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STUDY ON POST MASTECTOMY SEROMA FORMATION IN CARCINOMA BREAST

General Surgery

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ABSTRACT

Background: Breast cancer is one of the most common cancer throughout the world & a leading cause of cancer related female mortality within the 2nd-6th decade of life. Mastectomy is the mainstay option for most cases of carcinoma breast till date. Post mastectomy seroma formation remains not only a common complication but also a agonising event for both the patient and operating surgeon.

Materials & Methods: A prospective study was carried out on 50 female patients who presented to the surgical OPD of IMS & SUM Hospital between July 2015 to July 2017. After obtaining an exhaustive history a thorough clinical examination done, followed by required investigations and posted for surgery. All post-operative findings were recorded under specific parameters.

Results & Conclusions: Seroma remains the most common post-op complication following mastectomy for carcinoma breast. Use of electro cautery is significantly associated with causation of seroma, hence against injudicious use of cautery during breast surgeries. Persistent drain output beyond a week should alert the possibility of seroma formation. Treatment of seroma should initially be limited to observation if seroma is small, followed by repeated aspiration if collection is significant, however if recurrence occurs even after 4 aspirations re-insertion of drain should be planned.

KEYWORDS

Breast cancer, seroma, mastectomy

Introduction:

Breast cancer is one of the most site specific cancers in women & a leading cause of cancer related female mortality between 20-60yrs age. The incidence of breast cancer is increasing primarily in women >55 years. For the years 2015, there will be an estimated 1.55 lac new cases of breast cancer and about 76000 women in India are expected to die of the disease.

As with every surgery, breast surgeries too come with their share of complications like axillary vessel injury, shoulder dysfunction, pain, numbness, infections, flap necrosis, seroma formation, lymphedema, scapular winging, etc[1].

Ever since the very first mastectomies performed by Halsted in 1882, surgeons have faced several complications of which seroma formation is one of the most common[2]. Seroma formation usually resolves within a few weeks. Many breast surgeons view this as an unavoidable nuisance than as a serious complication. However excessive seroma accumulation causes the skin to stretch and sag or give away, resulting in patient discomfort & prolonged hospital stay[3].

Seroma is also thought to be caused by the fact that mastectomy leaves a lot of empty space under the skin, where the original tumor laden breast used to be. The walls around this void are raw & oozy, causing the serous ooze to gather up as seroma.

Commonly followed treatment for a small localized seroma is simple observation as many of them spontaneously resolve. Repeated aspiration with a wide gauge needle and syringe followed by pressure bandage (keeping in view the area of its formation) is reserved for large symptomatic seromas causing discomfort[4].Delayed shoulder physiotherapy hinders drainage[5], hence should be promoted.

Attempts at prevention of seroma formation commonly include closed vaccum suction drain application, closing of dead space[5] as much possible & as per recent research steroid injection in post-op period may help in reducing its incidence.

Aims and Objectives:

a) To study the pattern of various early complications(within 6 months) after MRM in our study population
b) To evaluate influence of clinical, pathological & technical parameters in relation to various complications with special reference to seroma formation
c) To evaluate the effectiveness of various modalities in treatment of seroma formation

Materials and Methods:

A prospective observational study was carried out on 50 female patients who presented to the surgical OPD of IMS & SUM Hospital between July 2015 to July 2017.

Inclusion criteria: Female patients of any age undergoing MRM for carcinoma breast at our hospital, irrespective of their chemotherapy & radiotherapy status who were willing to attend follow up for 6 months post surgery.

Exclusion criteria: Patients who were unwilling for follow up and patients with post-surgical complications operated outside our facility.

Detailed history was taken from subjects, followed by thorough clinical examination on admission. Necessary investigations were done to diagnose carcinoma of breast. Proper informed consent was taken from patient and relatives for surgery and participation in study. Observation of intra-operative techniques during mastectomy were done. Daily observation of patients during hospital stay to notice any complications until her discharge. Observation of treatment of seroma formation was also done.

Besides General physical examination, clinical examination of breast focussed on size of lump, involvement of skin or chest wall & lymph node status (considered positive only after pathological confirmation). Fasting blood glucose levels & postprandial blood glucose levels among routine investigations. FNAC, mammogram, USG of breast, axilla and abdomen were also undertaken.

Intra-operative techniques observed include pre-op antibiotic status, type of surgery, usage of scalpel or electro-cautery to raise skin flaps, skin flap thickness, types of sutures & drains used and use of compression bandage.

