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Vertical Mastectomy with Lateral Wound Closure: Description of an Original Technique

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Abstract

Total mastectomy is the most common breast surgery performed for breast cancer in developing countries. In most of these mastectomies, the Stewart's or the Orr incisions are utilized, however the resulting scars from these traditional incisions are conspicuously centred across the anterior chest and the resulting scar may not be aesthetically satisfying. Our vertical mastectomy technique with lateral wound closure, utilizes anterior-medial and posterior-lateral skin flaps which are sutured in the anterior axillary line, extending transversely into the inframammary fold. This provides an elegant closure with no visible scar lines in the centre of the ipsilateral chest. The technique can be utilized for non-T4 tumors in all quadrants of the breast and for unifocal T4-tumors involving the outer quadrants, once it is possible to sufficiently laterally displace the nipple-areolar complex. Here we describe the first utilizing this technique for a patient with metastatic breast cancer with an uncontrolled primary.

Introduction

Breast Cancer in most common cause of cancer related morbidity and mortality in Jamaican women and often presents as locally advanced disease [1-3]. As such, total mastectomies are the most common breast surgeries performed as breast conservation would generally be contraindicated in the presence of locally advanced disease [4,5]. The Stewart's or Orr incisions are the most frequently used techniques in performing mastectomies for these patients. The Stewart's incision is performed by creating superior and inferior flaps which result in a horizontal wound closure across the patient's chest. This technique was described over 100 years ago for the performance of radical mastectomies, and it has remained relatively unchanged since [6]. The Orr incision is used for tumors in the upper outer or lower inner quadrant of the breast and results in a more oblique surgical scar when compared to the classical Stewart's incision closure, but it is not aesthetically discreet either [7]. With these incision techniques, patient satisfaction rates after total mastectomies are variable, especially in patients with elevated BMI or undergoing unilateral mastectomies without breast reconstruction [8,9]. The presence of 'dog ears', skin redundancies and conspicuous scars are common patient complaints which may result in social or sexual withdrawal, and low overall confidence [10].

The vertical mastectomy with lateral closure that we have described creates anterior-medial and posterior-lateral flaps rather than the traditional superior and inferior flaps. It is an option for patients with locally advanced breast cancers of the outer quadrants, but it is also well indicated for tumours in all quadrants where the skin is not involved by the cancer and there is sufficient lateral displacement of the breast. With this incision, mastectomies for relatively large upper outer quadrant tumours are easy to perform and the scar is well hidden laterally in the anterior axillary line which allows the patient a great degree of social flexibility. Lateral tri-coning ('dog ears') are also readily avoided.

Case Presentation

A 58-year-old post-menopausal female presented with an ulcerated a right breast mass for which she had neglected seeking medical attention for the more than 12 months but decided to present due to increased wound bleeding at dressing changes. She had a negative family history for breast cancer and denied ever having formal breast cancer screening. A 10 x 7 cm ulcerating right breast mass was confirmed on clinical examination and there was partial fixation of this mass to the lateral chest wall (Figure 1A) with enlarged mobile level I axillary lymph nodes. Her left breast and axilla were clinically unremarkable except for grade IIA ptosis. Subsequent core needle biopsy confirmed invasive mammary carcinoma of the right breast of no special type with Scarff-Bloom-Richardson grade 3 and triple negative subtype on immunohistochemistry, with Ki-67 at 65%. There was evidence of pulmonary metastases on CT scan, and she was sequenced with systemic chemotherapy with a view to improve the possibility of complete resection of her uncontrolled primary site cancer. After the completion of systemic chemotherapy there was an approximately 40-50% reduction in the size of the primary breast tumor, with decreased fixation to the underlying muscle. We performed a vertical mastectomy with lateral wound closure approximately 4 weeks after the completion of chemotherapy. Except for the ulceration of the overlying skin by the cancer, all other surgical margins were negative at final histology.

Figure 1A: Pre-operative photo of patient with T4 right breast cancer located in the upper outer quadrant.

Figure 1B: CT scan showing ulcerating upper outer quadrant right breast cancer with pectoralis major muscle infiltration from the patient shown in Figure 1A.

Figures 1 C and 1 D: Oblique and lateral chest wall views of lateral wound closure of vertical mastectomy technique on the fifth post-operative day (Patient #1).

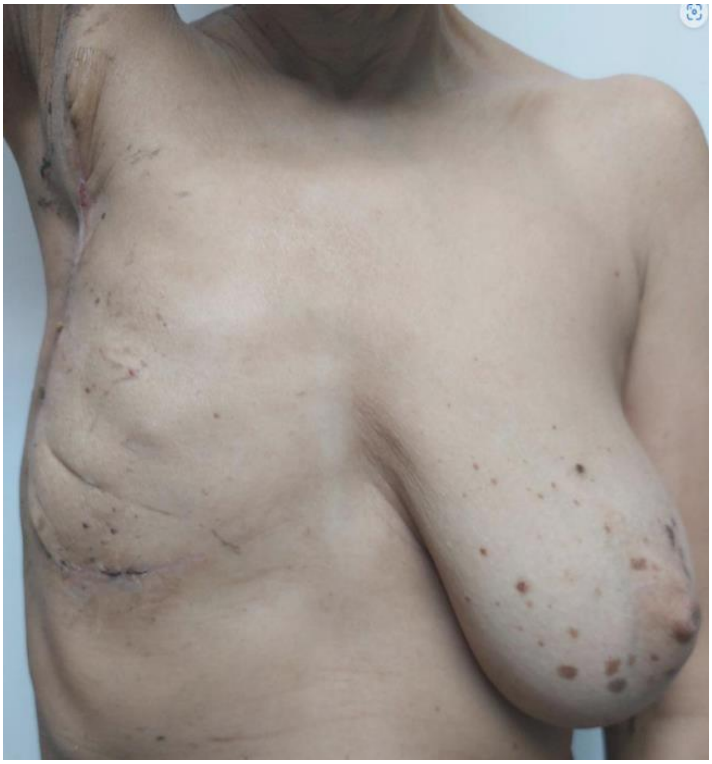

Figure 1 E: Anterior view of chest wall 8 weeks post-operation with lateral closure of incisions.

