

# **ORIGINAL ARTICLE**

# NIPPLE, AREOLA & SKIN SPARING MASTECTOMY; IS IT ONCOLOGICALLY SAFE PROCEDURE IN EGYPTIAN FEMALES

## Galal Abou El-Nagah,<sup>1</sup> Basma El-Sabaa<sup>2</sup>

<sup>1</sup>Department of Surgery, <sup>2</sup>Department of Pathology, Faculty of Medicine, Alexandria University, Egypt

Correspondence to: Galal Abou El-Nagah, Email: galalmma@hotmail.com

## Abstract

**Introduction:** Many articles have been published on the safety of skin sparing mastectomy (SSM). Success with skin sparing mastectomy has led to the reconsideration of the necessity to remove the skin overlying the nipple-areola complex. Leaving this area will improve the cosmetic appearance of the reconstructed breast which is the optimal aim of skin sparing mastectomy. The aim of this study is to prove whether or not the Nipple Areola Skin Sparing Mastectomy is oncologically safe in Egyptian females.

**Methods:** This study included 64 cases of operable breast cancer that underwent modified radical mastectomy in the period between January 2010 and December 2010. The excluding criteria were patients who have received chemotherapy and patients who had skin changes involving nipple areola complex. All specimens were subjected to histopathological examination of the subareolar tissue examination searching for malignancy in the subareolar tissue. Patients' demographics, tumor and histological characteristics were analyzed & correlated with pathological results.

**Results:** In 12 cases (18.8 %), the subareolar tissue was positive for malignancy. Positive predictive value was tumor size >4 cm, distance between tumor and nipple <6 cm ( $\rho$  = 0.05).

**Conclusion:** Nipple areola skin sparing mastectomy appears to be oncologically safe providing that the tumor is small and not close to the nipple and the areola.

Keywords: Nipple-areola complex, cancer breast, breast reconstruction.

## INTRODUCTION

Treatment of cancer breast has significantly improved over the last few decades, surgery remains of great importance as first line management. Surgical strategies have changed significantly and the objective of modern breast cancer surgery is to maintain oncological efficacy while reducing radical procedures so as to reduce the patients' physical and psychological insult. Breast conservative surgery and selective lymphadenectomy according to the sentinel lymph node biopsy are examples of this policy.<sup>(1-2)</sup> Toth and Lappert were the first to introduce the idea of skin sparing mastectomy (SSM), for better cosmesis and to facilitate the immediate breast reconstruction.<sup>(3)</sup> Skin sparing mastectomy describes the surgery that maximizes the native breast skin envelope and infra-mammary fold preservation; significantly improving the symmetry and natural appearance of the breast and so increasing postoperative patient satisfaction.4 Skin sparing mastectomy facilitates reconstruction of the breast in a

more natural way with little change in the color of the skin and symmetry, thereby achieving a more desirable aesthetic result however the reconstruction of nipple and areola complex is still a great challenge.

Gerber et al were the first to describe the preservation of the nipple areola complex, so called nipple sparing mastectomy.5 Nipple-areola complex preservation is the optimal cosmetic outcome in breast cancer treatment, however, achieving this outcome using nipple areola skin sparing mastectomy raises the concerns regarding the oncological safety and the risk of recurrence. The risk of tumor involvement of nipple areola complex is thought to be overestimated. Few studies have reported on the oncologic safety and complications associated with nipple areola skin sparing mastectomy.<sup>(6)</sup> Our study was designed to evaluate the oncological safety of Nipple Areola Skin Sparing Mastectomy (NASSM) in the Egyptian.

## PATIENTS AND METHODS

From January 2010 to December 2010, a total of 64 females with operable breast cancer stage I to IIIa were treated by modified radical mastectomy. All patients have signed an informed consent approved by Esthetic Committee of Alexandria Faculty Teaching Hospital. All Patients had normal shape, color of areola & nipple with no signs of skin involvement. All patients were either contraindicated or refused breast conservative surgery. Patients who were received previous chemotherapy were excluded from this study as well as patients with inflammatory breast cancer. Standard modified radical mastectomy was performed to all the patients, removing all breast tissue, the nipple-areola complex, necessary skin, and total axillary lymph nodes.

Breast specimen was examined by standard hematoxylin and eosin stains under light microscopy. Tissue just underlying nipple areola complex were examined for evidence of malignancy. All specimens were examined by a single expert pathologist to search for malignancy in the subareolar tissue.

SPSS for windows, version 11.0 (SPSS Inc., Chicago) was used for statistical analyses. Patients' demographics, clinical and pathological characteristics of the tumor were recorded and compared between groups using  $\chi^2$  test and Fisher exact test wherever appropriate. A P > 0.05 was considered to indicate a significant difference.

#### RESULTS

64 patients were included in this study. Patients' age ranged from 32 to 74 year old, 53 cases (82.8%) were post-menopausal. The size of tumors was ranged from 2.2 to 7.1 cm with mean size of 3.2 cm. Distance between the areola and nearest point of the tumor ranged from 4.9 to 12.1 cm.

Table 1. Clinical Characteristics.

	Number
Age (yr)	
Mean	53.2
Range	32 – 74
Menstrual state	
Pre-menopause	2 (3.1%)
Peri-menopause	9(14%)
Post-menopause	53 (82.8 %)
Breast Size (Bra Size)	
А	6 ( 9.4 % )
В	13 ( 20.3 % )
С	25 ( 39 % )
D	20 ( 31.3 )
Tumor size (cm)	
Mean	3.2
Range	2.2 – 7.1
Distance between nipple and nearest point of tumor (cm)	
Range	4.9 - 12.1

Pathological type of tumors was infiltrating ductal carcinoma (IDC) in 54 cases (%), ductal carcinoma insitu (DCIS) in 11 cases (%), and lobular carcinoma in 2 cases (%). 3 cases had both infiltrating ductal carcinoma and ductal carcinoma in-situ on histopathological examination (%). Grading of tumor is shown in the Table.