Pathological consideration include type of malignancy, grade of tumor, lymph node status & tumor size.

Observations during hospital stay encompass condition of skin flap, margin necrosis (along suture line), flap necrosis (along entire flap), hematoma (verified by aspiration), cellulitis with or without abscess, pain/ numbness of axilla, impaired shoulder mobility, seroma formation and time of drain removal.

Observations of treatment of seroma formation include repeated aspiration with or without compressive bandage, re-insertion of drain.

Results and Analysis:

a) Incidence of various early complications after mastectomy (Table 1)

Seroma	20%
Impaired shoulder mobility	16%
Pain/ numbness in axilla/ upperarm	10%
Phantom breast syndrome	10%
Cellulitis (with or without abscess)	4%
Marginal necrosis of flap	2%
Scapular winging	0%
Hematoma	0%

b) Relationship of age and seroma formation (Table 2)

Age in years	Seroma present	seroma absent	Total
>45	8	30	38
<45	2	10	12
Total	10	40	50

c) Relationship of Obesity, Hypertension & Diabetes Mellitus with seroma formation (Table 3,4,5)

	Seroma present	seroma absent	Total
Obese (BMI>30kg/m2)	3	9	12
Non-obese	7	31	38
Total	10	40	50

	Seroma present	seroma absent	Total
Hypertensive patients	2	9	11
Normotensive patients	6	27	33
Total	10	40	50

	Seroma present	seroma absent	Total
Diabetic patients	0	4	4
Non-diabetic patients	10	36	46
Total	10	40	50

d) Relationship of neoadjuvant chemotherapy & with seroma formation (Table 6)

	Seroma present	seroma absent	Total
Pts receiving NACT	1	7	8
Pts not receiving NACT	9	33	42
Total	10	40	50

e) Relationship of tumor type and seroma formation (Table 7)

	Seroma present	seroma absent	Total
Infiltrating ductal carcinoma	10	39	49
Infiltrating lobular carcinoma	0	1	1
Total	10	40	50

f) Relationship of tumor size and seroma formation (Table 8)

Tumor stage	Seroma present	seroma absent	Total
T1	0	1	1
T2	7	20	27
T3	3	10	13
T4	0	9	9

g) Relationship of lymph node status and seroma formation (Table 9)

	Seroma present	seroma absent	Total
Lymph node involved	7	31	38
Lymph node not involved	3	9	12
Total	10	40	50

h) Relationship of type of surgery and seroma formation (Table 10)

	Seroma present	seroma absent	Total
Modified radical mastectomy (MRM)	7	31	38
Simple mastectomy	3	9	12
Total	10	40	50

i) Relationship of using scalpel vs electro-cautery and seroma formation (Table 11)

	Seroma present	seroma absent	Total
Electro-cautery	9	20	29
Scalpel	1	20	21
Total	10	40	50

j) Relationship of time of drain removal and seroma formation (Table 12)

Drain removal day (post-op)	Seroma present	seroma absent	Total
Day 3	0	0	0
Day 4	0	7	7
Day 5	1	23	24
Day 6	5	9	14
>= Day 7	4	1	5

Discussion :

Discussion of various early complications following mastectomy in our study(Table 1):

Seroma formation beneath the skin flaps comprise one of the most frequent complications encountered post mastectomy reportedly occurring in as many as 30% cases [4]. In our study too seroma is the commonest complication to occur in around 20% cases. Seroma formation is an agony for surgeons and definite morbidity for the patients. It defers initiation of adjuvant therapy and may lead to poor long term cosmetic outcome after radiotherapy. Following seroma formation impaired shoulder mobility(16%), pain/ numbness along ipsilateral arm(10%) and phantom breast syndrome were next frequent complications. Wound infection occur infrequently after mastectomy and majority are result of skin flap necrosis[4], in our study too only a single patient, who was diabetic developed wound infection that was managed conservatively.

Discussion of association of seroma formation with various clinical, pathological and technical parameters:

1) **AGE** : Chow Louis, LooWings [5], found in their study that mastectomy in patients above 45 years had significant association with seroma formation. But in our study there was no statistical significance for association between age >45 years and seroma formation as p= 0.7405, as per Chi square test. **(Table 2)**
2) **COMORBID CONDITIONS**:

A) **Obesity**: Kumar S et al [6], found in their study that there is significant association between obesity and seroma formation after mastectomy. But in our study as per **table 3**, according to Chi square test p value of association between obesity and seroma formation is p=0.9340, hence statistically insignificant. This finding in our study matches with the one done by Burak WE et al [7], which finds inconclusive association between obesity and seroma formation.

