



Comparison of the Frequency of Wound Infection in Patients Undergoing Toilet Mastectomy Versus Simple Mastectomy in Patients with Fungating Breast Tumor at Tertiary Care Hospital, Karachi

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ABSTRACT

Background: Fungating breast tumors often require palliative surgical intervention. However, the optimal approach for minimizing postoperative wound infection remains unclear. This study compared the frequency of wound infections following toilet mastectomy and simple mastectomy in patients treated at a tertiary care hospital. **Methods:** This randomized controlled trial was conducted in the Department of Surgery at JPMC, Karachi, over a period of six months. We enrolled 68 patients with fungating breast tumors and assigned them to one of two surgical groups. One group was toilet mastectomy (Group A) and the other group was simple mastectomy (Group B). We documented wound infections postoperatively and examined associations with age, education, income, and occupational status. **Results:** Group A had a lower rate of wound infection (14.7%) compared to Group B (41.2%). Although the difference did not reach statistical significance ($p = 0.15$). Patients with lower education levels and those who were employed showed a slightly higher infection rate across both groups, but these patterns were not statistically significant. **Conclusion:** Toilet mastectomy appeared to reduce the frequency of wound infection rates compared to simple mastectomy in patients with fungating breast tumors.

INTRODUCTION

Breast cancer is a widespread health burden affecting women worldwide, with Pakistan reporting the highest incidence rate among all Asian countries¹. One in every nine women is likely to develop this cancer at some point during her lifetime². Furthermore, breast cancer in Pakistan is often diagnosed at a more advanced stage compared to other countries, largely due to the low socioeconomic status of many women, which limits their access to early detection and timely medical care³.

Locally advanced breast cancer, including fungating types, refers to a group of breast cancers that typically appear with significantly large, advanced tumors. These cases often involve regional lymph node enlargement and direct invasion of the chest wall or overlying skin, but without evidence of spread to distant organs⁴. In developing countries, delayed presentation of breast lumps is often attributed to societal and cultural stigmas, limited awareness about the seriousness of such conditions, and financial constraints. As a result, many women do not

pursue medical care until the lump becomes significantly enlarged or progresses to a fungating tumor⁵.

Ulceration and fungation of the tumor often become the tipping point that forces otherwise hesitant patients to finally seek medical care, typically as a last resort⁶. Toilet mastectomy serves as the most effective palliative surgical option for managing these distressing lesions, which are often foul-smelling, infected, ulcerated, visibly disfiguring, and prone to bleeding.⁷ Managing fungating tumors during surgery presents significant challenges for the surgeon, as these lesions are prone to heavy bleeding and may disintegrate easily, increasing the likelihood of surgical site infections⁸. Hence, it becomes essential to develop an effective barrier that can securely cover and isolate the ulcerated tumor surface during surgery. This approach helps reduce the unique intraoperative difficulties faced by the surgeon and enhances the overall success of the palliative resection⁹. Bleeding may be managed through techniques such as embolization or cauterization. Chemotherapy is commonly administered

with the aim of reducing the tumor size and stage prior to further treatment¹⁰⁻¹¹.

Fungating breast tumors are commonly associated with advanced, neglected, or treatment-resistant breast cancer and often present with ulceration, necrosis, and infection. In such cases, toilet mastectomy is performed as a palliative measure to control local symptoms such as bleeding, foul odor, and persistent discharge. However, due to the already contaminated and inflamed surgical field, the risk of postoperative wound infection in toilet mastectomy is presumed to be higher compared to simple mastectomy, which is typically performed under cleaner, elective conditions. Understanding the frequency of wound infections in both procedures is essential for guiding surgical decision-making, improving postoperative care, and optimizing outcomes in patients with fungating breast tumors. This study aims to provide evidence-based insight into the comparative risk of wound infections between toilet and simple mastectomy, thereby assisting clinicians in choosing appropriate surgical strategies and anticipating postoperative complications.

MATERIALS AND METHODS

This randomized controlled trial was conducted in the Department of Surgery at JPMC, Karachi, over a period of six months following the approval of the study synopsis. A total of 68 female patients with fungating breast tumors were included, with 34 patients assigned to each group—Toilet Mastectomy and Simple Mastectomy. The sample size was calculated using the WHO sample size calculator, with a 5% level of significance, 90% power, and anticipated wound infection rates of 13.8% in the toilet mastectomy group and 34.9% in the simple mastectomy group, based on pilot data. A non-probability consecutive sampling technique was used. Female patients aged between 30 and 70 years presenting with a fungating breast mass were eligible for inclusion. Patients were excluded if they had a prior history of chest surgery, abdominal trauma, malignancy, sepsis, or any chronic medical conditions such as congestive heart failure, chronic liver disease, COPD, asthma, myocardial infarction, chronic kidney disease, or stroke.

