



A STUDY OF RESIDUAL BREAST TISSUE IN POST MASTECTOMY SKIN FLAP

Dr. Rubal Gangopadhyay

MS General Surgery, Demonstrator, Department of General Surgery, Murshidabad Medical College, Berhampore, State – West Bengal 742101, India.

Dr. Mala Mistri*

MS General Surgery, Associate Professor, Department Of General Surgery, R G Kar Medical College And Hospital, 1, Khudiram Bose Sarani, Kolkata – 700004. – West Bengal, India. *Corresponding Author

Dr. Sukanta Sikdar

MS General Surgery, Faculty, Department Of General Surgery, R G Kar Medical College And Hospital, 1, Khudiram Bose Sarani, Kolkata - 70004, West Bengal, India.

ABSTRACT

Background: The objective of any mastectomy is to rid the chest wall of any breast tissue but since the breast being un-encapsulated, there is every chance that some amount of breast tissue may be left behind in the skin flaps after resection. As the remnant breast tissue is likely to be exposed to the same carcinogenic risk factors as the tissue removed. Hence, there is always a possibility that the residual tissue may become the seat of a recurrence. **Objective:** To get rid the chest wall so far the residual breast tissue will be minimal and the recurrence of breast carcinoma will be less. **Data source:** Patents of proven case of CA breast who underwent MRM at RG KAR MEDICAL COLLEGE AND HOSPITAL from July 2016 to June 2018 are included in the study group. **Study design:** This is a prospective study of total 45 patients are selected. **Materials and methods:** Prospective analysis of 45 post MRM women whose mean age is 49.5 years (mean \pm SD age, 49.5 \pm 2.4 years). Tissue specimens taken from central part of four quadrants of two skin flaps for histo-pathological examination. Skin flap thickness measured for more than 8mm. All patients followed for any recurrence of breast carcinoma. **Results:** Of all histo-pathological specimens left sided breast cancer cases were more common than right side. 48-49 years age group had the most number of cases and more than 53 years the least. The lower medial quadrant the most 5(45.45%), upper and lower lateral quadrant 3(27.27%) each for positive and upper medial quadrant negative for breast tissue. Breast carcinoma negative in all specimens. Skin flap necrosis of 2(4.44%) cases. No recurrences noted during my study period. **Conclusion:** My study has demonstrated presence of residual breast tissue in a significant percentage of post mastectomy skin flaps. No residual cancer tissue was found. During the duration of the study, no recurrence of breast carcinoma was detected in patients with residual breast tissue in skin flaps.

KEYWORDS : Breast Carcinoma, Skin Flaps, Residual Breast Tissue, Superficial Fascia, MRM- Modified Radical Mastectomy, Necrosis, Recurrence, CA Breast – Carcinoma Breast.

1. INTRODUCTION:

A rapid increase in the rate of carcinoma breast was reported worldwide following increased awareness regarding self-examination of breast, breast lumps turning out to be breast cancer, regular screening, hereditary causes of breast cancer like BRCA 1 and 2 positivity has led to early surgical consultations and genetic study by patients and relatives. Screening radiological studies like mammography followed by FNAC, Core needle biopsies has led to early detection mastectomies.

Ideally, following any type of mastectomy there should not be any breast tissue in the inner side of skin flaps. However, since breast tissue is not encapsulated^[1,2], unlike the thyroid gland, there are chances that some breast tissue may be left behind on the inner surface of skin flaps^[3], sometimes carcinomatous^[4] tissue too.

In literature, presence of a superficial fascia between subcutaneous fat and breast tissue which separates fibro-fatty tissue and breast parenchyma is mentioned. If the superficial fascia could be identified then skin flaps would be completely free of breast tissue and recurrence of breast carcinoma^[5,6] from residual breast tissue would not be a possibility. In reality, the superficial fascia^[7] is rarely identifiable, and this leads to presence of residual breast tissue or even breast carcinoma in skin flaps. Hence, attempts to achieve breast tissue free post-mastectomy skin flaps by visual estimation leads to severe thinning. Damage of sub-dermal arterial^[8,9] and venous system is noted in skin flap thickness less than 8mm^[10], with ischemia and necrosis is a documented complication. Thus, during any type of mastectomy a balance has to be maintained between leaving residual breast tissue and significant thinning of skin flaps.