B) **Hypertension**: Akinci M et al [8] found positive association between hypertension and seroma formation after mastectomy. But in our study we couldn't find a significant association between hypertension and seroma as evident from **table 4**, p value is not <0.05, hence statistically insignificant.

C) **Diabetes mellitus**: Say CC et al [9] in their study could not find a significant association between diabetes mellitus and seroma, our finding about this association is similar to their study.**(Table 5)**

3) **Neo-adjuvant Chemotherapy**: Earnest A. et al [10] found in their study that there is not an association between NACT and post-op seroma formation. Our study also suggest no significant association between post op seroma formation and NACT, as is evident from **table 6**, pvalue= 0.9231, which is statistically insignificant.
4) **Type of tumor**: Chilson TR et al [11] found that there is no significant association between histological type of tumor and seroma formation after surgery. In our study, out of 50 patients only 1 patient had infiltrating lobular carcinoma and rest all had infiltrating ductal carcinoma, and all patients who develop seroma (10 patients) belonged to latter variety. Though according to **table 7**, there is no significant association between any type of tumor and seroma, in our study p value=0.4448, still larger sample size is necessary for this study.
5) **Size of tumor**: Lumanchi F et al [12] in their study found no significant association between tumor size and seroma formation. Our study has also been consistent with this finding as seen in

table 8, p value=0.8201, hence statistically insignificant.

6) **Lymph node status**: Somers RG et al [13], Browse DJ et al [14] and Kumar S et al [6] found no significant association between lymph node status and seroma formation. Our study also confirms this finding as evident from **table 9**, p value=0.9340(statistically insignificant).
7) **Type of surgery**: K Porter et al [15]found no significant association between type of surgery adopted and seroma formation. Our findings are also similar as evident in **table 10**, p value=0.556i.e. statistically insignificant.
8) **Use of scalpel or electro-cautery**: K Porter et al [15] conclusively showed in their study that the use of electro-cautery is associated with more seroma formation. Our findings also matches this, as evident from **table 11**. According to Chi square test p value for association between use of electro cautery to raise skin flap during mastectomy and seroma formation is 0.00531, which is statistically significant. Use of coagulation mode electro-cautery causes temporary sealing of miniature lymphatic channels which open up later on , as well as extensive fat necrosis due to dissipation of heat and current to neighbouring tissues. However scalpel dissection, though causes less incidence of seroma formation, makes the operative field more oozy, blood loss is more, above that except for expert scalpel dissection may have variable flap thickness.
9) **Time of drain removal**: Chow Louis et al [5]found that drainage for more than 8 days is significantly associated with seroma formation. Our study goes parallel to this finding above but differs slightly, as seen in **table 12**, pvalue= 0.0001 which is statistically significant. Delayed drain removal during post-op period is associated with more incidence of seroma formation

Discussion on treatment of seroma

In our study out of 50 patients, 10 developed seroma. Persistent seroma may be treated with repeated aspiration or reinsertion of a drain [16]. In our study we tried repeated aspiration maximum upto 4 times, strictly under aseptic precautions. It was sufficient for 8out of 10 patients. But for the remaining 2 patients we had to insert drains, since seroma persisted even after 4 aspirations.

Because of small number of sample size we could not compare which modality of treatment for seroma formation was advantageous over the other, but patients who had drains re-inserted didnot develop any recurrence allowing it drain entirely.

Summary and Conclusion

A) Seroma remains the most common post-op complication following mastectomy for carcinoma breast. However its exact etiology remains obscure even today.
B) Use of electro cautery is significantly associated with causation of seroma. Hence there should not be injudicious use of cautery during breast surgeries.
C) Persistent drain output for more than 7 days should alert the possibility of seroma formation
D) Our study found no association between seroma formation and parameters viz, age, presence of hypertension, diabetes mellitus, obesity, tumor size, tumor type, lymphnode involvement, type of surgery adopted, etc.
E) Treatment of seroma should initially be limited to observation if seroma is small, followed by repeated aspiration if collection is significant, however if recurrence occurs even after 4 aspirations re-insertion of drain should be planned.

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