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Original Research Paper

General Surgery

A PROSPECTIVE STUDY OF POST MASTECTOMY SKIN FLAP ANCHORING AND SEROMA MONITORING

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ABSTRACT

Background: Breast cancer is the leading cancer which afflicts females globally. In order to decrease the incidence of post-operative complications, skin flap anchoring has been proposed by different authorities. The present study was conducted to assess and compare the outcomes of skin flap anchoring with standard wound closure techniques in the reduction of seroma formation in cases operated for invasive breast cancer. **Materials & Methods:** This prospective observational study (duration: from Feb 2021 to July 2022) conducted on 50 invasive breast cancer patients in the department of surgery in our institute. Informed consent was taken and then, patients were divided in two groups of 25 patients each. Group A underwent MRM with skin flap anchoring and group B underwent MRM with standard closure of the skin flaps at the surgical wound edges. The patients were followed up for post-operative complications. The results were then analyzed.**Results:** In the present study, the mean age of patients in group A and group B were 53.24 ± 7.45 years and 52.04 ± 6.83 years, respectively (non-significant; p-value 0.556). The mean drain volume in group A and group B were 61.96±16.38 mL and 83.17±15.67 mL, respectively. (Significant; p-value <0.001). The mean duration of surgery was 2.06 ± 0.17 hours in group A, while in the group B, it was 2.18 ± 0.32 hours (non-significant; p-value 0.104). The mean duration of use of tube drainage was 4.24 ± 0.44 days in group A, while in the group B, it was 6.4 ± 1.08 days (Significant; p-value <0.001). In group A, the mean length of hospital stay was 4.24 ± 0.44 days, while in the group B, it was 6.4 ± 1.08 days (Significant; p-value <0.001). In group A, the mean seroma aspiration volume was 1.4 ± 3.96 mL, while in the group B, it was 3.4 ± 5.72 mL (non-significant; p-value 0.158). Surgical site infection was present in 4% patients of group A, and 8% patients of group B (non-significant; p-value 0.552). Flap necrosis was present in 4% patients in both the groups (non-significant; p-value 1.00). **Conclusion:** While modified radical mastectomy with skin flap anchoring was found to better while considering drain volume, duration of use of tube drainage, and length of hospital stay. The modified radical mastectomy with skin flap anchoring was comparable to MRM with standard closure of the skin flaps in terms of duration of surgery, seroma aspiration volume, and post-operative complications (surgical site infection and flap necrosis).

KEYWORDS : Invasive breast cancer, Modified radical mastectomy, Flap anchoring technique, Seroma, Flap necrosis

Introduction

Breast cancer is one of the global leading causes of cancer related morbidity and mortality amongst women.[1] About 2.3 million women with breast cancer were reported in the year 2020, out of which 6,85,000 died. Breast cancer carries the maximum disability-adjusted loss of life years (DALYs) among women population than any other disease.[1,2] The management of invasive breast cancer includes a multi-pronged approach, constituting surgical resection (mastectomy in its varied forms), systemic therapies, hormonal therapy, radiotherapy and immunotherapy. It has improved the disease-free period and survival outcomes significantly. In locally advanced breast cancer, surgical treatment continues to be an important tool in the armamentarium.[3] The local post-operative complications such as wound infections, flap necrosis, and formation of wound seromas are relatively common amongst others.[4] Several techniques have been reported to prevent or reduce seroma formation. One such technique is Flap fixation technique or quilting which aims to depreciate the post-mastectomy dead space by fixing the mastectomy flaps to the underlying pectoralis fascia using fine absorbable sutures.[5] The present study was conducted to assess and compare the outcomes of skin flap anchoring technique in the reduction of seroma formation with standard wound closure techniques following MRM.

Materials and methods

This prospective interventional study was conducted on 50 patients in the Department of General Surgery of our institute for a period of 1.5 years. The approval of the institutional ethics committee was taken for the study protocol and the patients were enrolled in the study after written informed consent.

Inclusion criteria-

- Patients attending the General Surgery OPD who was diagnosed with Invasive Breast cancer (Stage I, II, and III).
- Age From 16-70 years females.
- Participants who gave voluntary written informed consent.

Exclusion criteria-

- Patients unfit for surgery.
- Patients with advanced disease (Stage IV breast cancer).
- Patients who were less than 16 and more than 70 years.

The patients were randomized to two groups of 25 each–
Group A: Patients undergoing MRM with skin flap anchoring
Group B: Patients undergoing MRM with standard closure of the skin flaps.

