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Anthropometric Measurements of the Egyptian Female Breast; and Its Effect on Decision Making in Breast Reduction

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ABSTRACT

Background: An essential part of aesthetic surgery is understanding of ideal measurements of the body. These are the guidelines which allow for interpretation, manipulation, and modification in order to create or recreate a determined aesthetic outcome.

Objective: To provide anthropometric measurements of the Egyptian female breast to compare them with those of women in other nations and to determine the effect of breast parameters on the preoperative decision making for the technique of breast reduction surgery.

Patients and Methods: This prospective interventional study was carried out on 200 Egyptian females measuring 18 parameters to describe average anthropometry of Egyptian female breast, 20 female patients from the 200 Egyptian females had breast reduction surgery at the Plastic and Reconstructive Surgery Department, Faculty of Medicine, Tanta University Hospitals in the period between July 2019 and July 2020.

Results: Our results were able describing the average measurements of the breasts of Egyptian female population and the effect of age, parity, and obesity on these measurements, as well as the average measures of those seeking for breast reduction surgery. We believe that the perception of the female breast shape varies accordingly in different nations and countries.

Conclusions: Describing the average anthropometric measurements of the Egyptian female breast helps in the assessment of applicants for breast reduction as well as augmentation and reconstruction. This may also increase the predictability of the results and enable the surgeons to plan and choose the best technique improving the patient's satisfaction and aesthetic outcome.

Ethical Committee: Approval: The ethics committee of Tanta University's Faculty of Medicine gave its authorization before the investigation was carried out (33336/09/19). All patients provided written consent after being fully informed.

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INTRODUCTION

The breasts are one of the secondary sexual characteristics of the female gender, and their volume, breadth, length, projection, density, composition, form, and location vary greatly **[1]**.

The size and form of the breasts fluctuate based on the proportion of fatty to glandular tissue. Obese female breast size and shape are always larger than those of average females. It is common to see a size discrepancy between the two breasts in women without an endocrine issue **[2]**. Adult women who have never given birth have conical-shaped breasts that may become ptotic after nursing. During menstruation, pregnancy, and breastfeeding, the size, hardness, and nodularity of a woman's breasts may fluctuate **[3]**.

Breast hypertrophy can be defined as progressive and massive enlargement of one or both breasts due to multifactorial causes which are usually idiopathic, associated with obesity or hormonal imbalances. On examination, the breasts are disproportionately large and pendulous beyond the physiological limits **[4]**.

Patients pursue breast reduction in the hopes of enhancing their quality of life by reducing social and sexual shame and facilitating physical activity. Several studies have established the efficacy of reduction mammoplasty in enhancing quality of life **[5]**. Reduction mammoplasty is highly helpful in addressing functional, cosmetic, and psychological issues.

Absence of a uniform technique for breast anthropometry poses the greatest obstacle in ob-

jectively assessing breast shape. The concept of an ideal breast differs throughout races; nonetheless, there are universally acknowledged characteristics. A proportionate breast size, lack of ptosis, teardrop form, and anteriorly positioned nipples are some of the criteria of an aesthetically pleasing breast **[6]**.

There has been few research conducted on breast anthropometry. The breast's volume, substance, and placement on the chest wall vary widely. The look of the breasts is also affected by the body and the extremities.

Surgeons commonly believe that the ideal breast form is that of a breast augmentation patient, where the breast shape does not extend beyond the breast boundaries; however, each patient's breast footprint is unique. A breast form that diminishes the breast footprint to a certain degree may be appropriate and visually pleasant. Unattractive are breasts that do not fit the optimum footprint or that dangle too far off the optimal footprint. The surgeon can then describe the strategy to the patient so she can have realistic and appropriate expectations **[7]**.

This study aims to:

Provide anthropometric measurements of the Egyptian female breast. Determine the effect of breast parameters on the preoperative decision making and on the postoperative aesthetic outcome.

