

Comparative study between the standard lumpectomy and other modalities of oncoplastic surgical techniques for the partial mastectomy

Essay

Submitted for Partial Fulfillment of Master Degree in General Surgery

By

Mehriban Mohammed Mohammed Amin

M.B., B.Ch.

Faculty of Medicine, Ain Shams University

Supervised By

Prof. DR. Fatin Anous

Professor of General Surgery

Faculty of Medicine, Ain Shams University

Prof. DR. Sameh Abdallah Maaty

Professor of General Surgery

Faculty of Medicine, Ain Shams University

Dr. Sherif Mourad

Lecturer of General Surgery Faculty of Medicine, Ain Shams University

2014

ACKNOWLEDGMENT

First and foremost, I feel always indebted to God, the kind and merciful.

*First I would like to express my gratitude and deepest thanks to **Prof. Dr Fatin Anous** professor of General surgery for giving me chance to perform this study in his unit.*

*Many thanks to **Prof. Dr. Sameh Abd Allah Maaty**, Professor of General surgery, for his support and review of this work.*

*Words are not enough to express my great thanks and deep appreciation to **Dr. Sherif Murad**, Lecturer of General surgery, for his effort, comments, ideas, constructive criticism and support throughout this study.*

I would also like to thank all my family & colleagues for their encouragement.

A very special thank to my Fiancé for his great help support and encouragement throughout this work.

List of contents

- I. List of tables*
- II. List of Figures*
- III. Introduction*
- IV. Aim of work*
- V. Review of literature*

- 1. Surgical anatomy of breast & axilla.*
- 2. Risk factors of breast cancer.*
- 3. Pathology of breast cancer.*
- 4. Diagnosis of breast cancer.*
- 5. Surgical treatment.*

Includes;

- 1. Wide local excision or simple mastectomy or lumpectomy.*
- 2. Other modalities of oncoplastic surgical techniques;*

- a. Parallelogram mastopexy lumpectomy*
- b. Batwing mastopexy lumpectomy*
- c. Donut Mastopexy Lumpectomy*
- d. The reduction mastopexy lumpectomy*
- e. Modified round block technique*
- f. Triangle Resection with Crescent Mastopexy*

- VI. Summary*
- VII. Conclusion*
- VIII. References*
- IX. Arabic summary*

List of tables

<i>No of table</i>	<i>page</i>
<i>Table 1: clinical and pathologic characteristics of LCIS and DCIS</i>	<i>44</i>
<i>Table 2: Classification of Breast Ductal Carcinoma In Situ (DCIS)</i>	<i>45</i>
<i>Table 3: TNM Staging System for Breast Cancer</i>	<i>51</i>
<i>Table 4: TNM Stage Groupings</i>	<i>56</i>
<i>Table 5: Pathologic Classification of Benign Breast Disease and the Risk Associated with Each Category</i>	<i>62</i>
<i>Table 6: Risk Factors for Breast Cancer</i>	<i>63</i>
<i>Table 7 : Oncoplastic decision guide</i>	<i>119</i>
<i>Table 8 : Level I OPS: step-by-step surgical approach</i>	<i>121</i>
<i>Table 9 : Level II OPS: quadrant per quadrant Atlas (orientation for left breast)</i>	<i>126</i>

<i>No of figure</i>	<i>Page</i>
<i>Fig.1: Human Embryology and Developmental Biology</i>	<i>13</i>
<i>Fig. 2: Development of the breast,</i>	<i>14</i>
<i>Fig. 3: Diagrammatic sagittal section through the nonlactating female breast and anterior thoracic wall.</i>	<i>17</i>
<i>Fig. 4 : Parasagittal section through the pectoral region.</i>	<i>19</i>
<i>Fig. 5 : Diagram of the walls of the axilla.</i>	<i>20</i>
<i>Fig. 6: Blood supply of the breast</i>	<i>23</i>
<i>Fig. 7: Lymph nodes of the breast and axilla. Classification of Haagensen.</i>	<i>25</i>
<i>Fig. 8: Lymphatic drainage of the breast</i>	<i>27</i>
<i>Fig. 9 : Diagram of lymphatic drainage of the breast.</i>	<i>30</i>
<i>Fig. 10: International variation in breast cancer incidence and mortality.</i>	<i>33</i>
<i>Fig. 11: Invasive ductal carcinoma with productive fibrosis</i>	<i>47</i>
<i>Fig.12: Medullary breast carcinoma.</i>	<i>48</i>
<i>Fig. 13: Lobular carcinoma.</i>	<i>50</i>
<i>Fig.14:Examination of the breast.</i>	<i>65</i>
<i>Fig.15 : Standard mammogram</i>	<i>69</i>

