UPDATES IN AUGMENTATION MAMMOPLASTY

An Essay

Submitted for partial fulfillment for Master Degree in General surgery

By

Mohamed Magdy Elghitany

(M.B., B. Ch)

Under supervision of

Prof. Dr. Hassan Sayed Tantawy

Professor of general Surgery Faculty of Medicine Ain shams University

Dr. Mohamed Ezzat ELserafy Dr. Ahmed Adel Darwesh

Ass. Professor of general Surgery
Faculty of Medicine
Ain Shams University

Faculty of Medicine
Ain Shams University

Faculty of Medicine Ain shams University 2014

بسم الله الرحمن الرحيم

قَالُوا سُبُحَالَكِ ﴿ عِلْمُ لِلَّا لِلَّا لِلَّا كَالَّمْتَنَا إِنَّكَ لَكُ الْحَكِيمُ ﴿ (١٣٤) لَنْكَ الْحَكِيمُ (١٣٥)

صدق الله العظيم

سورة البقرة آية (٣٢)

Acknowledgement

First great thanks to "Allah" who gave me the power to complete this work. Without his care nothing could be achieved.

I would like to express my deepest gratitude and appreciation to **Prof. Dr. Hassan Sayed Tantawy**, Professor of General Surgery, Faculty of Medicine. Ain Shams University, for his encourgement, for his excellent and continuos supervision.

It is agreat pleasure to express my deep sincere thanks. To **Dr. Mohamed Ezzat Elserafy**, Ass. Professor of General Surgery. Faculty of Medicine. Ain Shams University, who devoted much of his time to give me valuble guidance, constructive criticism and follow up of the manuscript of this assay.

I am extremely indebted to **Dr.Ahmed Adel Darwesh**, Lecturer of General Surgery. Faculty of Medicine. Ain Shams University, for his valuable advice, continuous guidance, endless encouragement and for meticulous supervision.

Last but not least, sincere gratitude to My Family and My Wife for their continuous encouragement and spiritual support.

Mohamed Magdy Elghitany

Contents

- Introduction.
- Aim of study.
- Chapter (1): Anatomy of the breast.
- Chapter (2): Anthromorphic measurement of the breast.
- Chapter (3): Types of breast implants.
- Chapter (4):Surgical approaches.
- Chapter (5):Complication of breast augmentation.
- Summary and conclusion.
- References.
- Arabic Summary.

List of Figures

Figure	Title	page
Figure (1):	The breast tissue typically extends from the 2nd rib to the inframammary fold at the 6th or 7th rib, and from the lateral border of the sternum to the anterior axillary line.	2
Figure (2):	Arterial blood supply to the breast.	4
Figure (3):	Lymphatic drainage of the breast.	5
Figure (4):	Innervation of the breast.	7
Figure(5):	Showing the neurovascular supply guided subcutaneously along the medial and lateral ligaments to the NAC.	8
Figure (6):	Fascial anatomy of the breast.	9
Figure (7):	Muscular anatomy of the chest wall.	11
Figure (8):	Shape of breast.	13
Figure (9):	Position of breast.	14
Figure (10):	Breast caliber.	15
Figure (11):	The infra mammary crease.	16
Figure (12):	Breast measurement.	17
Figure (13):	a) the aesthetically perfect breast (no common aesthetic procedures suggested). b) Side view.	17
Figure (14):	Leonardo DaVinci's representation of human body lengths.	18
Figure (15):	Le Corbusier study on body proportions.	18
Figure (16):	The <i>upper row</i> represents a series of breast heights with progressively increasing projection. The <i>lower row</i> represents the same breast profiles with variation according to the factor of gravity.	19

Figure (17):	Frontal dimension ratio progression height over width. Ratios from 0.7 to 1.3 are harmonious.	19
Figure (18):	a) Mushroom deformity due to prosthesis too large in diameter. b) Excessive lateral position of prostheses, leading to asymmetrical breasts.	20
Figure (19):	The squash deformity due to prosthesis with a too-high profile in a tight breast without lifting.	21
Figure (20):	Illustration showing the lines of measurement for the anterior chest, breast, and arm.	22
Figure (21):	(<i>Above</i>) Polyurethane-covered silicone gel-filled breast implant. (<i>Below</i>) The appearance of the polyurethane as seen by electron microscopy.	27
Figure (22):	(<i>Left</i>) The MSI textured surface. (<i>Right</i>) A close-up view of its surface as seen by electron microscopy.	27
Figure (23):	(<i>Above</i>) The Siltex textured-surface, saline-filled breast implant. (<i>Below</i>) A close-up of its surface as seen by electron microscopy.	28
Figure (24):	(<i>Above</i>) The Biocell textured-surface, tissue expander. (<i>Center</i>) The Biocell textured-surface, saline-filled breast implant. (<i>Below</i>) A close-up of the implant's textured surface as seen by electron microscopy.	28
Figure (25):	The "Velcro" effect.	31
Figure (26)	Permanent puckering (folding into ridges) of prosthesis.	31
Figure (27):	Rotation with an anatomic implant.	33
Figure (28):	Gel-filled Mentor implant cut open to show the gel stays inside because it is "cohesive.	35