PATIENTS AND METHODS

This prospective interventional study was carried out at the Plastic and Reconstructive Surgery Department, Faculty of Medicine, Tanta University Hospitals in the period between July 2019 and July 2020. The Ethics Committee of Tanta University's Faculty of Medicine gave its authorization before the investigation was carried out (33336/09/19). All patients provided written consent after being fully informed.

Breast anthropometric measurements were taken for 200 Egyptian females with age ranging from 18-45 years, and variable marital and maternal status, excluding those with history of previous breast surgery.

The following parameters were measured in a standing position for all of 200 females:

1- Body weight and height.
2- Body mass index (BMI).
3- Shoulder width.
4- Upper chest width (CC1).
5- Middle chest width (CC2).
6- Lower chest width (CC3).
7- Waist width.
8- Hip width.
9- Upper arm length (HL) (from acromion process to the tip of the olecranon process).
10- Clavicle-nipple length (CNL).
11- Sternal notch-nipple length (SNL).
12- Medial mammary radius (MR).
13- Lateral mammary radius (LR).
14- Nipple-inframammary fold length (IR).
15- Nipple diameter (ND).
16- Areola diameter (AD).
17- Vertical breast height (BH) (from breast upper border to inframammary fold).
18- Breast width (BW) (from medial to lateral border).

Twenty patients out of 200 females were seeking breast reduction surgery. They were asked to describe their actual complain.

- Back pain.
- Breast pain.
- Neck pain.
- Skin rash under the breast.
- Difficulty in finding clothes that fit properly.
- Bra straps discomfort.
- Embarrassing comments from others.
- Difficult in performing physical activities.
- Respiratory difficulties.
- Sexual embarrassment.
- Headache.

They were also asked about the most important aspect of their life affected by breast condition: (Physical activity - social activity - sexual activity).

Routine preoperative evaluation and laboratory investigations were done.

Standard preoperative photos in different position (dead lateral, oblique, anteroposterior view, and patient putting her hands in her waist) were taken in standing position. All photos were taken from shoulder to umbilicus to maintain patient confidentiality and preserving her privacy.

Photos were discussed with the patient about future scar site with its sequelae to ensure that she has realistic expectations.

Statistical analysis:

Statistical analysis of the anthropomorphic breast measurements were done for 200 female

breasts, in order to know the mean and the standard deviation (SD) for each parameter.

Statistical analysis was performed using Statistical Package for the Social Sciences (SPSS) software (Version 24.0, SPSS Inc., Chicago, IL, USA). *p*-values less than 0.05 (5%) was considered to be statistically significant.

RESULTS

Weight, BMI and Circumferential measurements and its relation to age of the 200 Egyptian females: Statistically significant increase in weight and BMI were found in age group between 30-40 years compared to other age groups.

While circumferential measurements were significantly higher in age group ≥40 years. Table (1).

Statistically significant increase in all anthropometric measurements in multipara >2 compared to other groups. Table (2).

Statistically significant differences were found in most anthropometric measurements except AD and BW between right and left breasts at ($p \leq 0.05$); as well as significant increase of measurements in the left breast in most Egyptian females. Table (3).

We found a positive correlation between height, and all vertical anthropometric breast measurements [CNL, SNL, ND and BH]. While there is negative correlation between height and BW. Pearson's correlation coefficients and *p*-values. Table (4).

Results for 20 operative cases:

We found a statistically significant increase in all breast anthropometric measurements in favor of patients group (n=20) compared with group (n=200). There were no significant differences at ($p \leq 0.05$) between two groups in height, shoulder width and HL. Table (5).

Comparison between parity related to anthropometric measurements of the Breasts: There was statistically significant increase in all anthropometric measurements group except AD and BW in nullipara group compared to other groups. Table (6).

Comparison of anthropometric breast measurements between urban and rural areas: There were statistically significant increases in all anthropometric measurements group in rural areas compared to urban areas. Table (7).