#### Table 2. Pathological Characteristics.

	Number	
Tumor Type *		
IDC	54 (84.4 %)	
DCIS	11 ( 17.2 % )	
Lobular	2 (3.13 %)	
Tumor Grade		
А	4	
В	25	
С	26	
D	7	

\*3 cases had both infiltrating ductal carcinoma and ductal carcinoma in-situ.

Of these 64 cases, twelve cases (18.75%) were found to have positive malignant cells in the subareolar tissue. Comparison between the negative and positive groups was done. (Table 3) It revealed no significant difference between them in the age, menstrual state, breast size (using bra size), tumor grade or Axillary lymph nodes state either clinically or histologicaly. However, a significant difference was present in: the type of tumor, its size and the distance between nipple and the nearest point of the tumor. (P < 0.05).

Table 3. Comparison	between the positive	and negative cases.
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Number	Positive	Negative
	12 (19%)	52 (81%)
Age (yr)		
Mean	54.3	52.1
Menstrual state		
Pre-menopause	0	2 ( 3.8 % )
Peri-menopause	2 ( 16.7 % )	7 (13.5 %)
Post-menopause	10 ( 83.3 % )	43 ( 82.7 % )
Breast Size (Bra Size)		
Α	1 (8.3 %)	5 ( 9.6 % )
В	2(16.7%)	11 ( 21.2 % )
C	4 ( 33.3 % )	21 ( 40.4 %)
D	5(41.6%)	15 ( 28.8 % )
Tumor size (cm)		
Mean	6.3	3.2
Range	4.1 – 7.1	2.2 – 5.2
Clinical palpable lymph nodes		
Palpable	7 (58%)	25 (48%)
Not palpable	5 (42%)	27 (52%)
Histological positive lymph nodes		
Positive nodes	3 (25%)	19 (36%)
Negative nodes	9 (75%)	33 (64%)
Distance between nipple and nearest point of tumor (cm)		
Range	4.9 - 5.9	5.3–12.1
Tumor Type *		
IDC	11 (91.6 %)	43 ( 82.7 % )
DCIS	2 (16.7 %)	9 (17.3 %)
Lobular carcinoma	0	2 ( 3.8 % )

Positive predictive value was tumor size >4 cm, distance between tumor and nipple <6 cm ( $\rho$  = 0.05). There were no significance difference between type & grade of tumor with the presence of malignant cells in retro-areolar region.

## DISCUSSION

Oncoplastic surgery has become a key aspect of breast cancer treatment. Such surgery should consider both oncological and cosmetic outcomes. The idea of sparing the skin of the breast is to facilitate the immediate breast reconstruction. In multiple studies, skin sparing mastectomy seems to be oncologically safe in patients with invasive T1, T2 tumors, multicentric tumor, ductal carcinoma in situ or risk reduction. Another study reported on the efficacy of skin sparing mastectomy and showed that the local recurrence was from 0% to 7% which is similar to the local recurrence after modified

### radical mastectomy.

The greatest advantage of nipple areola skin sparing mastectomy compared to skin sparing mastectomy is the immediate cosmetic result with no need for nipple reconstruction later on. The need to remove the nipple areola complex is based on the concern of occult neoplastic involvement. In the past, it was believed that the nipple areola complex and adjacent ducts might harbor tumor cells that could spread distally along the ducts from the primary tumor.<sup>(7-9)</sup> That belief might reflect the results of the older studies, which demonstrated occult tumors in the proximity of the nipple areola complex, and the work of Sappery, who described lymphatic drainage of breast as being centripetal toward the subareolar plexus.(10-13) Later studies showed that lymphatic drainage is also downward to the deep pectoral lymphatic plexus.12,13 Moreover, the risk of tumor involvement from nipple areola complex has been overestimated. Now, attempts are made to preserve the nipple areola complex since the first paper done by Gerber et al in 2003.5 Another study had shown that nipple involvement varies from 0% to 58% depending on the size of the primary breast tumor, distance from the nipple areola complex, multicentricity, lymph node positivity, the presence of an extensive intraductal component.<sup>(14)</sup>

Vlajcic et al suggested that the nipple areola complex could be safely preserved when the tumor size is < 2.5 cm and the tumor to nipple distance is > 4 cm.<sup>(15)</sup>

Sacchini et al excluded patients from nipple areola skin sparing mastectomy if the tumor was < 11 cm from the areola, and reported no recurrence in the nipple areola complex.<sup>(16)</sup> Petit et al expanded the selection criteria for nipple areola skin sparing mastectomy. The cases were followed by intraoperative radiation therapy and immediate reconstruction.<sup>(17)</sup> Benediktsson and Perbeck reported that a NASSM group showed recurrence rates comparable to those of mastectomy patients over a 13-years of follow-up, and their patient population included T1–T3 tumor, multicentricity, and lymph node involvement.<sup>(18)</sup>

To prove the oncological safety of the nipple areola skin sparing mastectomy procedure in the Egyptian females, we searched for the presence of the occult malignant cells in the subareolar tissue in the breast specimens of the standard modified radical mastectomy and searched for factors that may predict the presence of positive malignant cells at that area.

We found that the tumor size and the distance between nipple and nearest point of the tumor were the only predictive pre-operative factors while the age, menstrual state, breast size, tumor type and grade did not directly affect the prediction of presence of subareolar malignant cells.

In conclusion, NASSM appears to be a safe surgical option breast cancer patient, if the tumor size is less than 4 cm, and the distance between the tumor and nipple is more than 6 cm.

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