

## Original Research Article

# A study on role of continuous suction drain tube in post-mastectomy seroma collection in carcinoma breast

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## ABSTRACT

**Background:** The essential parts of surgical management are breast conservation surgery and modified radical mastectomy of Auchincloss. Seroma is the most common complication following surgery of the breast. By creating negative pressure and obliterating dead space. The continuous suction drain tube procedure has been suggested as one potential technique to reduce the incidence of seroma in breast surgery by creating negative pressure. The aim was to study the effect of continuous suction drain tube in reducing seroma and to compare with standard closed suction drain.

**Methods:** Totally 50 female were observed in the study. Patients undergoing modified radical mastectomy for breast carcinoma were included in this study. During the closure, the wound was closed with a closed-suction drain. Suction drain end was connected to a suction pump which was available in the wards.

**Results:** The age of patients with a peak incidence in the 4<sup>th</sup> decade of life ranging from 35 years to 80 years. The quantity of seroma in the postoperative period was measured on 3<sup>rd</sup> day, 7<sup>th</sup> day, 10<sup>th</sup> day, 12<sup>th</sup> day and 15<sup>th</sup> day. There was a significant difference in the seroma quantity postoperatively, thus permitting an earlier removal of drain tube in the study group.

**Conclusions:** The role of continuous suction drain tube in modified radical mastectomy has reduced the formation of seroma significantly has led to the early removal of drains, institution of 1<sup>st</sup> cycle of chemotherapy before discharging the patient and thus reducing the hospital stay. It has also led to low incidence of flap necrosis postoperatively.

**Keywords:** Carcinoma breast, Chemotherapy, Continuous suction drainage, Radical mastectomy

## INTRODUCTION

According to the reports obtained, female breast carcinoma was considered to be a first tumor from the times of Egyptian civilization. Hippocrates, father of modern medicine considered surgery as the only option to treat this condition.<sup>1</sup> During celsus period a prototype for a radical mastectomy was made. Metastatic nature of the disease was recognized by Le Dran who suggested the removal of primary and axillary groups in continuity. For the past 80 years, surgery was the main modality of treatment. A detailed description of radical mastectomy was made by Halstead of Baltimore in 1894. Various

improvisations have been made in the field of medicine due to recent advances.<sup>2</sup> The essential part of surgical management is breast conservation surgery and modified radical mastectomy of Auchincloss. Seroma is the most common complication following surgery of the breast. By creating negative pressure and obliterating dead space will encourage adhesions of the flaps to the underlying muscles.<sup>3</sup> The continuous suction drain tube procedure has been suggested as one potential technique to reduce the incidence of seroma in breast surgery by creating negative pressure. Humans and most primates have only one pair of the gland, one gland on each side develops in pectoral area, but the number of glands differs widely among different

mammalian species. Polymastia (supernumerary breasts), polythelia (nipples) may develop in approximately 1% of the females.<sup>4</sup> The development of the sesupernumerary structures occurs along milk line. During postnatal life, extensive growth and development of mammary glands are seen in females, whereas in males normally minimal development of the glands seen.<sup>5</sup> The growth of mammary gland in females is mainly regulated by hormones (estrogens) and is also related to age. Around 20 years of age, the breasts are very well developed and at around 40 years of age atrophy begins premenopausal. Striking changes noted in the volume and the functional activity of the breast tissue at the time of pregnancy and lactation.<sup>6</sup> Due to variations in ovarian hormone levels, menstrual cycles also show structural changes. Hormonal changes and mammary gland involuntary changes occur during menopause. The gland diminishes its structural volume, contour and form and is replaced by fat and connective tissue.<sup>7</sup>

## METHODS

This was a prospective study of about 30 patients with Breast Carcinoma to the out patient department of the Government Stanley Medical College and Hospital from January 2016 to September 2016.

### Inclusion criteria

Patients undergoing modified radical mastectomy for carcinoma breast.

### Exclusion criteria

- Patients undergoing breast conservation surgery
- Breast reconstruction
- Previously operated patients

In the department treatment, patients undergoing modified radical mastectomy for breast carcinoma were included in this study. During the closure, the wound was closed with a closed-suction drain. Suction drain end was connected to a suction pump which was available in the wards. The amount of seroma collected in a vacuum was calculated in a standard measuring jar every day. A suction drain was disconnected from the pump for every three hours with a one-hour interval. The volume of seroma was compared to those patients undergoing closed suction drain. When the total daily amount was less than 30ml, drains were removed. For each patient, total days with drain, postoperative drainage volume, and day of drain removal were recorded.

## RESULTS

This study was conducted in the department of general surgery, Government Stanley Medical College and Hospital, Chennai, India for a period of nine months. After obtaining an informed consent from patients and who fulfilled the inclusion criteria, were included in this study.

Total number of patients enrolled in this study- 30. Total number of patients underwent continuous suction drain- 15. The quantity of seroma in the postoperative period was measured on 3<sup>rd</sup> day, 7<sup>th</sup> day, 10<sup>th</sup> day, 12<sup>th</sup> day and 15<sup>th</sup> day and tabulated.

**Table 1: Age-wise distribution of patients.**

Age group (years)	No. of patients	Percentage
31-40	2	6.6%
41-50	15	50%
51-60	7	23.3%
61-70	5	16.6%

The age of patients with peak incidence in the 4<sup>th</sup> decade of life ranging from 35 years to 80 years.