Preoperative patient's main complaints:

The most prevalent symptom among the patients was back pain (80% of patients), followed by the difficulty in daily work (75% of patients), then the difficulty to find fitting cloths (70% of patient.

Patients coming from rural areas suffer mainly from interference with their daily work and activities. While patients coming from urban areas suffered mainly from embarrassing comments and social inconvenience. (Table 8).

Table (1): Circumferential measurements and its relation to age.

Age Measurement	<30 (n=62)		30 : <40 (n=102)		≥40 (n=36)		*p*
	Mean	SD	Mean	SD	Mean	SD	
Weight	70.97	9.76	72.99	8.96	72	6.11	<0.03
BMI	26	5.16	27.87	5.61	27.6	7.01	<0.02
Waist width	83.60	11.18	84.30	10.45	85.70	12.38	<0.01
Hip width	94.08	18.91	96.08	19.76	99.89	17.76	<0.01
CC1	87.02	14.87	87.32	13.79	89.08	15.03	<0.02
CC2	90.71	19.31	91.76	18.35	92.61	19.54	<0.03
CC3	83.78	12.51	85.81	13.54	85.73	11.76	0.04

CC1: Upper chest width.
CC2: Middle chest width.
CC3: Lower chest width.

Table (2): Relation between parity and anthropometric breast measurements.

Measurement	Parity				*p*
	Nullipara (n=94)	Multipara			
		1 (n=30)	2 (n=41)	>2 (n=45)	
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ±SD	
CNL	21±1.8	22.1±2.3	22.8±3.1	23±2.9	<0.01
SNL	22.3±1.6	22.9±2.5	23.4±2.8	24.1±2.7	<0.01
IR	7.8±2.9	8.6±1.3	9.5±2.5	9.8±2.6	<0.01
MR	10.2±1.7	10.8±2.1	11.3±2.6	11.7±1.8	<0.01
LR	10.9±2.6	11.3±2.4	11.9±2,5	12.3±1.9	<0.01
ND	1.2±0.21	1.6±0.3	1.7±0.18	1.9±0.13	<0.01
AD	3.4±0.18	4.5±0.51	4.8±0.37	5.1±0.32	<0.05
BH	14.3±2.8	15.4±3.0	15.6±3.1	16.0±2.9	<0.01
BW	22.12±1.6	22.7±1.7	23.0±2.1	23.5±2.3	<0.05

CNL : Clavicle-nipple length. LR : Lateral mammary radius. AD : Areola diameter.
SNL : Sternal notch-nipple length. IR : Nipple-inframammary fold length. BH : Vertical breast height.
MR : Medial mammary radius. ND : Nipple diameter. BW : Breast width.

Table (3): Comparison of the anthropometric measurements of the Right and Left Breasts.

Measurement	Right Breast	Left Breast	*p*
	Mean ± SD	Mean ± SD	
CNL	22.2±3.6	22.7±3.3	<0.01
SNL	22.6±3.4	22.8±3.2	<0.01
MR	11.9±2.8	12.7±3.4	<0.01
LR	12.8±3.3	13.9±3.9	<0.01
IR	9.5±2.9	9.7±3.2	<0.01
ND	1.7±0.52	1.9±0.43	<0.01
AD	4.9±0.9	4.9 ±0.9	0.14
BH	16.9±3.7	17.3±3.9	<0.01
BW	25.02±2.4	24.6±2.3	.165

CNL : Clavicle-nipple length. LR : Lateral mammary radius. AD : Areola diameter.
SNL : Sternal notch-nipple length. IR : Nipple-inframammary fold length. BH : Vertical breast height.
MR : Medial mammary radius. ND : Nipple diameter. BW : Breast width.

Table (4): Correlation between age, body weights, height and BMI, and anthropometric breast measurements (N=200).

