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COMPARISON BETWEEN SINGLE DRAIN VERSUS TWO DRAINS IN THE PREVENTION OF POST-MASTECTOMY SEROMA

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Abstract

Breast cancer is managed with many surgical options. Modified radical mastectomy with axillary dissection is the commonest procedure done nowadays. It is not free from complications, where seroma one of these. A comparative study was conducted to evaluate the effectiveness of single delayed removed drain versus two drains early removed for the prevention of seroma formation.

One hundred and fifty patients were treated by modified radical mastectomy with axillary dissection for breast cancer between January 2010 and September 2016 in Al-Fayhaa General Hospital. Patients were divided into two groups, fifty patients were managed with single drain left for nine to ten days and the other one hundred patients had two drains removed after five days for prevention of seroma formation under mastectomy flaps.

The highest age group affected by breast cancer was the 36-45 years and the lowest one was the 25-35 years. The incidence of seroma was 12% for the first group and 30% for the second one. The wound infection slightly more in the first group (14%) when compared with the other group (12%).

In conclusion, the use of single drain for slightly longer time is better than two drains removed early in the prevention of seroma formation.

Introduction

Breast cancer is the most common malignancy among women in most developed and developing regions of the world with nearly a million new cases each year[1,2]. Breast cancer remained the second leading cause of cancer death among women worldwide over the past three decades[3,4]. In the United States, the breast cancer was estimated at 1 in 13 in 1970, it was 1 in 11 in 1980 and the frequency was 1 in 8 in 1996[5]. Many surgical options for treatment of breast cancer are done such as modified radical mastectomy (MRM) and breast conserving surgery[6]. The most common early complications following modified radical mastectomy are seroma formation and wound infection[7]. Seroma is a collection of serous fluid in the dead space of post-mastectomy skin flaps and axilla following MRM[8,9]. Incidence of seroma formation after breast surgery varies between 2.5% and 51%[10-12]. Seroma accumulation elevate the flaps from the chest wall and axilla and hampering their adherence to the tissue bed leading to significance morbidity such as delayed wound healing, wound dehiscence, wound infection and delayed initiation of adjuvant therapy. The pathogenesis of seroma has not been fully understood. Seroma is formed by acute inflammatory exudate in response to surgical trauma and acute phase of wound healing[13,14]. Although seroma formation is the most frequent postoperative complication after breast cancer surgery but now increasingly being considered side effect

of surgery rather than a complication[15]. A variety of techniques have been employed to decrease incidence of seroma. These share the common aim of obliterating the dead space and include quilting, skin flap suturing, fibrin sealants, external compression, shoulder immobilization and prolonged suction drainage[16,17]. The aim of this study is to evaluate the effect of use of single drain for longer time in comparison with the use of two drains with relatively shorter time to prevent seroma formation.

Patients and methods

A prospective comparative clinical study was carried out at Al-Fayhaa General Hospital / Department of Surgery in Basrah, between January 2010 and September 2016. The patients included in this study are those who were diagnosed with infiltrative ductal carcinoma by excisional biopsy or two times FNA. Modified radical mastectomy was done for stage IB, II and III. The patients were divided in to two groups, the first group (50 patients) managed with single drain place under the skin flaps passing to the axilla, and the second group (100 patients), with two drains, one in the axilla and the other under the skin flaps for prevention of seroma formation postoperatively. The drain of the first group was removed between 9 - 11 days even when the drainage is less than 30 ml, while drains of the second group were removed usually after 5 days when it becomes less than 30 ml/day. After discharging in the second or third postoperative day, the patients are followed postoperatively for two months in the outpatient department, and the seroma diagnosed clinically when the patient present with axillary and/or skin flaps fluctuating swelling, or with aid of ultrasonography (fluid collection in the axilla and/or under the flaps). Ethical approval was granted by ethical approval board of the institution. Data were analyzed using SPSS 18.0 software.

Result

A total number of one hundred and fifty patients who were managed in Al Fayhaa General Hospital during the period from January 2010 to September 2016 were included in this study, excluding those patients who were lost from follow up. The age distribution for the studied patients with breast cancer is summarized in Table (I), were the lowest age for breast cancer was seen in the less than 25 years patients.

The patients postoperative complications regarding seroma and wound infection were analyzed, Table (II) shows the incidence of seroma in both groups, in the first group six patients out of fifty patients were develop seroma and thirty patients out of hundred were develop seroma in the second group, with the incidence of 12% and 30% respectively.

The incidence of wound infection in the two groups is shown in the Table (III), in which seven patients develop wound infection in the first group (14%) and twelve patients (12%) in the second group.