Post-operatively, the patients were observed for seroma formation and related parameters (frequency, duration and volume of aspirations), the drain output volumes, duration of requirement of tube drainage (assessed as drainage less than 30 mL serous fluid for two consecutive days), incidence of surgical site infection, dehiscence and/or flap necrosis alongside the length of hospital stay.

The results of observations of individual groups were pooled and analyzed using SPSS software version 20.0 Chicago, Illinois, USA.

Results

In the present study, the mean age of patients in group A and group B were 53.24 ± 7.45 years and 52.04 ± 6.83 years, respectively (non-significant; p-value 0.556).

The mean drain volume was 61.96±16.38 mL in group A, while in the group B, it was 83.17±15.67 mL. (Significant; p-value <0.001). The mean duration of surgery was 2.06 ± 0.17 hours in group A, while in the group B, it was 2.18 ± 0.32 hours (non-significant; p-value 0.104). The mean duration of use of tube drainage was 4.24 ± 0.44 days in group A, while in the group B, it was 6.4 ± 1.08 days (Significant; p-value <0.001). In group A, the mean length of hospital stay was 4.24 ± 0.44 days, while in the group B, it was 6.4 ± 1.08 days (Significant; p-value <0.001).

In group A, the mean seroma aspiration volume was 1.4 ± 3.96 mL, while in the group B, it was 3.4 ± 5.72 mL (non-significant; p-value 0.158). In both the groups, majority of the patients did not require seroma aspiration over 6 months (group A 88% vs group B 72%). Seroma aspiration once in 6 months was done in 12% patients in group A and 24% patients in group B. Seroma aspiration twice in 6 months was done in none of patients in group A and 4% patients in group B. The statistical difference between the groups was non-significant (p-value 0.131). Surgical site infection was present in 4% patients of group A, and 8% patients of group B (non-significant; p-value 0.552). Flap necrosis was present in 4% patients in both the groups (non-significant; p-value 1.00).

Table 1: Operative findings

	Group A	Group B	P-value
Mean drain volume (mL)	61.96 ± 16.38	83.17 ± 15.67	<0.001 (S)
Mean duration of surgery (hours)	2.06 ± 0.17	2.18 ± 0.32	0.104 (NS)
Duration of use of tube drainage (days)	4.24 ± 0.44	6.4 ± 1.08	<0.001 (S)
Length of hospital stay (days)	4.24 ± 0.44	6.4 ± 1.08	<0.001 (S)

Figure 1: Mean drain volume in groups

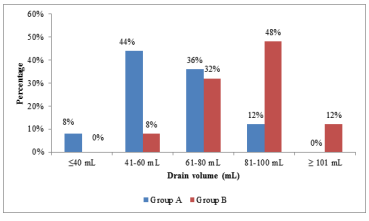

Table 2: Post-operative complications

	Group A	Group B	P-value
Seroma aspiration volume (mL)	1.4 ± 3.96	3.4 ± 5.72	0.158 (NS)
Surgical site infection	4%	8%	0.552 (NS)
Flap necrosis	4%	4%	1.00 (NS)

Discussion

Baseline characteristics of patients: The mean age of patients in group A and group B were 53.24 ± 7.45 years and 52.04 ± 6.83 years, respectively. The difference between the mean age of the groups was non-significant (p-value 0.556). Bastelaar JV et al (2016) reported that mean age of patients in flap fixation group and control groups were 67±13 years and 71±11 years, respectively (p= 0.07).[6] Late age of diagnosis in Indian patients is explained by high proportion of women presenting with late-stage disease at diagnosis (due to lack of awareness regarding the warning symptoms of breast cancer among Indian women), and lack of adequate diagnosis and treatment facilities leading to delays in diagnosis.[8]