Measurement	Age		Weight		BMI		Height	
	r	*p*	*r*	*p*	*r*	*p*	*r*	*p*
CNL	0.67**	<0.01	0.77**	<0.01	0.69**	<0.01	0.16*	<0.05
SNL	0.59**	<0.01	0.78**	<0.01	0.70**	<0.01	0.15*	<0.05
IR	0.52**	<0.01	0.67**	<0.01	0.60**	<0.01	0.14	0.06
MR	0.16*	<0.05	0.56**	<0.01	0.55**	<0.01	0.05-	0.47
LR	0.23*	<0.05	0.52**	<0.01	0.50**	<0.01	0.016-	0.82
ND	0.36**	<0.01	0.15-*	<0.05	0.20-**	<0.01	0.19**	<0.01
AD	0.61**	<0.01	0.64**	<0.01	0.62**	<0.01	0.012-	0.86
BH	0.56**	<0.01	0.66**	<0.01	0.56**	<0.01	0.27**	<0.01
BW	0.16*	<0.05	0.71**	<0.01	0.73**	<0.01	0.17-*	<0.05

CNL : Clavicle-nipple length. LR : Lateral mammary radius. AD : Areola diameter.
SNL : Sternal notch-nipple length. IR : Nipple-inframammary fold length. BH : Vertical breast height.
MR : Medial mammary radius. ND : Nipple diameter. BW : Breast width.

Table (5): Comparison for anthropometric measurements of the breasts between 200 Egyptian females and 20 patients seeking breast reduction.

Measurement	n=200	n=20	*p*
CNL	22.45±3.4	32.12±2.7	<0.01
SNL	22.8±3.2	32.67±2.9	<0.01
MR	12.3±2.9	21.6±2.4	<0.01
LR	13.4±3.6	23.35±3.12	<0.01
IR	9.5±2.6	14.43±2.91	<0.01
ND	1.8±0.50	2.3±0.60	<0.01
AD	4.9±0.9	5.34±0.89	<0.01
BH	17.1±3.78	26.8±4.13	<0.01
BW	24.55±2.35	25.3±2.64	<0.01

CNL : Clavicle-nipple length. LR : Lateral mammary radius. AD : Areola diameter.
SNL : Sternal notch-nipple length. IR :Nipple-inframammary fold length. BH : Vertical breast height.
MR : Medial mammary radius. ND : Nipple diameter. BW : Breast width.

Table (6): Comparison between parity related to anthropometric measurements of the breasts.

Measurement	Parity				*p*
	Nullipara (n=5)	Multipara			
		1 (n=3)	2 (n=5)	>2 (n=7)	
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ±SD	
CNL	32.8±2.4	29.7±2.5	30.8±2.3	31.9 ±2.1	<0.01
SNL	32.7±2.6	30.2±2.6	31.1±2.4	32.1 ±2.2	<0.01
IR	14.3±1.7	12.8±2.3	13.1±2.6	13.9 ±2.1	<0.01
MR	21.2±2.3	19.9±2.1	20.4±1.9	20.8 ±2.1	<0.01
LR	23.6±2.1	21.8±1.7	22.7±1.7	22.9±2,7	<0.01
ND	1.8±0.3	1.7±0.17	1.9±0.16	2.2±0.17	<0.01
AD	4.7±0.61	4.9±0.38	5.1±0.35	5.2 ±0.46	<0.05
BH	27.7±4.0	25.9±4.2	26.0±3.9	26.6±4.1	<0.01
BW	25.4±2.8	23.7±2.2	24.5±2.4	24.7 ±2.3	<0.05

CNL : Clavicle-nipple length. LR : Lateral mammary radius. AD : Areola diameter.
SNL : Sternal notch-nipple length. IR : Nipple-inframammary fold length. BH : Vertical breast height.
MR : Medial mammary radius. ND : Nipple diameter. BW : Breast width.

Table (7): Comparison of anthropometric breast measurements between urban and rural areas.

