SURGICAL COMPLICATIONS FOLLOWING RADICAL MASTECTOMY

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SUMMARY

Three hundred and six patients with a minimum of five year follow up, who had undergone radical mastectomy, were reviewed retrospectively regarding early and late surgical complications. Without any drainage, in only 5% of the patients seromas developed and aspirations were required for over two weeks. Seroma formation was not associated with the stage of the tumor. Necrosis of the lateral flap was seen most commonly (13.4%) followed by the necrosis of the graft (12.1%) and the medial flap (2.6%). While 28.2% had arm edema, in only 2% the edema was severe. The incidence of arm edema was not associated with the stage of the tumor, number of aspirations required or radiotherapy. Lateral flap necrosis increased the incidence of arm edema. Restriction of arm movements were noted in 44% but in only 8.1% this restriction was over 20%. Restriction of arm movements were associated with lateral flap necrosis and arm edema. No "wing scapula" deformity was noted. Meticulous surgical technique, early arm movements, and radiotherapy in fractionated doses decrease the morbidity rate after radical mastectomy.

Key Words : Radical mastectomy, complications

INTRODUCTION

As the Halstedian concept changed, the surgeon's role in the treatment of breast carcinoma has also changed. Minor operations rather than radical mastectomy are performed nowadays.

There is also no general agreement on the extent of axillary dissection to be performed for accurate staging of breast carcinoma. But many authors believe that, a complete level I,II,III dissection achieves the best staging. With a complete dissection radiotherapy to the axilla can be withheld, thus avoiding complications related to radiotherapy. The complications regarding radical mastectomy are those related to mastectomy and axillary dissection. Some authors prefer axillary sampling to a complete axillary dissection for a lesser morbidity rate.

Radical mastectomy has been shown to be superior to other techniques for axillary clearance (1). In this paper, a retrospective analysis of the complications following radical mastectomy has been made in the personal series of the senior author (HAG). Special attention is given to late complications and arm edema in particular.

PATIENTS AND METHODS

Three hundred and six patients, with a minimum of five year follow up, who were operated between 1959 - 1985 are the subject of the study. All of the patients were preoperatively staged according to the Colombia clinical staging criteria and Halsted radical mastectomy was performed to Stage A and B patients with the technique modified by Haagensen (2). The long thoracic nerve was preserved and other nerves in the area including the thoracodorsal nerve were routinely cut. The defect was closed with a split thickness skin graft obtained from the ipsilateral thigh and no drains were used. The operative wound was dressed and a compressive bandage was applied for three days after which the dressing was changed daily without any compression. Any collection under the flaps or the graft was aspirated with an 18 gauge needle on a daily basis and the number of aspirations were recorded.

Necrosis and/or infection of the graft, donor area, lateral and medial flaps were recorded together with the duration of hospital stay.

Arm and shoulder movements were begun as active physiotherapy as soon as the need for aspirations ended. The degree of the abduction and extension movements of the arm was checked in each office visit and compared with the contralateral side. The degree of the arm function was determined and perfect arm function (180° abduction and 180° extension) was defined as 100%.

To determine the extent of arm edema, the circumference of the arms were recorded 15 cm above the olecranon and the difference recorded. According to the difference between the circumferences, arm edema was defined as mild (< 3 cm), moderate (3-5 cm) and severe (> 6 cm).

Three hundred and six patients had a median of 130 months follow up (range being 61-366 months). The degree of arm edema and arm movements on the last control were considered.

Patients having less than four metastatic lymph nodes in the axilla did not receive any adjuvant therapy. Those patients having four or more metastatic lymph nodes received chemotherapy and radiotherapy to the chest wall and axilla. Radiotherapy was given at a dose of 5000 cGy with fractionated doses over five weeks.

RESULTS

Out of 306 patients, one patient died intraoperatively and the remaining 305 female patients had a median age of 45 years. The median hospital stay for these patients was 14 days with a range of 3-52 days. 184 of these patients were stage A and 121 were stage B patients.

Aspiration:
After 3 days of compressive bandage 146 patients required no aspirations at all. In 159 patients the median number of aspirations required was 5 with a range of 1-30 aspirations. While 25 patients required only one aspiration, in only 15 patients (5%) aspiration number was greater than 14 (2 weeks).

Of 184 stage A patients 93 (50.5%) required at least one aspiration. At least one aspiration was required in 66 of 121 stage B patients (54.5%). 47 patients had greater than 3 metastatic lymph nodes in the axilla and a median of 5 aspirations were required in 29 of them (61.7%). Aspirations were required in 48.8% of patients having tumors in the right breast as compared to 54.7% in those having tumors in the left.

Necrosis: (Flap-graft-donor area)
Thirty-seven patients (12.1%) had partial or complete necrosis of the graft. In 17 patients infection of the graft was noticed and in 8 of these necrosis was also present. Infection of the donor site was seen in 20 patients and in 3 of these full thickness skin loss required grafting.

Medial flap necrosis was seen in 8 patients (2.6%) while lateral flap necrosis was more common being seen in 41 patients (13.4%), 6 patients had both medial and lateral flap necrosis.

In 41 patients with lateral flap necrosis aspirations were required in 19 (46.3%) and in 22 of 41 no aspirations were required at all.

Arm Edema:
Eighty - six patients (28.2%) revealed arm edema. In 47 the edema was mild (15.4%), in 33 moderate (10.8%), and in 6 severe (2.0%).

Forty-seven patients having more than 3 metastatic lymph nodes in the axilla, received radiotherapy, 15 patients revealed arm edema (31.9%) 7 of them having moderate or severe edema.

