

CURRENT MODALITIES USED IN THE MANAGEMENT OF THE AXILLA IN CASES OF BREAST CANCER

Essay

*Submitted for Partial Fulfillment of the Master
Degree in General Surgery*

By

Mai Kamal FakhryFahmy

M.B., B. CH.

Faculty of Medicine

Ain Shams University

Under Supervision of

Prof. Dr. RedaAbdEltawabEissa

Professor of General Surgery

Faculty of Medicine

Ain Shams University

Prof. Dr. Mohamed El Sayed El Shinawi

A. Prof. of General Surgery

Faculty of Medicine

Ain Shams University

Dr. Islam Hossam El-Din El-Abbassy

Lecturer of General Surgery

Faculty of Medicine

Ain Shams University

**Faculty of Medicine
Ain Shams University**

2013

الطرق الحديثة المستخدمة في علاج الغدد اللمفاوية الإبطية في حالات سرطان الثدي

رسالة

توطئة للحصول على درجة الماجستير في الجراحة العامة
مقدمة من

الطبيبة/ مي كمال فخري فهمي
بكالوريوس الطب والجراحة
كلية الطب جامعة عين شمس

تحت إشراف

أ.د/ رضا عبد التواب عيسى

استاذ الجراحة العامة
كلية الطب جامعة عين شمس

أ.م.د. محمد السيد الشناوي

استاذ مساعد الجراحة العامة
كلية الطب جامعة عين شمس

د/ إسلام حسام الدين العباسي

مدرس الجراحة العامة
كلية الطب جامعة عين شمس

كلية الطب
جامعة عين شمس
2013



ذلك فضل الله
يؤتيه من يشاء
والله ذو الفضل
العظيم

صدق الله العظيم

سورة الجمعة الآية

(4)



First of all, I thank *Allah* for blessing this work until it has reached its end, as a part of his generous helping throughout my life.

I would like to express my deep gratitude and appreciation to *Prof. Dr. Reda Abd Eltawab Eissa* Prof. of General Surgery, Ain Shams University for his continuous support and supervision.

I would also like to express my gratitude to *Prof. Dr. Mohamed El Sayed El Shinawi*, Ain Shams University for his valuable advice and suggestions.

I sincerely appreciate the supervision of *Dr. Islam Hossam El-Din El-Abbassy*, Ain Shams University who also helped me.

Also, I would like to thank my dear husband *Dr. Mohammed M. El- Nahhal*, for his support throughout my work. He gave me the power and self-confidence to continue, not only this essay but also my life. I want to express my love and appreciation for my brother *Mr. Amro Kamal* and my sister *Marwa Kamal* who helped me inspite of their own responsibilities and commitments.

Finally, I dedicate this effort to my *Precious mother* who has helped me in every moment of my life. Also I dedicate this essay to my family, my lovely children & Friends.

Mai Kamal Fakhry

List of Content

	Page
LIST OF ABBREVIATIONS	I
LIST OF TABLES	III
LIST OF FIGURES	IV
INTRODUCTION	1
AIM OF THE STUDY	3
REVIEW OF LITERATURE	
☒ Anatomy of the Axilla	4
☒ Pathology Of Female Breast Cancer	26
☒ Biological classification of breast cancer	42
☒ Axillary clearance (dissection)	48
☒ Axillary Sampling	83
☒ Sentinel Lymph Node	87
☒ Management of Advanced Axilla as a part of Advanced Breast Cancer	119
Conclusion and Recommendations	124
Summary	125
References	129
Arabic Summary	--

List of Abbreviations

4NAS	Four node axillary sampling
ACOSOG	American College of Surgeons Oncology Group
ALN	Axillary lymph node
ALND	Axillary lymph node dissection
ANC	Axillary node clearance
ANS	Axillary node sampling
ARM	Axillary reverse mapping
ASCO	American Society of Clinical Oncology
BMI	Body Mass Index
cALND	completion ALND
CIS	Carcinoma in situ
DCIS	Ductal carcinoma in situ
EGFR	Epidermal growth factor receptor
ER	Estrogen receptor
FN	False negative
FNA	Fine Needle Aspiration
HE	hematoxylin and eosin
HER2	Human Epidermal Growth Factor receptor
IBCSG	the International Breast Cancer Study Group
IDC	Invasive ductal carcinoma
IDC-NSTS	Invasive ductal carcinomas of no special types
IHC	Immunohistochemical
ITC	Isolated tumor cells
LABC	Locally advanced breast cancer
LCIS	Lobular carcinoma in situ
LLLT	Low-level laser therapy
LVA	lymphatic-venous anastomoses
MLD	manual lymphatic drainage
NAC	Neoadjuvant chemotherapy
NICE	The National Institute for Health and Clinical Excellence
NOS	Not otherwise special
NSABP	National Surgical Adjuvant Breast Project

List of Abbreviations (Cont..)