Measurement	Urban areas n=11	Rural areas n=9	*p*
CNL	30.9±2.4	31.8±2.2	<0.01
SNL	31.6±2.2	32.5±2.4	<0.01
MR	19.8.4±1.6	20.3±1.8	<0.01
LR	21.9±1.8	22.7±2.1	<0.01
IR	13.7±1.6	14.1±1.7	<0.01
ND	1.8±0.16	1.9±0.2	<0.01
AD	4.8±0.45	5.1±0.51	<0.01
BH	26.0±3.1	26.9±3.9	<0.01
BW	24.4±2.3	24.8±2.6	<0.01

CNL: Clavicle-nipple length.
SNL: Sternal notch-nipple length.
MR : Medial mammary radius.
LR : Lateral mammary radius.
IR : Nipple-inframammary fold length.
ND : Nipple diameter.
AD : Areola diameter.
BH : Vertical breast height.
BW : Breast width.

Table (8): Preoperative patient's main complaints.

Measurement	Patients No. (%)
Back pain	16 (80%)
Breast pain	13 (65%)
Neck pain	9 (45%)
Headache	5 (25%)
Difficulty finding fitting cloths	14 (70%)
Bra strap discomfort	13 (65%)
Difficulty in daily work	15 (75%)
Respiratory difficulties	7 (35%)
Embarrassing comments	8 (40%)

Anthropometric breast measurements were used as a guide for our choice of reduction technique, we found that for SNL ≥35cm inferior pedicle technique become a suitable choice, and when using superior pedicle technique inverted T skin incision become more suitable for vertical breast height more than 25cm and breast width more than 24cm rather than vertical skin incision alone.

Case (1) and Case (2) are examples of our cases of breast reduction. Figs. (1,2).

Case (1)

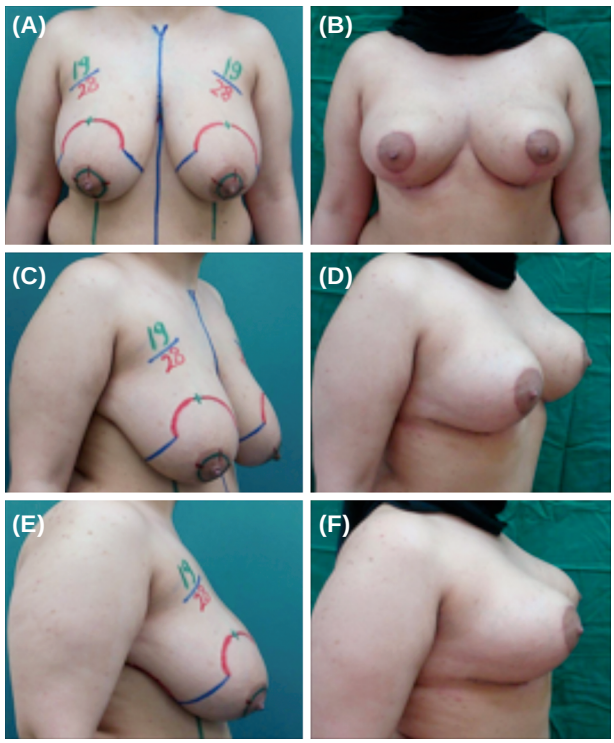

Fig. (1): This 35-year-old woman presented for breast reduction surgery (A) Antero posterior view preoperative images with surgical pre-operative marking. (B) Antero posterior view, three months after reduction mammoplasty with the superior pedicle inverted T scar technique. (C,D) Right oblique view pre and post-operative. (E,F) Right dead lateral view pre and post-operative. Showing nice breast shape, size and symmetry with upper pole fullness.