Operative findings: The mean drain volume was 61.96±16.38 mL in group A, while in the group B, it was 83.17±15.67 mL. (Significant; p-value <0.001). The mean duration of surgery was 2.06 ± 0.17 hours in group A, while in the group B, it was 2.18 ± 0.32 hours (non-significant; p-value 0.104). The mean duration of use of tube drainage was 4.24 ± 0.44 days in group A, while in the group B, it was 6.4 ± 1.08 days (Significant; p-value <0.001). In group A, the mean length of hospital stay was 4.24 ± 0.44 days, while in the group B, it was 6.4 ± 1.08 days (Significant; p-value <0.001). Khater A et al (2015) also reported a smaller volume of drainage in the intervention group than the control group (710 mL versus 1160 mL, P < 0.001) compared with the control group. The operative time was prolonged in the flap fixation group by around 20 minutes [flap fixation group 127±10.5 minutes [90–160] vs control group 105±7.5 minutes [80–139] (P < 0.001). The average number of days till seroma disappearance were smaller in the intervention group compared with the control groups (2.3 versus 10 days, respectively, P < 0.001).[7] Arafa AS et al (2019) reported that the mean operative time was 146 (80–160) minutes in the quilting group and 100 (70–135) minutes in the control group. The statistical difference between the groups was significant (p-value < 0.001).[8]

Studies	Mean duration of surgery of flap fixation group	Mean duration of surgery of control group
Present study	2.06 ± 0.17 hours	2.18 ± 0.32 hours
Arafa AS et al (2019)	146 (80–160) minutes	100 (70–135) minutes
Khater A et al (2015)	127±10.5 minutes	105±7.5 minutes

The reduction of the dead space after mastectomy using flap fixation reduces seroma formation and seroma aspirations. For many decades, breast surgeons have used closed suction drainage to reduce dead space. However, seroma formation and its sequelae continued to cause postoperative problems in these patients, proving that wound drainage is insufficient in combating seroma. Flap fixation combined with low suction drainage significantly reduces seroma formation and the need for seroma aspiration after mastectomy.[6]

Surgical site infection was present in 4% patients of group A, and 8% patients of group B (non-significant; p-value 0.552). Flap necrosis was present in 4% patients in both the groups (non-significant; p-value 1.00). Arafa AS et al (2019) reported that surgical site infection was detected in 11.6% in the quilting group comparable to the non-quilting group (17.4%) (P<0.333). Flap necrosis was detected in 7.2% in the quilting group comparable to the non-quilting group (10.1%) (P<0.546).[8] Bastelaar JV et al (2016) reported that there was no significant difference in patients developing SSIs (12.0 % in the flap fixation group and 17.0 % in the control group, p = 0.33).[6]

Conclusion

The present study found that in terms of operation time, seroma aspiration volume, and post-operative complications, modified radical mastectomy with skin flap anchoring was comparable to MRM with standard closure of the skin flaps (surgical site infection and flap necrosis). Modified radical mastectomy with skin flap anchoring was determined to be superior when drain volume, tube drainage time, and hospital stay were taken into account.

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REFERENCES

1. Becker S. A historic and scientific review of breast cancer: The next global healthcare challenge. International Journal of Gynecology & Obstetrics. 2015 Oct;131:S36-9.
2. Breast cancer. World Health Organization (WHO). [updated 26 March 2021; cited 03 Mar 2023]. Available at: https://www.who.int/news-room/fact-sheets/detail/breast-cancer
3. Almond LM, Khodaverdi L, Kumar B, Coveney EC. Flap Anchoring Following Primary Breast Cancer Surgery Facilitates Early Hospital Discharge and Reduces Costs. Breast Care (Basel). 2010;5(2):97–101.
4. Tartter PI, Beck G, Fuchs K. Determinants of hospital stay after modified radical mastectomy. Am J Surg. 1994 Oct;168(4):320–4.
5. Mannu GS, Qurihi K, Carey F, Ahmad MA, Hussien M. Quilting after mastectomy significantly reduces seroma formation. South African Journal of Surgery. 2015 Nov 3;53(2):50-4.
6. Bastelaar JV, Beckers A, Snoeijs M, Beets G, Vissers Y. Flap fixation reduces seroma in patients undergoing mastectomy: a significant implication for clinical practice. World Journal of Surgical Oncology. 2016;14(1):1–5.
7. Khater A, Elnahas W, Roshdy S, Farouk O, Senbel A, Fathi A, et al. Evaluation of the Quilting Technique for Reduction of Postmastectomy Seroma: A Randomized Controlled Study. Int J Breast Cancer. 2015;2015:287398.
8. Arafa AS, Fayek F, Awad JR. Efficacy of mastectomy flap fixation in minimizing seroma formation after breast cancer surgery. The Egyptian Journal of Surgery. 2019 Oct 1;38(4):656-61.
9. Najeeb E, Rashid R, Zaffar S. Effect of Flap Fixation Technique in Modified Radical Mastectomy on Incidence of Postoperative Seroma Formation. J Coll Physicians Surg Pak. 2019 May;29(5):410–3.