



TO STUDY THE SEROMA FORMATION IN BREAST SURGERY AFTER DRAIN REMOVAL

Kamarthi Venkata Krishna¹, Gostu Chandrasekhar², N Swapnapriya³, Challapalli Srikanth Reddy^{4*}, Meghana Vummanaboina⁵, Karimaddela Keerthinmayee⁶, Madhusudhan Varla⁷, Gollapalli Kavitha⁸

1, 2, 3, 4*, 5, 6, 7, 8 Department of General Surgery, Sri Venkateswara Medical College, Tirupati, Andhra Pradesh, India

***Corresponding Author:** - Challapalli Srikanth Reddy

*Department of General Surgery, Sri Venkateswara Medical College, Tirupati, Andhra Pradesh, India, E-mail:- csrikanth_ms@yahoo.co.in

ABSTRACT

Background: Breast cancer is one of the most common types of cancer. Every year, over a million new cases of breast cancer are diagnosed worldwide. Seroma is the most frequent post-operative complication after breast cancer surgery, developing in approximately 30% of cases. This study aims to assess the effect of early drain removal on seroma formation.

Methods: This prospective study was conducted in the Department of Surgery and Department of Surgical SVRRGGH, Tirupati Hospital from November 2020 to April 2022. 100 consecutive patients who fulfilled the criteria were enrolled to the study after taking complete, written informed consent.

Results: A higher drain output on post-operative day 3 is likely to predict the increased possibility of seroma formation. Factors like age of the patient, BMI, neo-adjuvant chemotherapy, number of lymph nodes removed and the drain removal day have no bearing on seroma rate.

Keywords: Breast carcinoma, seroma, drain removal

INTRODUCTION

Breast cancer is one of the most common types of cancer. Every year, over a million new cases of breast cancer are diagnosed worldwide. It accounts for 30% of all cancers in women and accounts for 16-17% of all cancer-related deaths^[1]

In 1979, the breast cancer consensus development conference declared that the modified radical mastectomy (MRM) was the standard of care for stage i and ii breast cancer. Since Halstead's first mastectomy in 1882, surgeons have faced several problems such as necrosis of skin flaps, wound breakdown, hematoma, seroma, and infection.^[2]

Among them, seroma, a subcutaneous collection of serous fluid, is a common complication in breast cancer surgery. As it usually resolves within a few weeks, Seroma is the most frequent post-operative complication after breast cancer surgery, developing in approximately 30% of cases.^[3]

The incidence of seroma has been shown to correlate with certain factors such as obesity, patient's age, breast size, hypertension, presence of malignant nodes in the axilla, number of dissected nodes, early shoulder exercise, and the use of some drugs, i.e. Tamoxifen and heparin.^[4]

Seroma formation increases the risk of postoperative complications; delays wound healing, increases susceptibility to infection, skin flap necrosis, persistent pain, wound dehiscence, and prolonged convalescence^[5]. To prevent seroma formation, it is very important to predict the individual risk of

seroma formation, i.e., the identification of predictive variables will be helpful in designing future trials aimed at reducing the incidence of this common complication of mastectomy^[6]. However, excessive accumulation will stretch the skin and cause it to sag, resulting in patient discomfort and sometimes prolongation of hospital stay.^[7]

To minimise seroma formation, it is common practise to leave drains open until the drainage volume drops to 20-30ml in the preceding 24 hours^[8]. The presence of a drain can cause a delay in hospital discharge, an increased risk of infection, and a delay in the initiation of adjuvant treatment^[9]. The current study was designed to investigate the effect of early drain removal on seroma formation.

METHODS

This prospective study was conducted in the Department of Surgery SVRRGGH, Tirupati Hospital from November 2020 to April 2022. The ethical clearance was obtained from the Medical Ethical Committee of the institute. 100 consecutive patients who fulfilled the criteria were enrolled to the study after taking complete, written informed consent.

Inclusion Criteria: Female & male patients diagnosed with breast cancer admitted & undergoing surgery in General surgery dept, SVRRGGH, Tirupati, Patients undergoing axillary clearance as part of treatment, Patients giving consent for participation.

Exclusion criteria: Prior surgery in and around axilla, Metastatic carcinoma breast, Patients undergoing simultaneous reconstructive breast surgery.

OPERATIVE TECHNIQUE

All patients underwent a complete clinical examination and relevant investigations required for diagnosis and staging. All participating women were informed about their diagnosis, the surgery to be performed and about the study before the surgery.