Technique

The patient is positioned supine towards the edge of the operating table on the side of the primary surgeon with the ipsilateral arm abducted to just below 90 degrees, on a padded arm board. The surgeon and the first assistant are ideally positioned on the ipsilateral side with the assistant cephalic to the abducted arm and the primary surgeon caudad. The patient is marked, identifying the midline, the lateral sternal border, sternal notch, clavicle, latissimus dorsi muscle fold, the inframammary crease, and the anterior axillary line. The medial limb of the skin incision starts in the anterior axillary line without crossing into the axilla. The incision is extended inferiorly, curving medial to the nipple-areolar complex (NAC). Once inferior to the NAC, the incision takes a brief lateral curve before turning medially and horizontally at the inframammary crease, ending in the mid-clavicular line. The anterior-medial flap is raised by dissecting in the anterior lamellar fascial plane of the breast extending to the lateral border of the sternum medially, to the clavicle superiorly and the infra-mammary crease inferiorly. The breast tissue can then be dissected off the fascia of the pectoralis major muscle at this point, dissecting from medial to lateral, which gives excellent exposure of the lateral chest wall and the thoracodorsal bundle on the latissimus dorsi muscle. An axillary lymph node dissection or sentinel lymph node excision biopsy can be seamlessly performed at this point. The lateral skin incision starts at the same point as the medial incision, forming an apex in the anterior axillary line, just below the axilla. The lateral incision continues inferiorly, curving lateral to the nipple-areolar complex, before turning horizontally at the inframammary crease below the level of the previous incision. The lateral incision ends where it meets the medial incision, forming the second apex at the mid-clavicular line. The lateral Incision is used to raise a posterior-lateral flap in the anterior lamellar plane, extending to the lattisimus dorsi muscle posteriorly. The breast is removed en bloc and the wound is closed in layers with the final wound closure lying in the anterior axillary line and the inframammary crease.

Indications

The Vertical mastectomy with lateral wound closure technique affords the surgeon with much flexibility if there is enough lateral breast deviation (the medial border of the areolar can be brought ideally to within 1-2 cm of the ipsilateral anterior axillary line).

1. Upper outer quadrant tumours (with or without skin involvement)
2. Lower outer quadrant tumours (with or without skin involvement)
3. Upper inner quadrant tumours without skin involvement
4. Lower inner quadrant tumours without skin involvement
5. Central tumours (with or without skin involvement)

Discussion

Breast cancer remains the most common cancer occurring in Jamaican women and accounts for 24% of cancer related mortalities [1]. The case fatality rates of breast cancer in our women are several times higher than in North American or Western European countries, which is due in part to the adverse cancer biology and the late stage of presentation of breast cancer in our women [2,11,12]. Nearly 40% of Jamaican women have locally advanced (stage III) breast cancer at the time of presentation and even with the indication for neoadjuvant systemic therapy, total mastectomy with axillary lymph node dissection is ultimately the surgery of choice for many patients with locally advanced breast cancer [2,13]. Unfortunately, the morbidity associated with these surgeries remain high [14].

The near vertical incisions used in our lateral closure mastectomy technique, allow the creation of anterior-medial and posterior-lateral flaps rather than the traditional superior and inferior flaps created with the Stewart's incision. The vertical incisions result in more discreet scar placements which allow the patients more flexibility in their choice of daily attire, as the final wound closure is in the anterior axillary line and inframammary crease, not centred across the anterior chest. It also avoids the creation of 'dog ears' which are cosmetically unpleasant and are a common source of patient distress after the standard Stewart or Orr mastectomy techniques [10,15]. The Stewart and the Orr techniques were originally described for the performance of radical mastectomies, and the resulting morbidities were accepted for good oncological clearance of breast cancer during a time where less importance was given to the aesthetics of the resulting scar.

While many techniques have been described for performing nipple and skin sparing mastectomies, there have been few original descriptions of alternate techniques to perform total mastectomies since the original publications of the Stewart or the Orr incisions [6,7,16,17]. The classic Stewart's incision facilitates the raising of superior and inferior flaps and a horizontal wound closure, while the Orr incision results in a diagonal wound closure with both techniques having incisions which often ends up crossing into the medial portion of the hemi-chest wall (breast cleavage area).

A lateral incision technique was described by Clough et al, which focussed on the elimination of the lateral dog ears using the 'L' technique, where two oblique incisions are used creating a lateral skin flap which is advanced superior-medially after extensive excision of the lateral adipose tissue. Importantly, the incisions should not be more than 2-3 cm apart at the axillary end. The resulting scar from this technique is oblique rather than vertical [18]. Many other modification techniques of mastectomy incisions have been used to address complications such as 'dog ears' with varying success [10,19-21].

Conclusion

Our vertical mastectomy technique with lateral wound closure is effective in performing total mastectomies. It may be used to replace the Stewart's and the Orr incisions for non-T4 cancers in all quadrants of the breasts, once there is sufficient lateral NAC displacement, as well as for laterally located T4 cancers. The final position of the wound closure is aesthetically well placed, and it avoids the creation of medial or lateral dog ears.

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