One hundred and twenty-one patients were stage B patients having at least one metastatic lymph node in the axilla and in 37 of these, arm edema was detected (30.6%). 13 of these had moderate or severe arm edema.

Ipsilateral arm edema was present in 27.7% of left sided and 28.8% right sided mastectomies. Out of 159 patients in whom aspirations were required arm edema was present in 47 patients (29.6%),11 of whom had moderate or severe arm edema.

Arm edema was seen in 39 of 146 patients in whom no aspirations were required (26.7%). Of 41 patients with necrosis of the lateral flap 20 had arm edema (50%) and in 13 the arm edema was either moderate or severe.

Arm movements:
One hundred and thirty-four patients (44%) had restriction of arm movements in their last follow up. In 25 (8.1%) the restriction was greater than 20% and in 29 (8.8%) between 10-20%.

Of the 25 with more than 20% restriction 8 had received postoperative adjuvant radiotherapy to the chest wall and axilla and 5 of these also had arm edema. And seven of the 25 with more than 20% restriction had associated lateral flap necrosis in the early postoperative period. Ten of these 25 had required more than three aspirations after surgery.

No "wing scapula" defect due to the trauma of the long thoracic nerve was encountered.

Major complications of radical mastectomy are shown in Table I.

DISCUSSION

The complications of radical mastectomy are those related to mastectomy and axillary dissection. Although radical mastectomy for carcinoma of the breast is rarely performed nowadays, a complete level I,II,III dissection of the axilla is the preferred surgical procedure for accurate staging and local control of the disease (3,4).

Buyart and Baun have demonstrated increased incidence of seroma formation in node positive patients due to increased lymphatic and serous discharge in these patients (5). The high rate of lymphatic blockage due to tumor cells has been held

responsible for this high rate.

The number of aspirations required did not depend on the clinical stage in this retrospective review. In these patients all blood vessels and lymphatics were ligated and no electrocautery were used. Also the apex was carefully ligated to prevent lymphatic backflow. With these precautions, 47.8% of the patients required no aspirations at all and in the remaining 159 patients median aspiration number was 5 without any drainage. In stage A and B patients, lymphatic blockage due to tumor cells is quite unlikely and the median number of aspirations was the same in two groups. There was a slight increase in the rate of seroma formation as the number of metastatic lymph nodes increased.

Aitken has stressed the importance of meticulous dissection and technique in preventing the postoperative seroma formation after radical mastectomy (6). We also believe in the importance of the technique of dissection in preventing postoperative seromas.

Flap necrosis did not have any impact on the number of aspirations required.Seroma formation, like other postoperative complications, also was not associated with the right or left location of the tumor.

The rate of necrosis of the graft, medial flap and lateral flap was 12.1%, 2.6% and 13.4% respectively. The high rate of necrosis of the larger lateral flap is to be expected because the thin flaps, which are dissected at a plane superficial to the superficial fascia, are more prone to vascular insufficiency.

Previously we had reported higher rate of local recurrence in the medial flap (7). This may be due to early dissection of the lateral flap diverting the lymphatic and venous flow towards the medial flap. The better blood supply of the medial flap may also be responsible for the increase in the rate of local recurrence on this site.

28.2% of patients undergoing radical mastectomy had arm edema on the ipsilateral side. The arm edema was severe in only 2%. Interestingly, arm edema was seen in 31.9 % of patients having more than 3 metastatic lymph nodes in the axilla all of whom received postoperative radiotherapy. This incidence is similar to those not receiving radiotherapy. The incidence of severe arm edema was also not increased. Several studies have demonstrated increased incidence of arm edema after radiotherapy (4,8,9).

Radiotherapy, to our patients, were given to the chest wall and axilla in divided doses over five weeks. This schema must have prevented the arm edema formation as reported in other studies (10).

The incidence of arm edema, as expected, was not different on the right or the left side. There was no correlation between the number of aspirations and the incidence of arm edema.

The incidence of arm edema was significantly higher in patients having lateral flap necrosis. 50% of these patients had arm edema and 65% of these were either moderate or severe. The associated infection and fibrosis seen in the later course of healing must be responsible for this high rate of arm edema.

Most of the patients had restrictions in the early

Table I : Complications of radical mastectomy.

		No of patients
Seroma		
No aspiration required	Stage A	91
	Stage B	55
	Total	146
At least one aspiration required (range 1-30)	Stage A	93
	Stage B	66
	Total	159
Necrosis		
Graft		37
Medial flap		8
Lateral flap		41
	Total	86
Arm edema		
Mild		47
Moderate		33
Severe		6
	Total	86
Arm movements		
Restriction of arm movements		
< 10%		80
10-20%		29
> 20%		25
	Total	134

postoperative period but early arm exercises made arm movement restrictions unlikely. Only 8% of the patients had more than 20% restriction of their arm. Arm edema and lateral flap necrosis were associated with this restriction in most of these patients. Early arm movements, as reported before, did not seem to increase the rate of seroma formation (11).

Due to the meticulous dissection of the long thoracic nerve, no wing scapula deformities, seen after injury of this nerve, were encountered.

Complete axillary clearance, which is best performed technically in radical mastectomy, was found to have a low morbidity rate. Severe arm edema was limited to 2% of the patients. The incidence of arm edema did not increase with radiotherapy when radiotherapy was given in divided doses. Early active arm exercises reduced the restriction of arm movement. The stage of the tumor was found not to be associated with the morbidity rate. As with other surgical procedures, the morbidity rate of axillary dissection and mastectomy decreases with meticulous surgical technique and radical mastectomy can be carried out with a low morbidity rate.

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