Case (2)

Fig. (2): This 39-year-old woman presented for breast reduction surgery (A) Antero posterior view preoperative images. (B) Antero posterior view, nine months after reduction mammoplasty with the superior pedicle inverted T technique. (C,D) Right oblique view pre and post-operative with red circular mark planned surgical excision of benign breast mass during surgery. (E,F) Right dead lateral view pre- and post-operative. (G,H) Left oblique view pre- and post-operative. (I,J) Left dead lateral view pre- and post-operative.

DISCUSSION

Female identity, and hence the size, shape, and symmetry of a woman's breasts, can have a significant impact on her mental and physical health **[8]**.

The breast is one of the most challenging organs to properly evaluate. In addition to size, shape, volume, and asymmetry must be regarded **[9]**.

Individual changes in the makeup of the breast consisting of fat, skin, glandular, and connective tissue are frequently linked to variations in adipose tissue. Heritability has been found as a factor in the development of breast size and hormonal alterations **[10]**.

The absence of a consistent technique for breast anthropometry footprint and its relationship to other metrics is the principal obstacle in the evaluation of breast shape **[11]**.

Understanding geometric anthropometric ratios and their link to beauty, as well as objectively defining the ideal aesthetic morphology, are indispensable and important guides for establishing surgical targets **[11]**.

This prospective interventional study was conducted in the Department of Plastic and Reconstructive Surgery, Faculty of Medicine, Tanta University Hospitals in the period between July 2019 and July 2020. It was performed on 200 Egyptian females (anthropometric measurements were taken for all 200 subjects while, only 20 out of the 200 had breast reduction surgery.

The mean age of Egyptian female group of study was 31.81±4.65, the mean value of the body weight was 81.4±8.93, mean BMI was calculated as 31.60±4.17, mean value of the height was 160.75 ±3.79, and mean HL was 30.92±1.94.

Regarding age, the studied group of Egyptian females showed significant increase in weight, body mass index and all circumferential anthropometric breast measurements in the age group between 30-40 years while the vertical measurements were significantly increase in the age group above 40 years.

Studying the effect of parity showed significant increase in all breast's anthropometric measurements in multipara ≥2 childbirth compared to less parity group.

As expected, Egyptian female bodies with increased age and parity are usually exposed to progressive changes. These previous results explained the majority of female in our study seeking for breast reduction who were found to be between 30-40 years (15 out of 20) and were having more than 2 childbirths (13 out of 20).

Kim et al., 2014 found that circumferential body measurements, weight and BMI were increased with age in the premenopausal Korean women **[12]**.

By comparing anthropometric measurement of two breasts in our sample, we found that measurements of left breast were significantly larger than right one in most Egyptian females (76%).

Wistrich, 1997 from Israel found that the left breast volume was larger than the right breast volume at all ages of his study groups **[6]**.

Luskin et al., 2005 (120) in a study of Eighty-seven women from Atlanta using 3-Dimensional Images found that the left breast measurement being greater most of the time by (62%). The nipple-to-notch asymmetry was on average 3.2%, with left breast being larger than the right **[13]**.

Also, Avşar et al., 2010 **[1]** study on 385 Turkish women found that the left breast measurements significantly higher than those of right breast **[1]**.

We compared anthropometric Egyptian breast measurements with measurements reported from other nationalities and races in the literature.

In the current study, the mean value of the SNL for breast was (22.8±3.2). It was similar to Korean measurements (22.0±2.6). While African (Ghana) measurements (20.97±6.6) and it was around 19.6±2.2 in Turkish, Saudi and Chinese.

In our study, the mean value of the IR for breast was (9.5±2.6). It was nearly similar to African (Ghana) study (9.36±4.9). While in Saudi study it was (7.7±1.6) and around (6.3±1.4) in Chinese and Korean studies.

The mean value of the AD for breast was (4.9 ±0.9) it was nearly similar to Saudi's study (4.5 ±1.4). While it was (3.6±0.9, 3.3±0.5) in Turkish and Chinese studies.

Comparing our anthropometric measurements with reports of other races or nationalities were not complete due to the shortage of the reports and their use of non-identical anthropometric parameters. We believe that the perception of the female breast shape and volume varies in different nations and countries.