Table I: Age distribution of the patients

Age (years)	No.	%
25-35	10	6.7
36-45	64	42.7
46-55	38	25.3
56-65	27	18
Above 65	11	7.3

Table II: Incidence of seroma in the two groups

Seroma	Group (1) 50 patients	Group (2) 100 patients	P-value
Number of affected patients	6	30	Z= 2.43
Percentage	12	30	P< 0.05

Table III: Incidence of wound infection in the two groups

Wound infection	Group (1) 50 patients	Group (2) 100 patients	P-value
Number of affected patients	7	12	Z= 0.34
Percentage	14	12	P> 0.05

Discussion

Surgical options for the management of breast cancer are many. Modified radical mastectomy with axillary clearance is the most common procedure used nowadays[18]. Axillary dissection remains an integral part of the conservative and radical breast cancer surgery for prognostic and curative purposes[19].

The incidence of seroma formation following modified radical mastectomy about 50%[20], and was 15.8% in other study by Gonzalez EA et al[21].

The rich lymphatic drainage of the breast establishes the tendency for seroma formation within any closed space that result from breast surgery. The net fibrinolytic activity and low fibrinogen levels within lymphatic fluid collection account for seroma formation[13,22].

The closed space of axillary wound and under the mastectomy skin flaps will harbor the seroma[9,23].

The skin flaps will heal and adhere to the chest wall after one to three weeks, as evidenced by diminished drain output[9].

So trying to leave the drain for more than one week, allowing the process of adhesion to be start between the flaps and the chest wall.

There are several factors implicated in seroma formation like number of positive nodes, extent of lymph node dissection, intraoperative lymphatic channel ligation, postoperative radiation, postoperative arm activity, preoperative chemotherapy and use of electrocautery and vascular disruption[24–30].

Petrek et al, in a prospective randomized trial showed that the most significant factor that causing the seroma were the number and extent of axillary lymph node involvement[31]. Minimization of the electrocautery has consistently been shown to reduce seroma formation when compared with sharp scalpel dissection, although this approach may increase overall operating time[32]. Neither laser scalpel technique nor a bipolar vessel sealing system has been found beneficial in terms of postoperative seroma[33].

Theories of etiology are important in determining the most likely surgical technique for prevention of postoperative seroma formation. Various techniques have been studied in an attempt to minimize post-mastectomy drainage volumes and the incidence of seroma[34].

The most frequently employed technique for prevention of seroma formation is closed suction drainage. Most surgeons are used closed suction drainage for those patients underwent mastectomy and axillary clearance and avoid drains for patients with breast conserving surgery and sentinel node biopsy[35].

The use of drain after breast cancer surgery was mostly investigated for their controversial effect in reducing or

preventing seroma. Suction drainage was introduced in 1974 by Murphy which applying negative pressure and obliterate the dead space after breast surgery and axillary dissection[36].

Studies examining avoidance of drainage for mastectomy and axillary clearance have suggest that while it is possible to avoid placement of drains at the time of surgery, such a policy will be associated with increased number and volume of seroma aspiration. A systemic review of published trails concluded that drains are necessary in this situation[35].

The influence of negative pressure are preventing seroma formation, skin flap opposition to the chest wall, facilitate wound healing and reducing the incidence of wound infection, wound dehiscence or flap necrosis[37,38].

Most surgeons tend to remove the drain when the drainage volume was less than 20-50 ml and the patients discharged early with drain in situ[37].

In this study comparing two groups of patients, in the first group we used single drain for 9 -11 days and in the second group two drains which were removed early after five days. The incidence of seroma in the first group was 12%, and 30% in the second group with P value less than 0.05 (significant finding).

Gupta et al. in a prospective randomized study grouped patients in to 5 days and 8 days drainage after MRM and founded that removal of drain on the fifth postoperative day was safe but associated with an increase in incidence of seroma[37].

A meta-analysis involving more than 500 patients examined six randomized controlled trails comparing volume-controlled drainage with either none or short term drainage following axillary dissection for breast cancer surgery. Those patients randomized to volume-controlled drainage (drain remove only when less than 30-50 ml/24hr) were significantly less likely to develop clinically relevant seroma compared with patients without drains or short term removal. However, the former group stayed in hospital for slightly longer periods[39].

However, seroma formation was not influenced by the intensity of negative suction pressure, by the number of the drains or the choice of closed suction drainage or pressure drainage[40].

Drains can be uncomfortable and are associated with an increased risk of infection[41].

In this study there is slight increase in the incidence of wound infection when using one drains (14%) when compare with the other group (12%) with P value of more than 0.05 (non-significant).

Talbot et al. research show that, there is no difference in the rate of wound infection among the studied three groups after long term follow up, when (group 1) have prolonged closed suction drainage, while(group 2) have two-days short term drainage, and the last (group 3) no drainage[42].

Conclusion

The use of single drain for slightly longer time better than the use of two drains removed early for the prevention of seroma formation after modified radical mastectomy.

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