



A COMPARATIVE STUDY BETWEEN MASTECTOMY FLAP QUILTING SUTURES WITH CONVENTIONAL SUTURES IN REDUCING POST-MODIFIED RADICAL MASTECTOMY SEROMA FORMATION

General Surgery

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ABSTRACT

This comparative study investigates the effectiveness of quilting sutures versus conventional sutures in reducing seroma formation after modified radical mastectomy (MRM). Seroma, a common postoperative complication, results from the accumulation of serous fluid in the dead space left after surgery, affecting up to 40% of patients. Conventional sutures often require the use of suction drains to manage this issue, but drains can lead to discomfort, infections, and prolonged recovery times. Quilting sutures, which attach the skin flap to the underlying muscle, offer a promising alternative by reducing dead space and potentially minimizing the need for drainage. The study was conducted on 28 patients undergoing MRM at Bangalore Medical College and Research Institute. These patients were divided equally between those receiving conventional sutures and those with quilting sutures. The results showed that the quilting suture group experienced significantly lower drainage volumes, shorter durations of drain placement, and a markedly reduced incidence of seroma formation compared to the conventional suture group. Specifically, only 7.4% of patients in the quilting suture group developed seromas, compared to 28.5% in the conventional suture group. The study also highlighted a significant reduction in the total aspirated volume in the quilting group. The benefits of quilting sutures extended beyond clinical outcomes, offering potential cost savings by reducing hospital visits and need for postoperative interventions. Although the study's small sample size may limit generalizability, the findings suggest that quilting sutures offer a more effective and efficient method for managing post-MRM complications. Further research is needed to confirm these results and explore the long-term benefits of this technique. Overall, quilting sutures may represent an important advancement in surgical techniques for MRM, improving patient recovery and reducing healthcare costs.

KEYWORDS

Modified radical mastectomy, seroma formation, quilting sutures, conventional sutures, drain volume, postoperative recovery.

INTRODUCTION

Seroma formation is one of the most common complications following modified radical mastectomy (MRM), occurring in a significant percentage of patients. Defined as a localized accumulation of serous fluid in the surgical dead space created during the procedure, seromas can lead to discomfort, prolonged recovery times, and increased healthcare costs due to repeated hospital visits for aspiration or drainage. The reported incidence of seroma formation after mastectomy ranges from 25% to 40%, highlighting the need for effective strategies to minimize this complication. As the management of seromas is critical to improving patient outcomes and quality of life, there is an ongoing exploration of surgical techniques that can mitigate their formation [1,2].

Several factors contribute to the development of seromas post-surgery, including the extent of tissue trauma, lymphatic disruption, and the presence of dead space created by the surgical technique. When lymphatic vessels are disrupted during surgery, lymph fluid can accumulate in the dead space, leading to seroma formation. Conventional suturing techniques often fail to address this issue effectively, resulting in the retention of fluid in the surgical site. Traditionally, surgeons have relied on suction drains to manage seromas; however, the use of drains is not without complications. These can include infections, patient discomfort, and prolonged hospital stays due to the need for drainage [3,4].

The aim of this study is to conduct a comparative analysis of the effectiveness of quilting sutures versus conventional sutures in reducing postoperative seroma formation after modified radical mastectomy. By evaluating the outcomes of patients who receive quilting sutures in comparison to those who receive traditional sutures, we hope to determine whether the quilting technique can significantly improve postoperative recovery and patient comfort [5,6].

In the context of this research, it is essential to consider the implications of seroma formation beyond the immediate physical discomfort experienced by patients. Seromas can lead to a cascade of complications that can affect the patient's overall recovery trajectory. The need for multiple aspirations or prolonged drainage can delay the return to normal activities and result in additional medical expenses. Furthermore, the psychological impact of surgical complications can significantly affect a patient's quality of life. Patients who experience complications may suffer from increased anxiety and a diminished

sense of well-being, which can further hinder their recovery [7].