The idea of breast hypertrophy transcends a straightforward description of breast size. Breast

hypertrophy is the enlargement of the breast gland above its normal limitations, with the exception of injuries, haemorrhages, inflammation, and pregnancy **[14]**.

Breast hypertrophy has been and will continue to be a difficulty for breast surgeons, who are always striving for perfection and addressing the issue. In recent decades, breast reduction procedures have proliferated **[15]**.

The study showed that for 20 females who sought breast reduction; 75% were between 30-40 years, 65% were married, 75% multipara, 65% had family history of macromastia and 55% were from urban areas. Mean BMI was calculated as 34.31± 5.13.

By comparing physical characteristics for 20 patients coming for breast reduction and our sample of 200 Egyptian females, we found significant increase in all circumferential body measurements, weight and BMI while no difference in height, shoulder width and HL. Regarding the anthropometric breast measurements, they were all found to be significantly increased.

This coincides with Brown et al., 2012 who reported that body weight and BMI demonstrate strong relationships to breast mass and anthropometry. All variables (excluding height) were significantly greater in females with large breasts **[10]**.

This reflects that nulliparous females seeking breast reduction usually complained from very large breasts that interfere with their daily activities and cause severe back and breast pain.

We found that in patients seeking breast reduction, all anthropometric measurements were significantly increased in rural areas compared to urban areas.

This reflects that females from rural areas seeking breast reduction usually complained from very large breasts that interfere with their daily activities and cause severe back and breast pain, which reveals that acceptance of breast reduction surgery in rural areas still needs very strong motivation.

Anthropometric breast measurements were used as a guide for our choice of reduction technique, we found that for SNL ≥35cm inferior pedicle technique become a suitable choice, and when using superior pedicle technique inverted T skin incision become more suitable for vertical breast height more than 25cm and breast width more than 24cm rather than vertical skin incision alone.

Samyd S. Bustos, et al., 2021 found that the mean sternal notch-to-nipple (SN-N) distance was 31.5cm and the mean nipple-to-inframammary fold (N-IMF) distance was 14.8cm was suitable to choose Inferior pedicle breast reduction **[18]**.

According to Kececi Y et al., 2014 they found that for prediction to choose the best technique for reduction mammoplasty, sternal nipple length and nipple-inframammary fold length measurements had the highest correlation coefficient value **[16]**.

Only (15%) of patients in our study complained of decreased NAC sensation two of them had inferior pedicle technique and one with superior pedicle technique.

While two of our patients operated with inferior pedicle technique showed minor wound dehiscence, they were treated conservatively with restriction of arm movements and daily dressing.

We found a dramatic improvement in patients' physical and psychological symptoms after breast reduction. Patients became highly satisfied from result of operation, and they became more positive about life and the future when they finally have healthy and aesthetic breasts. Anthropometric breast measurements besides helping the surgeon to choose the best suitable technique may also orient the patient about the magnitude of her problem to predict the possible outcome accept the scar and improve the post-operative satisfaction.

Conclusions:

Anthropometric measurements of the breasts and their relative position taken from fixed skeletal locations are a valuable tool for the proper preoperative evaluation of patients and evaluation of surgical outcomes **[17]**. It is anticipated that anthropometric measures would vary between ethnic groups, and that geographical and sociocultural variances may influence patients' post-surgery expectations. It is necessary to consider these variances in the nation where surgery is conducted to enhance patient satisfaction. Describing the average anthropometric measurements of the Egyptian female breast helps in the assessment of applicants for breast reduction as well as augmentation and reconstruction. This may also increase the predictability of the results and enable the surgeon to plan and chose the best technique improving the patient satisfaction and aesthetic outcome.

Limitations of the study:

Small sample size and so we recommend to continue to take these Anthropometric measurements of the breasts on a large group of people.

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