NSABP	the National Surgical Adjuvant Breast Project
NST	No special type
PCD	Pneumatic compression devices
PgR	Progesterone receptor
pT1	primary tumors
QOL	Quality of life
RAD	Radiotherapy
RCT	Radio and Chemo Therapy Breast Cancer–Related
BCRL	Lymphedema
SLN	Sentinel lymph node
SLNB	Sentinel lymph node biopsy
Tc	Technetium

List of Tables

No.	Table	Page
1-	Biological classification of breast cancer	47
2-	ASCO and NICE recommendations for SLNB	110

List of Figures

No.	Figure	Page
1-	Axillary wall	4
2-	Apex of the axilla	5
3-	Walls of the axilla	5
4-	Arteries of the axilla	10
5-	Lymphatics of the Mammary	10
6-	Axillary lymph node according to the pectoralis minor muscle	14
7-	Brachial Plexus	17
8-	Nerves in the axilla	17
9-	Winging of the scapula	21
10-	Axilliary tail of spence	23
11-	Accessory breast	23
12-	Incidence of breast cancer	27
13-	DCIS, solid type solid filling of the ducts by malignant cells without necrosis	29
14-	DCIS, cribriform type multiple sieves	29
15-	DCIS, comedo type, solid sheets of malignant cells fill the dilated ducts	30
16-	Extension of DCIS into lobule	31
17-	Three aggregates of tumor cells are surrounded by empty spaces simulating vascular lymphatic vessels	31
18-	Desmoplastic stromal reaction characterized by proliferation of fibroblasts in myxoid fibrous stroma with dense eosinophilic	32

	ollagen fibers	
19-	Tubular carcinoma. The irregular neoplastic glands are lined by a single layer of cells with mild nuclear hyperchromasia & irregularity	34
20-	Typical medullary carcinoma with smooth borders	34
21-	Mucinous carcinoma is characterized by tumor cells surrounded by abundant extracellular mucin	34
22-	papillary carcinoma forming complex papillary structures	36
23-	papillary carcinoma	36

List of Figures (Cont..)

No.	Figure	Page
24-	Classic type of infiltrating lobular carcinoma with tuomer cells arranged in single layer traveling between collager fibers	37
25-	Signet ring type of infiltrating lobular carcinoma	37
26-	A mixed pattern of small nests (center)	37
27-	Axillary lymph node dissection	48
28-	Incisions for axillary dissection	51
29-	Major Neurovascular structures to be preserved in an axillary dissection	53
30-	Vessels supplying the pectoralis major muscle	53

31-	Exposure of the pectoralis minor muscle and incision of the investing fascia of the axilla	55
32-	Axillary lymph node dissection	57
33-	Extent of dissection under the ICBN	63
34-	Wond infection	66
35-	post mastectomy seroma	67
36-	Lymphedema	74
37-	Axillary sampling	83
38-	Patent Blue V Dye ampoule	90
39-	Methylene blue dye	91
40-	Isosulfan blue	91
41-	Gamma Probe	92
42-	Identefication of SLN intraoperatively	92
43-	Identification of SLN	93
44-	Sentinel lymph node biopsy of the breast	93
45-	Injection sites of blue dye	93
46-	Intra and peritumoral injection of Patent Blue-V Dye	100
47-	Retro- areolar injection of the dye	100
48-	A case showing the blue lymphatic channel and SLN taking the blue dye (Good uptake)	101
49-	A case showing no uptake of the blue dye by SLN (No uptake)	101

List of Figures (Cont..)

No.	Figure	Page
50-	Techniques of SLNB with local anesthesia	102
51-	Sentinella	103

52-	Exact location of the SN by the surgeon's probe using Sentinella	105
53-	ROLL and SNOLL	105
54-	The SentiMag and its magnetic tracer	106
55-	Schematic representation of the hand held probe from the SentiMag magnetometer for its proposed use in sentinel lymph node detection in breast cancer	106
56-	Advanced axilla	119
57-	Figure a: Preoperative view of the breast tumors	120

INTRODUCTION

Axillary surgery is a critical part of treatment of breast carcinoma its importance is related to staging of disease; prescription of adjuvant therapy and prognoses, for years, complete axillary dissection has remained the standard approach to breast cancer lymphatic staging, its value is still high. But development of sentinel node biopsy has significantly changed the indication of the procedure (*Luini et al., 2005*).

Today treatment of the axilla with surgery remains an integral part of the management of patients with invasive cancer. In general the minimum standard treatment of the axilla involves surgical clearance of axillary nodes from Level I and II. There is yet little evidence that axillary treatment improves survival but the issue remains controversial. The extent to which the axilla should be dissected to provide accurate pathologic information remains unclear. Some authors believe in that a complete axillary dissection (including level III clearance) is necessary to provide accurate information for staging and prognostic purposes. Opponents, however, feel that a partial axillary dissection (only level I and II clearance) reliably assesses the axillary contents and at the same time is associated with less morbidity (*Aslan et al., 2007*).

Axillary lymph node dissection for staging the axilla in breast carcinoma patients is associated with considerable morbidity, such as edema of the arm, pain, sensory disturbances, impairment of arm mobility, and shoulder stiffness (*Schrenk et al., 2010*).

Seroma formation after axillary dissection remains the most common early sequel to breast cancer surgery, surgical approaches have been performed to reduce seroma collection (*Francesco et al., 2012*).

Axillary lymphadenectomy is associated with a higher morbidity of upper limb compared to sentinel node biopsy (*José et al., 2011*).

sentinel node biopsy for breast cancer patients has recently been applied as a less invasive procedure and studies have been done to show if it could be an alternative to axillary node dissection (*Motomura et al., 2004*).

Sentinel lymph nodes (SLNs) are defined as the first lymph nodes receiving lymphatic drainage from the primary tumour and therefore the most likely to harbor metastatic cancer via lymphatic spread. Sentinel lymph node biopsy (SLNB) is now the standard of care in patients with a clinically and radiologically clear axilla in early-stage breast cancer. There is a variety of techniques used in SLNB (*Ahmed and Douek, 2013*).