Figure (29):	Left: Shape-stable cohesive gel-filled Allergan 410 implant maintains its shape when upright. Right: Standard gel filled implant sags toward the bottom.	35
Figure (30):	An overfilled implant will lose the anterior rippling but develop scalloping on the edges.	37
Figure (31):	An under filled saline implant will have increased rippling on the anterior surface.	38
Figure (32):	a) A moderate-profile Mentor 325-ml implant filled with stated minimum of 325 ml. b) Same implant filled with stated maximum of 375 ml. c) Moderate-profile Mentor 325-ml implant filled to stated minimum of 325 ml. d) Same implant filled to stated maximum of 375ml.	39
Figure (33):	a) Gel-filled implant has no ripples on surface or scallops on edges. b) Gel-filled implant maintains smooth contour when patient is lying down.	39
Figure (34):	Tissue has grown around protective strap of a saline filled implant that was removed and replaced for aesthetic reason.	41
Figure (35):	a) 31-year-old patient with 255-ml submuscular saline-filled implants with Baker III capsular contracture. b) The implants feel firm and the superior hemispheres are visibly protruding. c) The right-side implant has deflated. d) Deflated right implant and Baker III contracture on the left side. The same contracture on the right probably caused the fold flaw failure and deflation. e) After insertion of new sizesubmuscular saline-filled implants. f) Baker I result. Implant feels soft and superior hemisphere is no longer convex.	42

Figure (36):	 a) 51-year-old patient with Baker IV capsules around submammary gel-filled implants. b) Mammogram showing calcified capsule around implant. c) After complete capsulectomy and insertion of smooth gel-filled 240-ml implants beneath pectoralis muscle. d) Baker I result. a) Thin patient with saline-filled implants who 	43
Figure (37):	has minimal soft tissue coverage. Scalloping of implants can be seen. b) Patient with edges of implant highly visible and palpable. c) Patient with gel-filled implants in whom the edges are not prominent.	44
Figure (38a)	Submammary pocket.	46
Figure (38b)	Sub mammary breast augmentation. a) $I-3$ Preoperative. b) $I-3$ Six months postoperative, with Mentor 175-ml round cohesive-gel implants inserted in the submammary pocket bilaterally.	47
Figure(39a):	Subpectoral pocket.	48
Figure(39b):	Subpectoral breast augmentation. a) $1-3$ Preoperative. b) $1-3$ One year postoperative, with Mentor 200-ml round cohesive gel implants inserted in the subpectoral pocket bilaterally.	49
Figure (40):	Dual-plane breast augmentation (Tebbetts, 2001).	50
Figure (41):	Surgical approaches for augmentation mammoplasty.	56
Figure(42):	surgical approaches for augmentation mammoplasty.	56
Figure (43):	Through a periareolar incision, access to the underside of the breast can be achieved by using a direct transparenchymal dissection that extends directly toward the chest wall. This approach provides direct exposure to the underside of the breast at the expense of potentially seeding the	58

	implant pocket with bacteria present within the	
71	breast ducts.	
Figure (44):	Surgical approaches for augmentation mammoplasty.	59
Figure (45):	AP view with commonly used dimensions for aesthetic analysis and planning.	60
Figure (46):	Inframammary approach to subglandular breast augmentation.	64
Figure (47):	Surgical approaches for augmentation mammoplasty	70
Figure (48):	(Above) Axillary incision location. A-line indicates the middle of the lateral border of the pectoralis. The dot is located in the apex of the hair-bearing skin of the axilla. (Center) The incision begins not less than 1 cm posterior to the posterior edge of the pectoralis lateral border, passes through the dot in the apex of the axilla, and continues high in the posterior axilla to minimize visibility. (Below) A properly located incision is invisible with the patient's hand is on her hip.	75
Figure (49):	The right-angled endoscope-retractor system. (<i>Below</i>) The Probe Plus II dissecting instrument incorporates a retractable sleeve that covers or exposes a needle tip (<i>inset</i>), a cut and coagulation current rocker switch on top of the pistol-grip hand piece, and suction and irrigation controls on the rear of the pistol-grip hand piece (<i>inset</i>).	76
Figure (50):	Retractor positions for pocket dissection. Precise retractor positioning and minimal retractor movements minimize tissue trauma and bleeding while optimizing control.	76
Figure (51):	The 50-cm-long dissector with a 1-cm-diameter rhomboid shaped plastic tip.	77