In this study, I have attempted to document the incidence of left over breast tissue or if cancer tissue following standard Modified Radical Mastectomies. Followed the patients with an honest intent to detect possible local recurrences of breast cancer if any, albeit over a short period from residual breast tissues.

2. MATERIALS AND METHODS:

Prospective analysis of 45 post Modified Radical Mastectomy women

patients whose mean age is 49.5 years (mean \pm standard [SD] age, 49.5 \pm 2.4 years). Tissue specimens were taken from the central part of the four quadrants of the two post mastectomy skin flaps and histo-pathological examination done. Skin flap thickness was measured by an intra-operative sterile Vernier's caliper at four points of the two skin flaps for thickness of more than 8mm. During the duration of the study, all the patients were immaculately followed up with both clinical and radiological examinations for any recurrence of breast carcinoma. The variables analyzed included presence of breast tissue in post mastectomy skin flaps, quadrant of presence of breast tissue, age, post mastectomy skin flap necrosis and recurrence of breast carcinoma from residual breast tissue during the duration of the study. Statistical analyses are descriptive.

3. RESULTS AND ANALYSIS:

Table 1 - Age Distribution in comparison with side of Breast Carcinoma:

			Age	Category		Total	
			46-48	49-50	51-53	>53	
Breast	Left	Count	13	09	08	02	32
		% within age category	72.2	81.8	57.1	100.00	71.1
	Right	Count	05	02	06	00	13
		% within age category	27.8	17.2	42.9	00	28.9
Total		Count	18	11	14	02	45
		% within age category	100	100	100	100	100

Cases of breast cancer were more common on the left side in any age group. The age group of 48-49 years had the most number of cases and more than 53 years had the least number of cases.

The frequency of carcinoma breast 71.1% (32/45) patients in Left breast. Whereas in 28.95% (13/45) patient in Right breast.

Breast:

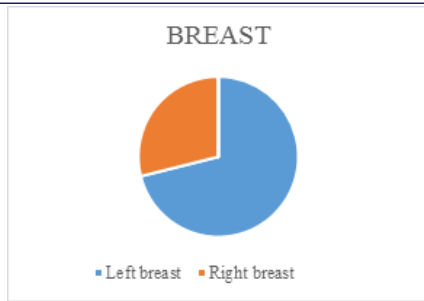


Figure 1 -Left sided breast cancer cases were more common than right side cases.

Upper Medial:

No tissue specimens present on either side.

Upper Lateral: Only 03 specimen out of 45 patients 6.7% (03/45) involved in upper lateral quadrant of breast, rest 42 specimen 93.3% (42/45) are not affected.

From either side, 3 or 6.7% tissue specimen came positive for breast tissue out of total 45 cases.

Lower Medial: 40 tissue specimen of lower medial quadrant 40/45(88.9%) negative for tissue specimen From either side, 5 or 11.1% tissue specimen came positive for breast tissue out of 45 cases.

Lower Lateral: Similarly 42 specimen of lower lateral quadrant of breast 42/45negative for tissue specimen. From either side, 3 or 6.7% tissue specimen came positive for breast tissue out of total 45 cases.

The lower medial quadrant the most 5(11.10%), upper and lower lateral quadrant 3(6.70%) each for positive and upper medial quadrant negative for breast tissue. Hence, residual breast tissue was found in 11(24.44%) of total 45 cases. Breast carcinoma negative in all specimens.

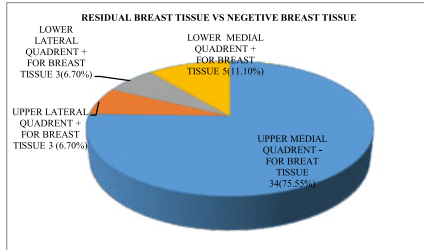


Figure 2- Residual breast tissue (UL+LL+LM) Quadrant VS negative breast tissue (UM) Quadrant.

4. Follow-up

On post-operative follow up of cases, only 2(4.44%) came positive and 43/45 (95.60%) are negative. There were no cases of recurrence of breast carcinoma.