views.	
<i>Fig.16: A. Linear and branching calcifications typical of comedo type ductal carcinoma in situ.</i>	<i>71</i>
<i>Fig. 17: A-Standard mammography. B-Digital mammography of the same breast</i>	<i>72</i>
<i>Fig.18: Ultrasound image demonstrating a solid mass with irregular borders consistent with cancer.</i>	<i>75</i>
<i>Fig.19 : Magnetic resonance imaging</i>	<i>76</i>
<i>Fig.20: Fine needle aspiration</i>	<i>84</i>
<i>Fig. 21: DVAB or Mammotomy</i>	<i>86</i>
<i>Fig. 22: Comparison of different biopsy techniques.</i>	<i>90</i>
<i>Fig. 23: Modified radical mastectomy</i>	<i>98</i>
<i>Fig.24 : Breast Conserving Surgery</i>	<i>101</i>
<i>Figure 25- A, Breast ducts injected with colored wax</i>	<i>109</i>
<i>Fig 25-B, Three-dimensional computer modeling images of all ducts and branches in an autopsy breast</i>	<i>111</i>
<i>Figure 26. A, Bracketed multiwire localization of segment ally distributed ductal carcinoma.</i>	<i>114</i>
<i>B, Specimen radiograph of resected ductal carcinoma.</i>	

Surgical management of breast cancer

<i>Fig.27:a,b Level I OPS: nipple recentralization</i>	<i>124,125</i>
<i>Fig. 28: Level II OPS: superior pedicle mammoplasty for lower pole lesion</i>	<i>129</i>
<i>Fig. 29: Level II OPS: Vmammoplasty for lower inner quadrant</i>	<i>131</i>
<i>Fig. 30: Level II OPS: Inferior pedicle mammoplasty</i>	<i>130</i>
<i>Fig. 31: Level II OPS: round block technique for upper pole lesion</i>	<i>134</i>
<i>Fig. 32: Level II OPS: racquet technique for upper outer quadrant</i>	<i>136</i>
<i>Fig. 33: Level II OPS: J-mammoplasty for lower outer quadrant</i>	<i>137</i>
<i>Fig. 34 : axillary lymph node dissection.</i>	<i>141</i>
<i>Fig. 35: injections around the perimeter of the biopsy site with lymphatic drainage to the sentinel node.</i>	<i>145</i>
<i>Figure 36a-e: Parallelogram mastopexy operation</i>	<i>149-151</i>
<i>Figure 37 :Batwing mastopexy operation</i>	<i>153</i>
<i>Figure 38a-e Donut mastopexy operation</i>	<i>156-159</i>
<i>Figure39: The reduction mastopexy lumpectomy</i>	<i>162</i>
<i>Fig. 40-a-c :Steps of Modified round block technique</i>	<i>165</i>

***Fig. 41a-c:Steps of Modified
round block technique*** **168**

***Fig. 42a-c:Steps of Modified
round block technique*** **168**

FIG. 43: ‘Bird beak’ deformity **172**

***FIG. 44:Maintaining a
glandular dissection plane
perpendicular to the skin surface*** **173**

***FIG. 45: Retention of a
triangular area of skin at the
midpoint of the inframammary
skin fold*** **175**

Introduction

***This novel approach was first referred to as “oncoplastic surgery” by W. Audretsch in 1994.
(Audretsch et al.,1994)***

***Until recently, the term “oncoplastic surgery” had various meanings depending on the expertise and specialty training of the surgeon.
(Kronowitz SJ, et al.,2006)***

In the plastic surgery literature, oncoplastic surgery typically refers to large partial mastectomy combined with myocutaneous flap reconstruction, such as the Latissimus Dorsi flap or the Transverse Rectus Abdominis myocutaneous (TRAM) flap.