Ethical approval was obtained from the institutional review board and the College of Physicians and Surgeons Pakistan. Informed written consent was taken from all participants after explaining the purpose, risks, and benefits of the study. Eligible patients were randomly allocated to either the toilet mastectomy or simple mastectomy group using sealed opaque envelopes marked "A" or "B." All surgical procedures were performed under general anesthesia by experienced consultant surgeons with over five years of practice. Postoperatively, patients were followed by the researcher for the development of wound infection according to pre-defined operational criteria.

Data were collected using a structured proforma and analyzed using SPSS version

22. Quantitative variables such as age were assessed for normality using the Kolmogorov-Smirnov test and presented as mean \pm standard deviation or median with interquartile range as appropriate. Categorical variables including residence, income, occupation, education, and

wound infection status were summarized as frequencies and percentages. Comparative analysis of wound infection rates between the two groups was done using the Chi-square or Fisher exact test. To address potential confounding, stratification was performed for age, residence, income, occupation, and education, and post-stratification analysis was carried out using the Chi-square or Fisher exact test, with a p-value \leq 0.05 considered statistically significant.

RESULTS

This study enrolled 68 patients, divided equally into Group A and Group B. The mean age of participants in Group A was 45.8 years (SD = 9.24), while those in Group B had a slightly higher mean age of 47.6 years (SD = 7.41). In both groups, the majority of patients fell within the 30–50 year age range (52.9% in Group A and 55.9% in Group B). Employment status did not differ between the groups; 35.3% of patients in each group were employed, and 64.7% were unemployed. Most participants reported a monthly family income above PKR 75,000, with 61.8% in Group A and 70.6% in Group B reporting higher income levels. Educational attainment varied, though remained broadly similar across both groups. In Group A, 14.7% of patients were illiterate, and 26.5% had higher education. Group B included 20.6% illiterate patients and 23.5% with higher education.

Table 1

Distribution of General Characteristics of the Enrolled Patients

Variables	Group A n (%)	Group B n (%)
Age (years)	45.8 \pm 9.24	47.6 \pm 7.41
Age		
30 to 50 years	18 (52.9)	19 (55.9)
51 to 70 years	16 (47.1)	15 (44.1)
Occupational status		
Employed	12 (35.3)	12 (35.3)
Unemployed	22 (64.7)	22 (64.7)
Family Monthly Income		
\leq 75000	13 (38.2)	10 (29.4)
> 75000	21 (61.8)	24 (70.6)
Educational status		
Illiterate	05 (14.7)	07 (20.6)
Primary	10 (29.4)	12 (35.3)
Secondary	10 (29.4)	07 (20.6)
Higher	09 (26.5)	08 (23.5)

Group B experienced a higher frequency of wound infections compared to Group A. Specifically, 14 patients (41.2%) in Group B developed postoperative wound infections, while only 5 patients (14.7%) in Group A experienced this complication. Although this difference suggests a potential clinical relevance, it did not reach statistical significance ($p=0.15$). Further subgroup analysis explored whether patient characteristics were associated with the risk of wound infection. In Group A, patients aged 30–50 years accounted for 60% of infections, while in Group B, wound infections were nearly evenly distributed between the two age categories. Employed patients showed a higher proportion of wound infections in both groups. In Group A, 4 of 5 infections occurred among employed individuals; in Group B, employed patients represented 50% of those with infections. While a greater share of infections in Group A occurred among patients with a family income of \leq PKR 75,000 (23.1%), the trend reversed in Group B, where infection rates were marginally higher among those earning more than PKR 75,000 (41.7%). Educational

status also appeared to influence wound healing outcomes. Most infections in both groups were concentrated among patients with lower educational attainment, particularly those who were illiterate or had only primary education. Despite these observable patterns, none of the associations between patient characteristics and wound infection reached statistical significance in either group.

Table 2

Distribution of Surgical Outcome of the Enrolled Patient in Group A Versus Group B

Variables	Group A n (%)	Group B n (%)	P-value
Wound infection	Yes	05 (14.7)	0.15
	No	29 (85.3)	

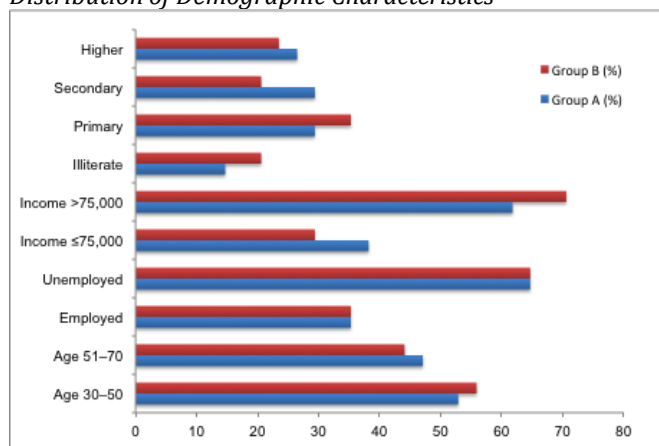
Table 3

Distribution of Patient Characteristics According to the Wound Infection.

