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Case Report

The application of completion mastectomy and immediate reconstruction in a patient unable to undergo radiotherapy following breast conserving surgery: a case report

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ABSTRACT

Breast conserving surgery (BCS) with adjuvant radiotherapy (RT) confers an equivalent 20 year survival rate to mastectomy. Concerningly, 15% of BCS patients do not receive RT. Several barriers to completing RT have been described. However, non-compliance with post-BCS radiotherapy due to severe claustrophobia is not well documented in the literature. We report the case of a patient who declined radiotherapy following BCS due to severe claustrophobia. With advances in oncoplastic breast surgery, completion nipple-sparing mastectomy (NSM) may be an alternative to simple mastectomy in BCS patients unable to undergo RT. NSM is an oncoplastic procedure that involves attaining complete oncologic resection whilst sparing the nipple-areolar complex. Recent literature highlights that NSM has more favourable aesthetic outcomes and improves quality of life compared to simple mastectomy. This report further describes the novel use of NSM and reconstruction for the case patient and highlights its potential use in patients who are unable to undergo neoadjuvant RT.

Keywords: Breast conserving surgery, Adjuvant radiotherapy, Mastectomy

INTRODUCTION

It is widely accepted that overall survival and rates of local recurrence in breast cancer are equivocal for mastectomy and breast conserving surgery (BCS) with radiotherapy.[1] Several meta-analyses highlight the long-term survival benefits of adjuvant radiotherapy after BCT as it reduces the risk of local cancer recurrence by treating undetected microscopic tumour deposits.[2,3] However, studies estimate that 15-36% of patients do not receive radiotherapy post-BCS, despite it being the standard of care.[4,5] Appropriate selection of patients for BCS is essential and depends on a range of factors including estimated resection volume relative to breast size, location of the cancer and the patient's ability to undergo adjuvant radiotherapy. Whilst several studies have provided insight into the medical and psychosocial barriers leading to the underutilisation of radiotherapy; including co-existing health problems, previous radiotherapy and mobility or ambulatory issues, few have reported claustrophobia as a barrier.[3] This case report describes the unusual case of a patient unable to undergo radiotherapy due to claustrophobia.

Historically, a completion mastectomy after inadequate BCT and/or radiotherapy required a modified radical (simple) mastectomy which involves the removal of the breast tissue, overlying skin and nipple. The more recent introduction of NSM with reconstruction enables the preservation of most of the breast's skin envelope including the nipple and areola. Provided there are sufficient oncologic indications for NSM, this procedure has equal survival outcomes, improved aesthetic outcomes and greater patient satisfaction compared to simple mastectomy. However, given this is a relatively new

procedure, there are few cases in the literature of nipple sparing mastectomy following BCS. This case report highlights the opportunity for advances in the application of NSM in patients unable to undergo radiotherapy following BCT.

CASE REPORT

A 50-year-old female presented to the general surgeon with a self-detected left breast lump. Her only risk factor for breast cancer was a thirty-year smoking history, having quit smoking nine years prior. She had a body mass index of 33 and ECOG performance status of zero. Clinical examination revealed a solitary irregular 2 cm mass at the 9 o'clock position of the left breast with no evidence of skin/muscle involvement or axillary lymphadenopathy.

Investigations

Mammography identified a corresponding ill-defined mass. Ultrasound revealed an irregular hypoechoic lesion (20×22×25 mm) with a high suspicion of a cancer. The contralateral breast and bilateral axillae were normal. Core biopsy confirmed triple negative invasive ductal carcinoma (IDC) of no special type.

A left breast wide local excision (WLE) and sentinel lymph node biopsy were completed by the general surgeon prior to the author's involvement in this case. The WLE was documented as performed through a 5 cm radial incision placed directly at 9 o-clock position of the left breast (Figure 1). Final pathology confirmed a 28 mm triple negative grade 3 IDC with surrounding ductal carcinoma in situ (DCIS) with clear margins and no lymph node involvement (pT2; pN0 (stage IIA), AJCC 7th Ed 2010)).

Figure 1: Post wide local excision and sentinel lymph node biopsy (pre-mastectomy).

Findings and subsequent treatment

Adjuvant chemotherapy and radiotherapy were recommended by the multidisciplinary team. Prior to chemotherapy, a CT staging scan was unable to be performed due to her previously unreported severe claustrophobia. Whilst able to complete chemotherapy, the radiation bunker used to deliver external beam therapy elicited a severe claustrophobic response and the patient was unable to receive radiotherapy, despite formal psychological therapy.