Figure (52):	Introduction of the expander into the subglandular pocket with the PIC.	78
Figure (53):	The prosthesis is filled with saline to improve the subglandular pocket. The expander will be replaced by a permanent prosthesis with the PIC.	78
Figure (54):	(a) Preoperative augmentation mammoplasty. (b) Six months postoperative with steroid-containing prosthesis. (c) Bilateral ptosis occurring with the steroid-containing prosthesis. (d) Capsular contracture on left developed following prosthesis exchange to non-steroid-containing implant.	80
Figure (55):	Possible —activators of capsular contracture.	81
Figure (56):	Superior displacement (arrow) on the right side.	84
Figure (57)	Double bubble on the patient's left breast.	85
Figure (58):	Rotation of anatomic implant on the patient's left Breast.	86
Figure (59):	Hematoma on left breast.	87
Figure (60):	Rippling.	87
Figure (61):	Infection of right infra-mammary wound with improper scar position.	88
Figure (62):	Improper scar placement.	89
Figure (63):	Mondor's diseas.	90
Figure (64):	a) Synmastia secondary to dissection of the pockets to the midline of the sternum. b) Same patient.	91

List of Tables

Table	Title	Page
Table (1):	Lymphatic drainage of the axilla.	6
Table (2):	Muscular Anatomy Relevant to Breast Surgery.	12
Table(3):	Different implant pockets and specific recommendations for the use of each.	52-53
Table (4):	Breast Augmentation Planning.	55
Table (5):	Classification remains the prevalent system for grading capsular contracture.	82
Table (6):	Explain the comparison between the Baker (clinical) and Wilflingseder (histological) classification of capsular contracture.	82

List of Abbreviations

ASAPS: American Society for Aesthetic Plastic Surgery

BJPS: British Journal of Plastic and Reconstructive Surgery

CT : Computed tomography

FDA: Food and Drug Administration

GA: General anaesthesia

IMF: Infra mammary fold

IMN: Internal mammary node

IV :Intravenous

LA :Local anaesthetic

MCP: Mid clavicular point

NAC: Nipple areola complex

N-IMF: Nipple to inframammary fold

PEG:polyethylene glycol

PMM: Pectoralis major muscle

PRS :Plastic and Reconstructive Surgery (journal)

PT: Soft tissue pinch test

SC: Subcutaneous, subcuticular

SFCC: Spherical fibrous capsular contracture

SN-N: Sternal notch to nipple distance

SSN: Supra sternal notch

STF: Superficial thoracic fascia

Introduction

Breast augmentation increases the size and enhances the shape of a woman's breasts, but more importantly, it will improve her self esteem. The history of breast augmentation has been made interesting by such sentinel events as the introduction of silicone implants, the subsequent placement of a moratorium on silicone gel implants by the FDA in 1992, and the repeal of that moratoriumin 2006 after numerous studies demonstrating their safety. The idea that a well-planned operative approach will facilitate goodlong-term results is paramount. The various types of implants, incisions and pocket locations will be discussed. The indications, advantages, and disadvantages of the various techniques will be explained, including endoscopic transaxillary augmentation.

Understanding of possible complications, and knowing the techniques that are on the horizon are also key parts of the study (**Kreymerman**, 2010).

And By recognizing and analyzing the multiple variables that can affect the result and strategically applying the technical details outlined in this study, consistent and aesthetic results can be obtained(Hoyer, 2005).

Currently, there are several alternatives when selecting the surgical approach and the specific type of breast implant for a given patient. Ultimately, decisions about the size, shape, surface texture, and filling material must be made in conjunction with the recommendations of the surgeon and the desires of the patient. However, there is not one strategy for achieving all of the goals of breast augmentation for every patient. Recognizing

that augmentation mammaplasty is both a science and an art, it is imperative that the surgical approach, the creation of the implant pocket, the implant selection, and the implant position must always be tailored to the individual patient (Maxwell, 2011).

Surgeons performing breast augmentation have to be well informed, not only about the variety of techniques that are available but also about the possible risks and complications of the procedure. The surgeon should be capable of deciding which procedure to use to correct any defect or deformity and of avoiding or treating the variety of possible complications of the surgery. The patient should understand that the possibility exists for a second or even third procedure on the breast after augmentation.

Aim of Study

This study aims to discuss different techniques and updates of Augmentation mammoplasty in cases of small breast.