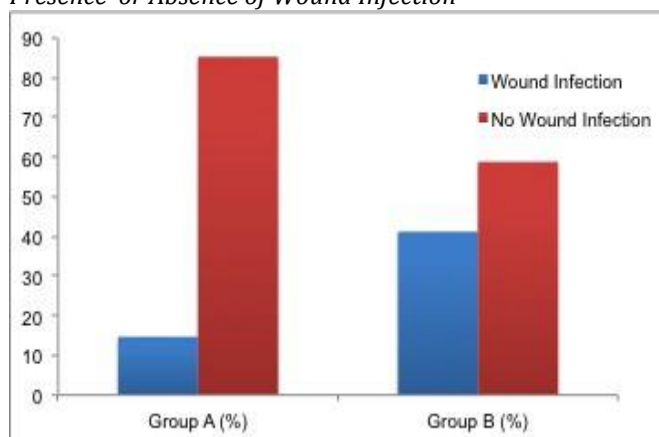
Variables		Wound Infection		P-value
		Group A n (%)	Group B n (%)	
Age	30 to 50 years	03 (16.7)	07 (36.8)	0.70
	51 to 70 years	02 (12.5)	07 (46.7)	
Occupational status	Employed	04 (33.3)	06 (50)	0.15
	Unemployed	01 (4.5)	08 (36.4)	
Family monthly income	≤ 75000	03 (23.1)	04 (40)	0.21
	> 75000	02 (9.5)	10 (41.7)	
Educational status	Illiterate	02 (40)	04 (57.1)	0.56
	Primary	02 (20)	05 (41.7)	
	Secondary	00 (00)	01 (14.3)	
	Higher	01 (11.1)	04 (41.2)	

Figure 1

Distribution of Demographic Characteristics

**Figure 2**

Distribution of Surgical Outcomes—Specifically the Presence or Absence of Wound Infection



DISCUSSION

Group B (simple mastectomy) showed a higher frequency of wound infections (41.2%) compared to Group A (toilet mastectomy, 14.7%). However, this difference did not reach statistical significance. These findings suggest that toilet mastectomy may not inherently carry a higher risk of postoperative infection. This is contrary to what some surgeons might expect due to the extensive tissue debridement involved.

Our results echo findings from previous studies. For instance, Rohith reported a comparable wound complication rate following mastectomy, especially in patients receiving neoadjuvant chemotherapy. In this study careful intraoperative technique and wound care minimized infection risk.¹² Similarly, Nyaoncha et al. observed a 14.5% infection rate in breast cancer surgeries at a tertiary center in Kenya. This reinforced the notion that infection rates can remain manageable even in resource-limited settings when protocols are followed appropriately.¹³

Interestingly, we noted that younger, employed, and less-educated patients experienced slightly higher wound infection rates, although none of these trends reached statistical significance. This observation may reflect disparities in health-seeking behavior, wound care knowledge, or compliance with postoperative instructions, as described in previous studies.¹⁴⁻¹⁵ Flap necrosis and wound dehiscence, common complications in breast surgeries, often occur due to poor vascularity or delayed healing. This is particularly so among patients with comorbidities such as diabetes, obesity, or smoking history.¹⁶⁻¹⁷

Although we did not stratify based on comorbidities, previous research consistently identifies these as independent predictors of poor wound outcomes.

This suggests that patient selection and perioperative optimization are critical.¹⁸

The relatively higher infection rate in simple mastectomy patients may be attributed to incomplete debridement of necrotic or infected tissue. In contrast, toilet mastectomy, although traditionally viewed as a palliative procedure, allows for more aggressive source control. This could explain the lower infection rates observed in Group A. Another study recently documented a similar situation where toilet mastectomy effectively managed necrotizing soft tissue infection.¹⁸ This led to infection resolution and improved quality of life.¹⁸

Our findings also support the idea that the extent of surgical intervention alone does not dictate postoperative risk. Rather, outcomes depend on the context, underlying tissue condition, and intraoperative judgment. Studies have shown that mastectomy followed by immediate reconstruction can sometimes increase complication rates.¹⁹⁻²⁰ However, proper surgical planning and sterile technique significantly reduce this risk.¹⁹⁻²¹

Despite the limitations of our sample size, the trends observed provide valuable insight into surgical decision-making for patients with advanced or fungating breast tumors. Toilet mastectomy, when performed early and appropriately, appears to be a viable option for infection control and may carry a lower risk of wound complications than previously assumed.

Limitations

This study involved a relatively small sample size from a single tertiary care center, which may limit the generalizability of the findings. Additionally, we did not account for clinical factors such as comorbidities or perform microbiological confirmation of wound infections, which could have influenced the accuracy of our outcome assessments.

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CONCLUSION

Toilet mastectomy resulted in fewer postoperative wound infections than simple mastectomy, although the difference did not reach statistical significance. These findings underscore the need for larger, well-designed studies to clarify the optimal surgical approach for patients with fungating breast tumors.