A 14 to 16 fr closed suction drain was placed in the axilla. The wounds were dressed with sterile gauze pads. Post-operative drain output over 72 hours, implementation of upper limb (on the side operated) physiotherapy were noted.

During follow-up, wound was inspected, suction drain was eventually removed once the output was <20ml over last 24hrs.

Seroma, defined as subcutaneous collection of serous fluid within the surgical cavity i.e. clinically evident, was diagnosed on clinical examination as soft/boggy swelling in the region of flaps, usually in the axilla, confirmed by wide-bore needle aspiration.

All patients were followed up in the outpatient clinics. Data was collected and recorded Output, cumulative postoperative day 7 drain output, total drain output, duration of drainage.

The primary endpoint of the study was the incidence of seroma formation. The other parameters that were measured were postoperative day 1 drain output, cumulative postoperative day three drain , operative details like; use of electro- cautery, suction drains ,axillary padding were also noted, implementation of upper limb (on the side operated) physiotherapy were noted.

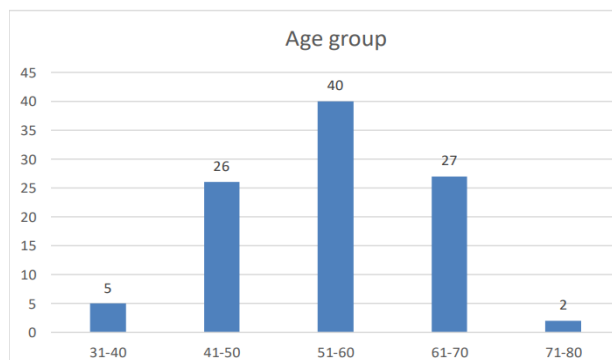
Method of statistical analysis

Descriptive statistical analysis has been carried out in the present study. Results on continuous measurements are presented on mean sd and results on categorical measurements are presented in percentage. (%). Chi-square test has been used to find the significance of study parameters on categorical scale between two groups. Student 't' test has been used to determine the significance between two group means. All analyses were two tailed and p.

RESULTS

Age wise distribution of Study population

In the current study, majority 40% were belongs to 51-60 years age group, next majority 27% were belongs to 61-70 years age group and least common presenting age group was 71-80 (2%)



Association between Age groups and Seroma formation among study population

In the present study, three different age group 41-50 years, 51-60 years, 61-70 years women were had the same percentage of 28.57% seroma formation and only 14.29% of seroma formed women were belongs to 71-80 years age group. Association between age group and seroma formation was not statistically significant. The Chi square value is 5.66 and the P-value is 0.129.

Table 1

S.No.	Age Group (Yrs.)	Seroma Formation		Total (%)	Chi-square
		Yes (%)	No (%)		
1	31-40	0	5 (5.38)	5 (5)	X ² =5.66
2	41-50	2 (28.57)	24 (25.81)	26 (26)	
3	51-60	2 (28.57)	38 (40.86)	40 (40)	
4	61-70	2 (28.57)	25 (26.88)	27 (27)	P=0.129
5	71-80	1 (14.29)	1 (1.07)	2 (2)	
	Total	7 (100)	93 (100)	100 (100)	

Body Mass index distribution of Study population

In the present study 52% of the patients were falling within the normal BMI category (18.5- 24.9), 41% patients were falling in to overweight category of BMI 25-29.9. only 7% patients were falling in to the obesity category of BMI 30-34.9.

Table 2

S.no	BMI (kg/m ²)	Number	Percentage
1	<18.5	0	0
2	18.5-24.9	52	52
3	25-34.9	41	41
4	30-34.5	7	7
	Total	100	100

Association between BMI and Seroma formation among the study Population

In the present study, seroma formation was more in the obese women 57.14% and 42.86% in overweight women. Association between BMI and seroma formation was statistically significant. Chi square value was 11.92 and p value was 0.0055.

Table 3

S.No.	BMI (Kg/M2)	Seroma formation		Total (%)	Chi-square
		Yes (%)	No (%)		
1	<18.5		0	0	P=0.0055
2	18.5-24.9	0	52 (55.91))	52 (52)	
3	25-29.9	3 (42.86)	38 (40.86)	41 (41)	
4	30-34.9	4 (57.14)	3 (3.23)	7 (7)	
5	Total	7 (100)	93 (100)	100 (100)	

Distribution of Study population based on Frequency of Days Drain kept in situ

In the present study 100% post-operative women were had the Drain kept in situ for up to 4days, 97% women were had the drain in place for 5 days and only 70% women were had the drain in place for 7 days.

