline in the number of Lob 2 and Lob 3 lobules. Although this regressive phenomenon is more marked in parous women, it also occurs in nulliparous women, and by the end of the fifth decade of life, the breast tissue is predominantly composed of Lob 1 ***(Ganong, 1999).***

Anatomy of the breast

A thorough knowledge of breast anatomy is critical for understanding the advantages and disadvantages of different techniques used for breast reduction, and it is therefore critical for selecting which techniques are best suited for certain patients. This knowledge is also essential for the safe execution of the selected method, minimizing vascular compromise, healing problems, and sensory changes, and maximizing preservation of function and long term stability of the postoperative shape.

The breast is suspended in the subcutaneous tissue on the anterior chest wall primarily overlying the pectoralis major fascia. On the sagital section are shown clusters of mammary lobules, connected by interposed fibrous tissues and blood vessels to form lobes. Each mammary lobe is composed microscopically of a collection of lobules comprising alveoli embedded in fat. (Fig.4)

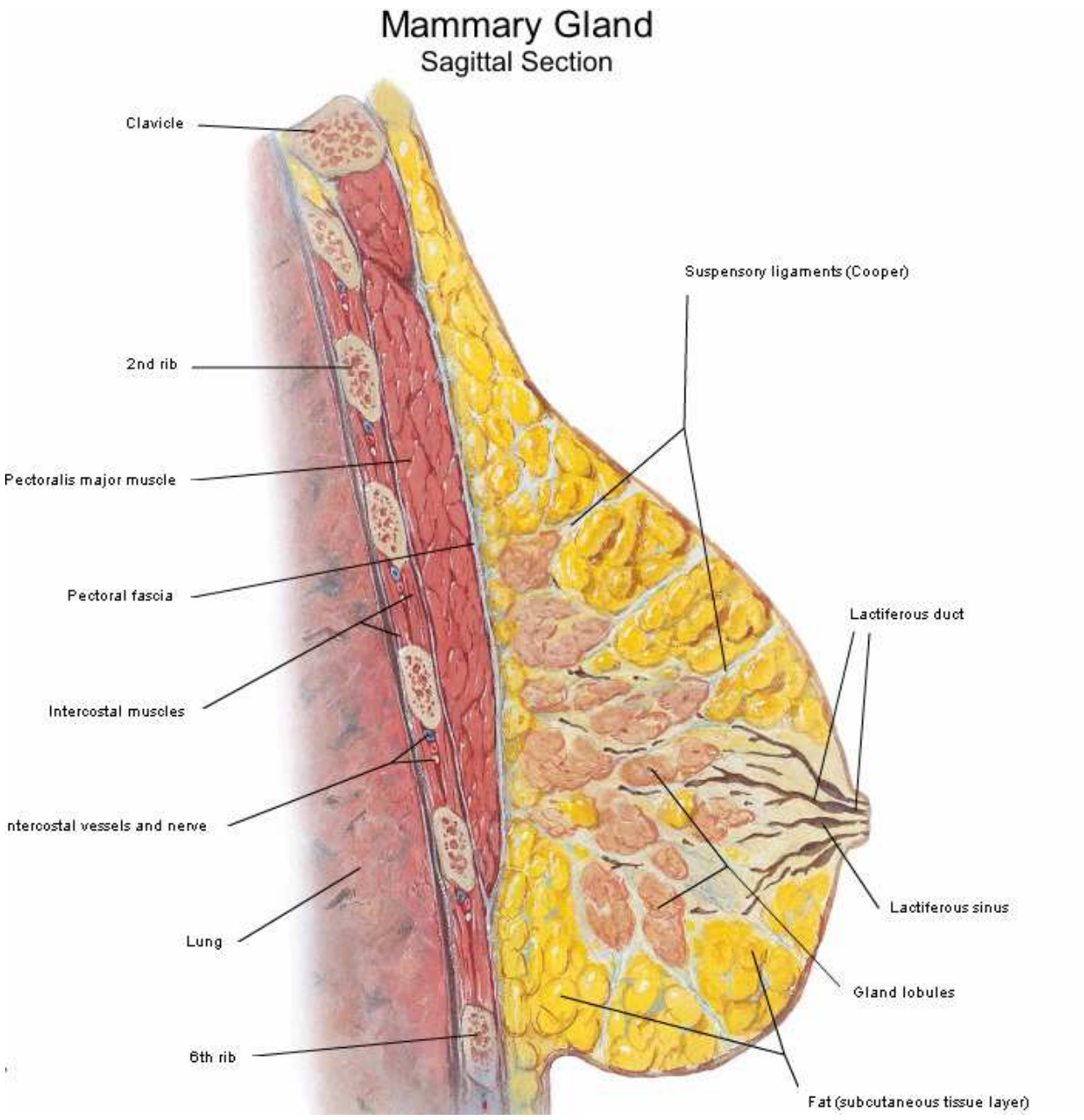
Structure of the Breast:

The mammary gland is a modified apocrine sweat gland that is contained within the cutaneous envelope of the breast. It consists of varying proportions of glandular tissue proper, connective tissue and adipose tissue that is different from one woman to another and at different stages of the reproductive period ***(Vorherr, 1974).***

a)Interglandular fat:

Its ectodermal embryologic origin implies that, the glandular tissue is intermingled with the subcutaneous adipose tissue. The adipose lobules are present in variable amount of the glandular tissue, the proportion varying with the degree of general obesity, age, pregnancy and lactation ***(Bricout, 1996).***

Connective tissue makes up a large portion of the mature mammary gland and its surrounding structures. It attaches lobes to fat deep within the breast, encloses each lobule with a collagen rich capsule, and provides a well-defined basement membrane surrounding each acinus and collecting duct**.**



(Fig.4)A longitudinal section of an adult Female Breast, Human atlas 3rd edition ,John t.Hanson ,2006).

At the anterior aspect of the gland, the connective tissue bundles extend into the subcutaneous adipose layer at right angles to the skin surface, and terminate in the dermis. These are the ligaments of Cooper. They fix the undersurface of the skin and the nipple to the breast. Posteriorly, the ligaments suspend the breast to the deep layer of the superficial fascia and to the pectoral fascia.