For breast conservation to be efficacious, the surgeon needs (1) to obtain complete excision of the cancer with adequate surgical margin width and (2) to achieve a surgical result that maintains the breast’s shape and appearance over time.

For larger cancers, it can be technically challenging to simultaneously address both of these goals in the same operation. Simple flap advancement “mastopexy” techniques developed by plastic surgeons for breast reduction can reshape the breast immediately after larger breast cancer resections.

By contrast, small- or intermediate-sized cancers can generally be managed nicely using simple oncoplastic techniques that facilitate wide excision of the cancer and preserve the shape and appearance of the breast.

In oncoplastic surgery, by advancing locally available fibroglandular tissue along the chest wall, the defect created by partial mastectomy is closed with a breast “fibroglandular flap,” called mastopexy closure.

(Lisa Jacobs, et al., 2011)

A circumferential incision was made without excision of the periareolar skin, and subcutaneous dissection was extended to the entire breast. The wound could be widened and moved onto the distant tumor by application of a wound retractor. Partial mastectomy was then performed under direct vision. The wound was easily closed without tension.

(Elsevier, et al. , 2013)

Resection of inferior pole breast cancers commonly produces inferior cosmetic results, particularly when resection of skin is required. The triangle resection with mastopexy is one of several oncoplastic breast surgical techniques that enable resection of inferior pole lesions with preservation if not improvement of breast cosmesis.

(Dennis R. Holmes, et al., 2012)

Multiple technically simple techniques have been described; Parallelogram mastopexy lumpectomy, Batwing mastopexy lumpectomy, Donut Mastopexy Lumpectomy, the reduction mastopexy lumpectomy

(Chin-Yau Chen, et al., 2011)

Surgical management of breast cancer

Also modified round block technique.

(Hisamitsu Zahaetal., 2013)

And triangle Resection with Crescent Mastopexy.

(Melvin J. Silverstein, etal., 2012)

AIM OF THE WORK

Is to compare between the standard lumpectomy and other modalities of oncoplastic surgical techniques for the partial mastectomy; Parallelogram mastopexy lumpectomy. Batwing mastopexy lumpectomy, Donut Mastopexy Lumpectomy, the reduction mastopexy lumpectomy, Triangle Resection with Crescent Mastopexy, Modified round block technique.

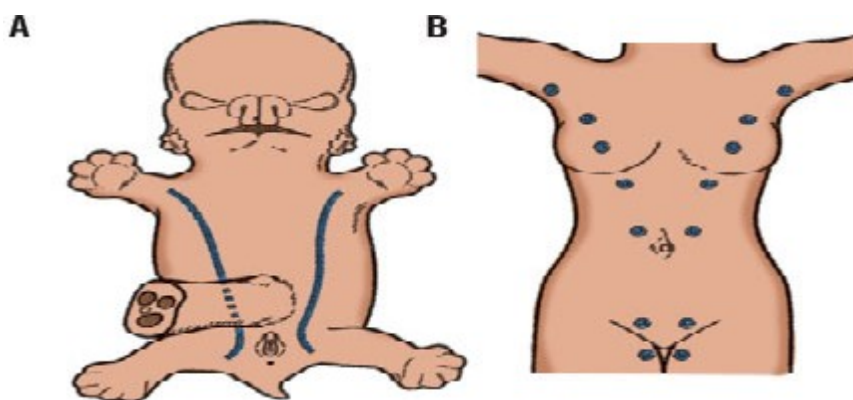
Chapter 1

Embryology & Development of the breast

During the second month of gestation, two bands of slightly thickened ectoderm appear on the ventral body wall extending from above the axilla to below the groin. These bands are the milk lines and represent potential mammary gland tissue (Fig.1). In humans, only the pectoral portion of these bands will persist and ultimately develop into adult mammary glands.