5. DISCUSSION:

The aim of the present study was to record the incidence of residual breast tissue in skin flaps after Modified Radical Mastectomy and compare the same findings of other researchers. The secondary aims were to review the available literature on its clinical implications and observe, if possible, whether it had any impact on recurrence of malignancy.

In my study breast cancer was more common on left side 32(71.1%). Similarly, Tulinus H. et al [11], in their study of unilateral cases, the ratio of left to right was 1.13, or 13% excess of unilateral breast cancer cases in the left breast over the right.

Residual breast tissue was found in 11(24.44%) of total 45 cases. In 1940, Hickenet. al⁶, conducted the first study to investigate the amount of glandular tissue left in situ after a conventional total mastectomy after the authors' curiosity had been triggered by two cases of women who developed breast cancer and mastitis of residual axillary breast tissue 15 and 10 years, respectively, after an ipsilateral mastectomy for a benign indication.

In a study conducted by Tewari M. et al³, in total 37 patients of breast cancer undergoing Modified Radical Mastectomy were examined. From under the post mastectomy skin flaps, biopsies were taken from the central point of 4 quadrants (upper outer, upper inner, lower inner and lower outer), 3 cm from cut margin of skin to examine for presence of residual breast tissue. They found the area where residual breast tissue is likely to be left, is under the skin. Of the 37 patients, in 8(21.6%) cases, residual breast tissue was found under the skin flap. In my study, tissue specimen were taken from the central part of the four quadrants of the two post mastectomy skin flaps and residual breast tissue detected in 11(24.44%) cases.

I have measured intra-operative post mastectomy skin flaps with sterile Vernier's calipers whereas Giannotti D. G. et al⁵, have used breast magnetic resonance imaging (MRI) to evaluate the frequency of residual breast tissue and provide average measurements of thickness of skin flaps in patients with mastectomy.

In my study, the lower medial quadrant was prone to harbor positive residual tissue of 5(11.10%) samples, upper and lower quadrants each 3(6.70%) samples and rest negative. On the contrary, Griepsmaet al [12], in 2013, studied the superficial dissection planes of 206 mostly total mastectomy cases obtaining 36 specimens from standardized locations. In 76% of mastectomies, one or more biopsies contained glandular tissue at the resection plane. Areas of predilection were the lower outer (lateral) quadrant, 15% positive biopsies.

Skin thickness of 8mm or more were attempted with necrosis occurred in 2 out of 45 cases. Frey J. D. et al¹⁰ in their study concluded that ischemic complications after Nipple Sparing Mastectomy (NSM) are significantly associated with thinner post-operative NSM flap thickness less than 8mm.

Robertson S. et al⁸ in their study, have suggested that the use of diathermy rather than scalpel dissection may increase the mastectomy skin flap necrosis rate. They also stated that neo-adjuvant therapy may help downsize tumors that are close to the skin, or adjuvant chest wall radiotherapy may be utilized for close resection margins, which might help avoid the need for overly thin skin flaps. In the cases included in my study, diathermy was used to dissect breast parenchyma from skin flaps.

Timbrell S. et al [13], stated that rates of loco-regional recurrence (LRR) after modified radical mastectomy performed for pure Ductal carcinoma in-situ (DCIS) are historically reported as 1%. They undertook a retrospective review of all patients who underwent a mastectomy for pure DCIS at their institution between 2000 and 2010. In total, 199 patients underwent mastectomy for pure DCIS associated with a 5-year LRR of 0% in the modified radical mastectomy group. In my study, there were no instances of recurrence of breast cancer. May be, my study group was small or duration of my study is not sufficient enough for instances of recurrence of breast cancer.

Many variables in my study vary with other studies. Shorter duration or lesser number of cases may be a reason.

6. CONCLUSION:

All forms of mastectomy leave residual breast tissue in post mastectomy skin flaps. My study has demonstrated presence of residual breast tissue in a significant percentage of post mastectomy skin flaps. Residual cancer tissue was not found in any specimen. The patients who had residual breast tissue in post mastectomy skin flaps were followed and regularly examined for recurrence of breast carcinoma but no recurrence was detected. However, in view of the incidence of residual breast tissue, it may be suggested that, knowledge of the extent of the remaining breast tissue is important for guiding additional surveillance and formulating certain protocols to detect recurrence of breast carcinoma, if any. Surgical techniques should be improved and newer techniques should be adopted in the future so that residual breast tissue does not remain in post mastectomy skin flaps.