In addition to the clinical implications, understanding the potential benefits of the quilting suture technique from a cost-effectiveness perspective is vital. If the use of quilting sutures can effectively reduce the incidence of seromas, it may lead to fewer hospital visits, decreased need for additional procedures, and ultimately lower healthcare costs for patients and the healthcare system. This research may provide evidence supporting a shift toward adopting quilting sutures as a standard practice in mastectomy surgeries, with the potential for widespread implications for surgical oncology [8].

The comparative study design allows for a robust evaluation of the effectiveness of the two techniques. By including a well-defined population of patients undergoing modified radical mastectomy, we aim to control for confounding factors that may influence seroma formation. Participants will be carefully selected based on established inclusion and exclusion criteria to ensure that the results are generalizable to the larger population of patients undergoing this procedure [9,10].

Data will be collected on several key outcome measures, including the total volume of drainage, duration of drain placement, and the incidence of seroma formation in both groups. Statistical analysis will be performed to determine whether there are significant differences in these outcomes between the quilting suture and conventional suture groups. By rigorously analyzing these data, we aim to provide clear and evidence-based recommendations for clinical practice [10,11].

This study seeks to fill a critical gap in the literature regarding the effectiveness of quilting sutures in reducing postoperative seroma formation after modified radical mastectomy. Given the prevalence and impact of seromas on patient recovery and quality of life, identifying effective surgical techniques to mitigate this complication is of paramount importance. The outcomes of this study may contribute to advancing surgical practices, enhancing patient care, and ultimately improving the overall experience of individuals undergoing modified radical mastectomy. As we embark on this investigation, we are hopeful that our findings will provide compelling evidence supporting the adoption of quilting sutures as a standard technique in the management of post-mastectomy complications [12,13].

Aims And Objective

To assess the efficacy of quilting technique closure of mastectomy flaps in reducing post operative seroma formation versus conventional suturing

MATERIAL AND METHODS

This comparative study was conducted at the Department of General Surgery Bangalore Medical College and Research. Ethical approval has been obtained from the Ethical Approval Committee of Bangalore Medical College and Research, Bangalore.

Study Population

The study population consisted of 28 patients undergoing modified radical mastectomy at hospitals affiliated with BMCRI, divided into two groups: 14 patients receiving quilting sutures and 14 receiving conventional sutures. All patients were willing to provide informed consent. Exclusion criteria included prior chemotherapy, breast irradiation, or previous breast surgery. A suction drain was placed in both groups.

Data Analysis

Data analysis involved following patients throughout their hospital stay to measure the total volume of drainage before removal and the duration of drain placement in days. Seroma was assessed clinically, with occurrences recorded based on the number of aspirations and the total aspirated volume. This information was critical for evaluating the effectiveness of the suturing techniques.

RESULTS

The age distribution of participants showed that out of the total patients, 1 (4%) were aged 30-40 years, 13 (46%) were between 41-50 years, 11 (39%) fell within the 51-60 year range, and 3 (11%) were aged 61-70 years. This data indicates a notable predominance of patients in the 41-50 and 51-60 year age groups, emphasizing that the majority of the study population was concentrated in these age brackets.

Table 1: Drain output in CONTROL GROUP on POD 1, POD 2 and POD 3

Drain output (ml)	Mean	Standard deviation
POD 1	194.64	79.9
POD 2	144.64	45.2
POD 3	103.57	44.7

Table 2: Drain output in INTERVENTION GROUP on POD 1, POD 2 and POD 3

Drain output (ml)	Mean	Standard deviation
POD 1	92.14	35.1
POD 2	59.29	30.3
POD 3	38.9	28.7

Table 3: Comparison of drain output on POD 1, POD2 and POD 3 between control and intervention groups (p value: <0.0001)

Total drain output (ml)	Mean	Standard deviation
Control	533.93	170.86
Intervention	209.64	102.17

Table 4: Comparison of total duration of drain placement

Duration before drain removal (days)	Mean	Standard deviation
Control	4.64	1.08
Intervention	3.57	0.75

Table 5: Total number of patients that developed seroma

Duration before drain removal (days)	Mean	Standard deviation
Control	4.64	1.08
Intervention	3.57	0.75

Table 6: Total number of aspirations and total volume

Duration before drain removal (days)	Mean	Standard deviation
Control	4.64	1.08
Intervention	3.57	0.75