Upon discussion with the MDT, the patient's care was transferred to an oncoplastic surgeon for ongoing management. A completion mastectomy was recommended for satisfactory oncological management due to failure to deliver RT. The patient's preference was for an immediate implant-based reconstruction. Patient, tumour and breast related factors were taken into consideration and reconstruction was deemed safe by the oncoplastic surgeon. The patient was counselled pre-operatively about the potential risk of nipple areolar complex necrosis given the previous WLE and compromise to the medial vascular pedicle supplying the nipple.

The completion NSM was performed through the existing WLE scar to avoid an additional scar on the breast. The intraoperative use of spy camera fluorescent angiography provided reassurance of adequate flap and NAC perfusion post mastectomy. A direct-to-implant extra-pectoral reconstruction followed using a silicone implant placed in a TiLoop bra pocket mesh. Adequate volume and position symmetry were achieved.

Outcome and follow up

Post-operatively the patient's progress was uneventful. At the time of writing this report, nine months following the procedure, the patient remains satisfied with both her oncological and breast aesthetic outcomes (Figure 2).

Figure 2: 8 months post-nipple sparing completion mastectomy and direct-to-implant reconstruction.

DISCUSSION

Nipple-sparing mastectomy post-BCS

With advances in breast surgery and reconstruction, there is growing emphasis upon the aesthetic outcomes and improved quality of life for patients after surgery. Recent evidence supports higher satisfaction and better cosmetic results from conservative mastectomy (both nipple-sparing and sacrificing) compared with simple mastectomy.[6] NSM is a technically complex procedure which requires complete oncologic resection, including the removal of nipple-areolar ducts, whilst sparing the

NAC.[7] It requires careful selection of patients, typically those with a tumour located at least 2cm from the nipple on imaging.[8] Early studies have reported comparable oncological outcomes between NSM and total mastectomy.[7] There are however concerns regarding nipple necrosis and loss of nipple viability with NSM - which is particularly prevalent if resection occurs near the NAC due to potential disruption of the blood supply.[9] Despite these concerns, this case study highlights that with careful patient selection, meticulous surgical technique augmented with intraoperative use of fluorescent angiography, NSM can be used for BCS patients requiring completion mastectomy without the need for additional incisions on the breast. A recent study also reports positive outcomes of this procedure.[10]

Selection of patients for BCS

It is widely accepted that overall survival and rates of local recurrence in breast cancer are equivocal for mastectomy and BCS with radiotherapy.[1] Appropriate selection of patients for BCS depends on a range of factors including estimated resection volume relative to breast size, location of the cancer and the patient's ability to undergo adjuvant radiotherapy. However, studies estimate that 15 to 36% of patients do not receive radiotherapy post-BCS, despite it being the standard of care.[4,5,11] A number of medical and psychosocial barriers have been associated with the underutilisation of radiotherapy which highlight the importance of careful patient selection for BCS.[4] In an attempt to predict a patient's likelihood of receiving radiotherapy, Guidolin et al proposed a nomogram which stratifies risk of a patient not completing radiotherapy.[12] To date however, no studies have validated its use in clinical practice.

Claustrophobia in clinical practice

Refusal of adjuvant RT post-BCS due to claustrophobia is poorly described in current literature. Only one previous report has identified claustrophobia as a barrier to radiotherapy treatment in breast cancer.[13] Claustrophobia has however, been heavily examined in the context of medical imaging. Reported rates of claustrophobia are up to 15% for magnetic resonance imaging (MRI) and 6.7% for CT scans precluding completion of these tests in at least 1% overall.[14-17] Claustrophobia clearly presents an uncommon but notable challenge to medical practice. The resulting negative repercussions on diagnosis and treatment are substantial, but its effect on breast cancer patients unable to undergo RT is scarcely reported.

CONCLUSION

Nipple sparing mastectomy should be considered in patients who are unable to undergo radiotherapy following breast conserving therapy due to its better aesthetic outcomes and improved quality of life for patients compared with simple mastectomy. Despite it being the standard of care, a high proportion of patients do not undergo radiotherapy following breast conserving therapy and when selecting patients for breast conserving therapy, it is important to determine if there are any barriers to post-operative radiotherapy, such as severe claustrophobia.

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