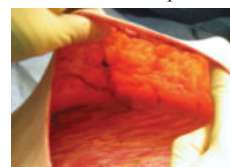


Figure 3-Post mastectomy skin flap.



Figure 4- Post mastectomy chest wall.



Figure 5- Post mastectomy skin flap necrosis.

7. Author's contribution: PLC conceived the study and did the literature search, coordinated the write-up, editing and submission of the article. ESK and MM participated in the writing of the manuscript and editing. All the authors read and approved the final manuscript.

8. Conflicts of interests: There is no conflict of interest, and. All authors are in agreement with the manuscript. The publication has not been published before and is not under consideration elsewhere.

9. The disclosure statements: I hereby declare that submission of work requires that the piece to be reviewed has not been previously published. I have the following nonexclusive rights: (1) to use the manuscript in the Author's teaching activities; (2) to publish the manuscript, or permit its publication, as part of any book the Author may write; (3) to include the manuscript in the Author's own personal or departmental (but not institutional) database or on-line site; and (4) to license reprints of the manuscript to third persons for educational photocopying. These exclusive rights run the full term of the copyright, and all renewals and extensions thereof. I hereby accept the terms of the author agreement.

10. REFERENCES :

1. William John Krause: The Art of Examining and Interpreting Histologic Preparations: A Laboratory Manual and Study Guide for Histology; Second Edition, Columbia, USA.
2. Joseph Krafka: A Text Book of Histology; First Edition, Bailliere Tindall & Cox, 1936, London, UK.
3. Tewari M, Kumar K, Kumar M, Shukla HS, Residual breast tissue in the skinflaps after Patey mastectomy. In: Indian J Med Res. 2004 May; 119 (5):195-7.
4. Andry G, Suci S, Vico P, Faverly D, Andry-Hoof M, Verhest A, Nogaret JM, Matthei W: European Journal of Surgical Oncology: the Journal of the European Society of Surgical Oncology and the British Association of Surgical Oncology; 01 Dec 1989, 15(6):476-485.
5. Giannotti D. G. et. al; Analysis of Skin Flap Thickness and Residual Breast Tissue After Mastectomy; Int J Radiat Oncol Biol Phys. 2018 Sep 1; 102(1):82-91.
6. Victorien M.T. van Verschueret. al; Oncological safety of prophylactic breast surgery: skin-sparing and nipple-sparing versus total mastectomy; Dec 17, 2014.
7. Beer G. M., Varga Z, Budi S, Seifert B, Meyer VE, In: Cancer, 2002 March 15; 94 (6):1619-1.
8. Robertson S, Jeevaratnam J, Agrawal A, & Cutress R (2017). Mastectomy skin flap necrosis: challenges and solutions. Breast Cancer: Targets and Therapy, Volume 9, 141-152.
9. M. J. Timmons; Landmarks in the anatomical study of the blood supply of the skin; British Journal of Plastic Surgery (1985) 38, 197-207.
10. Jordan D. Frey et al; Mastectomy Flap Thickness and Complications in Nipple-Sparing Mastectomy: Objective Evaluation using Magnetic Resonance Imaging; Plast Reconstr Surg Glob Open. 2017 Aug; 5(8): e1439.
11. Tulinius H., Sigvaldason H., & Ólafsdóttir G. (1990). Left and Right Sided Breast Cancer. Pathology - Research and Practice, 186(1), 92-94.
12. Rachel L. O'Connell and Jennifer E. Rusby; Anatomy relevant to conservative mastectomy; Gland Surg. 2015 Dec; 4(6): 476-483.
13. Simon Timbrell, Sarah Al-Himdani, Oliver Shaw, Kian Tan, Julie Morris, Nigel Bundred; Comparison of Local Recurrence after Simple and Skin-Sparing Mastectomy Performed in Patients with Ductal Carcinoma in Situ; Annals of Surgical Oncology, April 2017, Volume 24, Issue 4, pg. 1071-1076.