**Table 2: Stage wise distribution.**

Stage	Number of patients	Percentage
IA	1	3.3%
IIA	9	30%
IIB	9	30%
IIIA	8	26.6%
IIIB	3	10%

Between the two groups, there was a significant difference in the seroma quantity postoperatively, thus permitting an earlier removal of drain tube in the study group.

**Table 3: Average quantity of seroma.**

Day	Study group	Control group
POD 3	75ml	100ml
POD 7	30ml	55ml
POD 10	<5ml	25ml
POD 12	Nil	10ml
POD 15	Nil	Nil

There was a significant reduction of seroma in study group compared to control group.

**Table 4: Average days of suction drain tube removal.**

Study group	Control group
7-9 days	12 days

## DISCUSSION

Enbloc resection of lymphatics and fatty tissues are done during surgical ablation of the breast. Accumulation of blood and lymph transudation are expected. The pathophysiology of seroma formation is not fully understood. Sagging of skin and hence delay in adjuvant therapy initiation occurs if excessive accumulation occurs. Future trials involving identification of predictive variables are important to assess individual risk of seroma formation which helps in reducing the incidence of

seroma.<sup>8</sup> Seroma occurs in most patients after surgery, but all patients are not clinically symptomatic. Its incidence ranges between 2.5% to 51%. Flap necrosis, sepsis, prolonged recovery period is some of the morbidity caused by seroma formation. Most frequent complication of the surgery is seroma formation beneath the skin flaps or in the axilla. Seroma formation occurs in about 30% of the cases.<sup>9</sup> Wound infections in the majority are secondary to skin flap necrosis but are infrequent after mastectomy. Its management includes the culture of the wound, debridement and appropriate antibiotics. Hemorrhage in the postoperative period is very rare, which is managed in the operating room by early exploration and re-establishment of drainage. The incidence of lymphedema is around 10% after a modified radical mastectomy. Lymphedema incidence increases in case of extended axillary node dissection, obesity, the presence of pathologic lymphnodes and adjuvant radiation therapy. The extent of lymphedema can be reduced by using intermittent compression devices and compressive sleeves.<sup>10</sup> Ambrose who used drains to keep war wounds draining. Johann Schultetus who first recommended to use wick into a draining tube to increase its efficacy. Lorenz Heister who used Penrose drain. Raffl described the practical method of ensuring adequate drainage of seroma and adherence of skin flaps to chest wall following radical mastectomy.<sup>11</sup> Following surgical procedures, pressure dressings always become saturated with serum, causing maceration of the skin, foul odor. skin flap tacking is time-consuming, causes pain and focal necrosis. Frequent dressings increase the risk of infection. These are eliminated by use of continuous suction negative pressure.<sup>12</sup> Divino and Gustave noted drains prevents seroma after axillary dissection. It was hypothesized that daily aspiration of seromas would keep wound cavity dry and allow wound flaps to adhere to chest wall preventing fluid accumulation resulting in more rapid resolution.<sup>13</sup> The advantages of drainages are reduced use of dressings; reduced incidence of tissue breakdown and infection and patient comforts is improved postoperatively. Studies were also done to analyze the usefulness in tacking subcutaneous tissues to secure the flaps. Use of tissue glue to close dead space remains controversial.<sup>14</sup> But following thermal trauma in electrocautery dissection, an increase in seroma incidence is noted by Maddox MA, et al According to the study made by Maddox MA et al factors like age, initial 72 hours wound drainage and patient's weight are considered to be significant.<sup>15</sup> Drainage of significantly more fluid has an association with seroma formation. Generally seroma formation starts on the 7<sup>th</sup> day, attains peak on the 8<sup>th</sup> day and slows down to a 16<sup>th</sup> postoperative day.<sup>16</sup> Also according to his study, age is considered to be an important factor as the frequency of occurrence increases with age. According to the study by Halsted WS et al with 116 patients, drains did not prevent the formation of aseroma, instead, they caused longer postoperative stay.<sup>17</sup> According to Nadkarni MS et al, prospective randomized study on 160 patients with breast cancer showed 90% incidence of seroma in those who underwent surgery.<sup>18</sup> Incidence changes to 82.2% if scissors are used

for dissection and ligatures to achieve hemostasis. Also, suction drain or corrugated drain doesn't have any influence on seroma formation. Seroma formation was considered as a necessary evil and not influenced by any of the above factors was the statement with his retrospective study of 359 patients.<sup>19</sup> Retrospective studies concluded that sentinel lymphnode biopsy shows a reduction in seroma formation. This conclusion is made from one meta-analysis, 7 prospective studies, 51 randomised control trials, 7 retrospective studies.<sup>20</sup>

## CONCLUSION

A total number of patients involved in the study period- 30 patients. Total number of patients on continuous suction drain tube- 15 patients. A total number of patients on standard wound closure and closed suction drain tube- 15 patients. The seroma quantity was almost less than half of the control group in the study group on the corresponding days. However, further studies are needed to know whether co-morbid illness like diabetes, hypertension and institution of neo-adjuvant chemotherapy has any confounding effect on the formation of seroma.

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