Fig.1: A. The milk lines in a generalized mammalian embryo. Mammary glands form along these lines. B. Common sites of formation of supernumerary nipples or mammary glands along the course of the milk lines in the human.

(St. Louis: Mosby, 2011)



The glandular portion of the breast develops from the ectoderm. It arises from the local thickening of the epidermis (Fig. 2A). From this thickening, 16 to 24 buds of ectodermal cells grow into the underlying mesoderm (dermis) during the twelfth week (Fig. 2B). These buds, at first solid, will become canalized near term to form the

lactiferous ducts (Fig. 2C). The tips of the buds will give rise to the secretory acini during lactation. The epidermal surface of the future nipple is at first a shallow pit (Fig. 2D). Near term it becomes everted (Fig. 2E)

(Prof. Malkanthi Chandrasekhar et al., 2013)

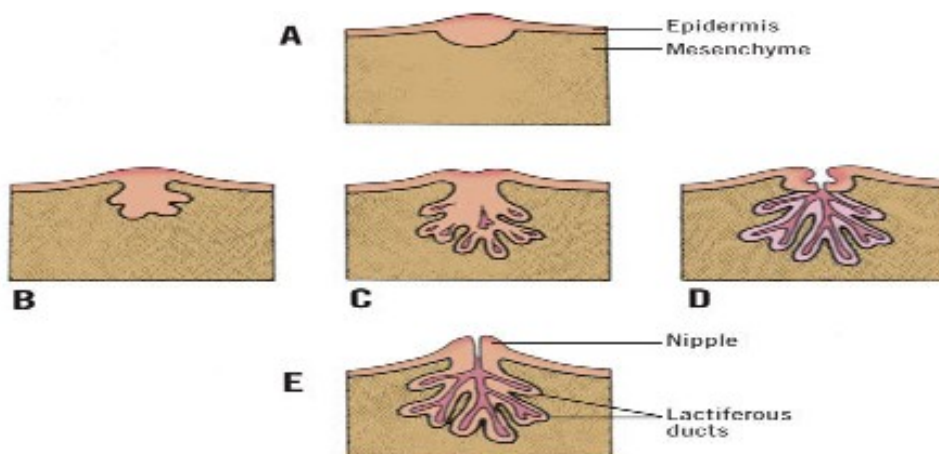


Fig. 2: Development of the breast. A-D. Stages in the formation of the duct system and potential glandular tissue from the epidermis. Connective-tissue septa are derived from the mesenchyme of the dermis. E. Eversion of the nipple near birth. (Jayasinghe Y CR.etal.,2010)

The mammary glands are often considered to be modified sweat glands. The areolar glands (of Montgomery) around, but not on the nipple, appear to be transitional between sweat and lactiferous glands. They serve to lubricate the nipple during lactation (milk production and nursing). The connective-tissue stroma of the breast forms from the mesoderm, which will form the dermis of the skin and the superficial fascia) as well. Fibers forming the suspensory ligaments (of Cooper) will develop from both layers.

(Jayasinghe Y CR.etal., 2010)

Morphology

Each breast is composed of between 15 and 20 lobes within the superficial fascia, which is loosely connected with the deep fascia. These lobes, together with their ducts, are anatomic units, but not surgical units. Between the superficial and deep fasciae is the retromammary (submammary) space, which is rich in lymphatics. In the fat-free area under the areola, the dilated portions of the lactiferous ducts (the lactiferous sinuses) are the only sites of actual milk storage. The ducts are surrounded by a sheath of soft, cellular, intralobular connective tissue derived from the upper papillary layer of the dermis. Between the ducts is the denser, less cellular connective tissue from the reticular layer of the dermis. Because of the radial arrangement of the lobes with respect to the nipple, the site of production of serous or sanguinous fluid emerging upon the surface of the nipple can be determined by stroking the breast tissue with the tip of a finger beginning peripherally and terminating at the nipple. The suspensory ligaments of Cooper form a network of strong, irregularly-shaped connective-tissue strands or bands connecting the dermis of the skin with the deep layer of superficial fascia, passing between the lobes of parenchyma and attaching to the parenchymal elements and ducts.

(Jayasinghe Y CR.etal., 2010)