Table 4

S.NO	Drain kept in situ (days)	Number	Percentage
1	1	100	100
2	2	100	100
3	3	100	100
4	4	100	100
5	5	97	97
6	6	81	81
7	7	70	70

Association between level of axillary nodes clearance and Seroma formation among the study Population

Table 5

S.No.	Level of axillary nodes clearance	Seroma Formation		Total (%)	Fisher's Exact Test
		Yes (%)	No (%)		
1	2	7 (100)	84 (90.32))	91 (91)	F=1
2	3	0	9 (9.68)	9 (9)	P=1
3	Total	7 (100)	93 (100)	100 (100)	

In the current study, women undergone axillary lymph node clearance up to level to 2 had developed the seroma formation. Who under gone axillary lymph node clearance up to level 3 were not developed any seroma formation. The association between level of 42.86% 57.14% Seroma formation Right Left Axillary lymph node clearance and seroma formation was not proven statistically significant. The Fisher's Exact Test value was one

Volume of Drain during the post-operative period among the study population

In the current study, mean volume of the drain constant reducing from day one to day seven. The drain mean volume of day 1 and day were 128.07 ± 14.32 and 92.21 ± 12.69 respectively.

Table 6

S.No.	Post-Operative Day	Drain in Situ	Volume of Drain in ml (Mean &SD)
1	1	100	128.07 ± 14.32
2	2	100	116.99 ± 13.45
3	3	100	108.89 ± 13.61
4	4	100	99.32 ± 13.41
5	5	97	92.21 ± 12.69
6	6	81	87.87 ± 9.35
7	7	70	83.27 ± 7.89

DISCUSSION

Breast cancer is the most common cancer in woman and surgical management remains the main line of management. The most common types of breast surgeries are MRM & BCS. Seroma is the commonest sequel following breast cancer surgery.

After mastectomy “seroma” formation which is collection of serous fluid occurs beneath the skin flaps in potential space^[10]. The accumulation of seroma causes elevation of flaps from chest wall & axilla, it hampers the adhesion to tissue bed. Seroma may resolve in few weeks but fluid accumulation causes the skin to stretch & sag, it causes discomfort to the patient & prolongation of the length of hospital stay. It can thus lead to complications such as wound hematoma, wound infection, necrosis of flaps, wound break down, prolonged hospitalization, delayed recovery, psychological distress and delay in starting chemotherapy.^[11]

Thus, although a number of factors have been correlated with seroma formation, strong data on factors associated with seroma formation are still rare. Various studies have shown that suturing of skin flaps is a successful means of reducing seroma formation^[12]. The success of external compression dressings has not yet been validated adequately through randomized studies.

Early drain removal has also been shown not to significantly affect seroma formation while reducing duration of drainage and other postoperative morbidity^[13]. Complications due to these methods are not much different from the standard drain method and are not frequent or serious.

A large operative field, division of lymphatic channels, the loose axillary skin hollow that follows surgical resection and the highly mobile, dependent nature of the area” are the reasons for formation of seroma.^[14]

Our study included 100 randomly selected patients with the diagnosis of breast carcinoma undergoing Modified radical mastectomy (MRM). Follow up was done to look for the day wise drain collection and effect of various factors like age, BMI, early drain removal, level of lymph node dissection on seroma formation^[15]. Certain other studies shown the similar results regarding seroma formation.

The placement in the gravitational gradient vector provides greater performance compared to the placement of two to three separate channels that oppose it^[16]. Therefore, the pectoro-axillary drainage system is the finest placement of all other vectors, even compared to the multiple drain placement. Meanwhile, the preference of using conventional or vacuum drainage channels does not affect significantly towards the drainage placement.

LIMITATIONS

- Sample size is limited.
- It is a single centre study.
- Level 3 axillary clearance done in only few patients.
- Male breast cancers not included in the study.

CONCLUSION

1. The factors influencing seroma formation following modified radical mastectomy for carcinoma breast are as follows;
 - a. Area of the raw surface created on the anterior chest wall, axilla and lateral chest wall and inner surface of the resulting flaps – larger the surface area, higher the seroma rate.

b. Volume of the breast and axillary fatty-lymphatic tissue – greater the volume, higher the seroma rate.

2. Both the factors act synergistically.

3. A higher drain output on post-operative day 3 is likely to predict the increased possibility of seroma formation.

Factors like age of the patient, BMI, neo-adjuvant chemotherapy, number of lymph nodes removed and the drain removal day have no bearing on seroma rate.

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