DISCUSSION

The findings of this study align with existing research that demonstrates quilting sutures can effectively reduce the dead space left

after mastectomy, thereby minimizing the risk of seroma formation. Quilting sutures, which involve anchoring the skin flap to the underlying muscle, play a crucial role in preventing fluid accumulation in the space created during surgery. Previous studies have shown similar results. One such study found that quilting sutures significantly reduced both fluid drainage and the incidence of seromas. This technique helps close off the potential space where seromas typically form, supporting the conclusions drawn in this study. By reducing seroma formation and drainage volume, quilting sutures enhance patient recovery and lower the need for postoperative interventions like fluid aspiration, which can otherwise prolong the recovery period and cause further discomfort for patients [14,15].

The study also reinforces the idea that quilting sutures improve aesthetic outcomes after surgery. In addition to minimizing seromas, quilting sutures ensure better adherence of the skin flap to the underlying tissue, reducing tension on the sutures. This helps achieve more consistent and favorable aesthetic results post-mastectomy. The reduced fluid accumulation also allows for the earlier removal of drains, further contributing to patient comfort and a smoother recovery process [16].

This research is further supported by other studies in the field. A systematic review found that quilting sutures were superior to conventional sutures in preventing seroma formation, particularly in the pectoral area following mastectomy. This growing body of evidence highlights the consistent benefits of quilting sutures in reducing postoperative complications, suggesting that the technique could be widely adopted in surgical practice to improve outcomes for patients undergoing modified radical mastectomy (MRM) [17,18].

In the current study, quilting sutures significantly reduced postoperative seroma formation compared to conventional sutures. Only 7.4% of patients in the quilting group developed seromas, while 28.5% of patients in the control group experienced this complication. Moreover, the total aspirated volume in the quilting group was much lower, with an average of 10 ml compared to 95 ml in the control group. This substantial reduction in fluid accumulation not only minimizes the need for aspirations but also enhances overall patient recovery. The drain output was also significantly lower in the quilting group, with an average of 92.14 ml on the first postoperative day, compared to 194.64 ml in the control group. This pattern continued through subsequent days, confirming the effectiveness of quilting sutures in reducing fluid buildup [19].

Additionally, the duration of drain placement was shorter in the quilting group, with drains being removed after an average of 3.57 days, compared to 4.64 days in the control group. This faster removal of drains further contributes to a more comfortable and quicker recovery for patients, reducing the risk of infection and other complications associated with prolonged drain use. These findings are consistent with prior research that has shown quilting sutures not only reduce seroma formation but also shorten the overall recovery period by decreasing the need for drain management and postoperative interventions [20].

The benefits of quilting sutures extend beyond clinical outcomes, offering potential cost savings by reducing hospital visits and the need for additional medical procedures. By minimizing seroma formation, the quilting technique decreases the frequency of follow-up visits for fluid aspiration, helping to lower healthcare costs for both patients and providers. Furthermore, patients experience less discomfort, fewer complications, and faster recovery, allowing them to return to their normal activities sooner [21].

Despite the promising results of this study, it is important to acknowledge the limitations, including the relatively small sample size of 28 patients. While the findings are statistically significant, larger studies are necessary to confirm the generalizability of these results across a broader population. Future research should also investigate the long-term effects of quilting sutures, particularly in terms of flap viability and other potential complications that may arise in the months following surgery [22].

Quilting sutures represent an effective technique for reducing postoperative seroma formation in patients undergoing MRM. This study, along with supporting evidence from other research, suggests that quilting sutures significantly improve patient outcomes by

reducing drainage volume, minimizing seroma formation, and shortening the duration of drain placement. As a result, quilting sutures enhance recovery, reduce discomfort, and potentially lower healthcare costs [23].

CONCLUSION

Quilting is an effective closure technique for mastectomy flaps that significantly reduces postoperative seroma formation. In addition, it decreases both the total drainage volume and the duration of drain placement, enhancing patient recovery and comfort. By minimizing dead space, quilting sutures help prevent fluid accumulation, making it a valuable technique for improving outcomes in patients undergoing modified radical mastectomy.

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