

## Combined Partial Breast Reconstruction: An Extreme Oncoplastic Procedure for the Lateral Breast

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### Abstract

The Wise pattern therapeutic mammoplasty has facilitated breast conserving surgery in the face of large breast cancers. With extended and secondary pedicles, big cancers can be removed from the upper pole of large and ptotic breasts in inner, central or outer quadrants. However, mastectomy has traditionally been required when resection volumes exceed the capacity of this procedure. By utilising the addition of a lateral intercostal artery perforator (LICAP) flap to an extended pedicle therapeutic mammoplasty, we describe two cases in which breast conservation was achieved in this circumstance.

### Keywords

Breast conserving surgery; Radiotherapy; Therapeutic mammoplasty; Oncoplastic surgery.

## Introduction

Breast conserving surgery with adjuvant radiotherapy has seen great improvements in surgical outcomes for breast cancer sufferers in recent decades [1,2]. The benefits are manifold and vital to a woman's sense of self, her psychosocial health and her sexual health [3,4].

However, the deformity incurred by poorly planned or executed local excision and subsequent radiotherapy can have the opposite effect on a woman's wellbeing [5-7]. In decades past, excision of greater than 20% of the breast volume would invariably lead to debilitating deformity.

With the recent emergence of oncoplastic surgery - the use of plastic surgery techniques to reconstruct the breast following tumour excision - resection of much larger breast volumes has become feasible [8].

Not only are such resections possible, but by correcting ptosis and reducing excess volume, they often lead to a more aesthetically pleasing and functional breast, which can also tolerate adjuvant radiotherapy with fewer sequelae [9-11].

The Wise pattern therapeutic mammoplasty with or without extended or secondary pedicles, has made resection of very large tumours possible and safe. Even so, resection of large tumours in the outer quadrants may exceed the capacity of an isolated therapeutic mammoplasty to reconstruct [12,13].

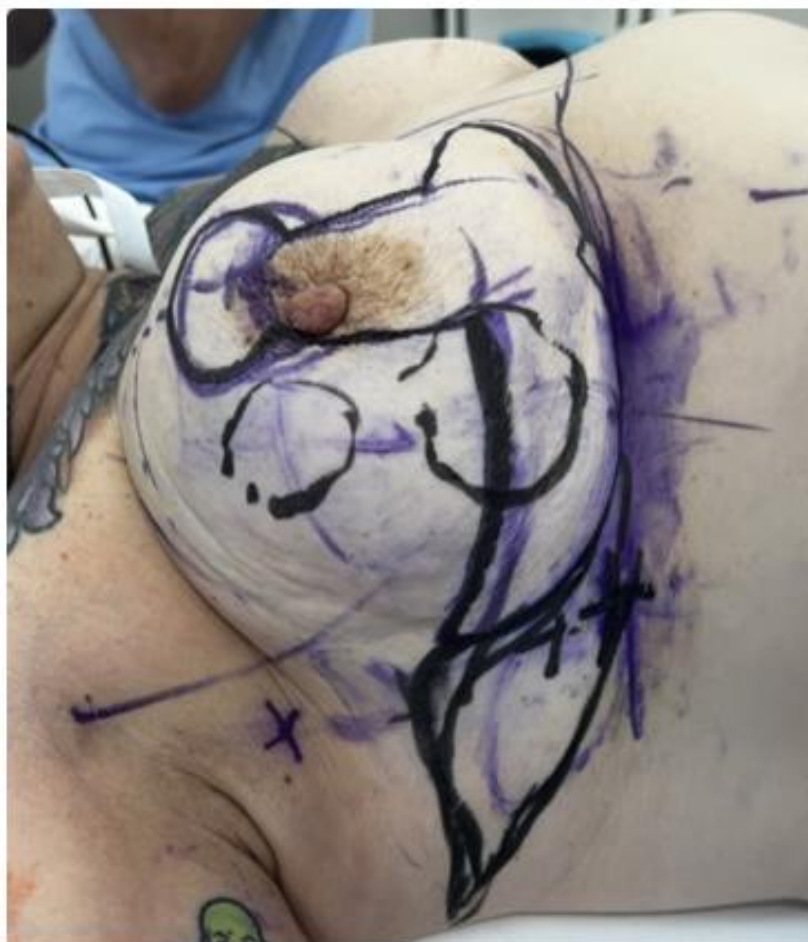
The LICAP flap has proven a versatile means of replacing lost volume in the outer quadrants of small breasts [14-16]. Supplied by perforators from the intercostal vessels, axillary subcutaneous tissue is mobilised and used to fill defects in the lateral breast. In our paper, we describe a case report of two patients with large lateral tumours who avoided mastectomy by the integration of Wise pattern therapeutic mammoplasty and LICAP volume replacement.

## Case 1

MB, a 49-year-old woman, presented with a self-detected right breast mass. She had no history of breast disease and her family history was significant only for a great grandmother who suffered from breast cancer in her 70s.

MB wore a DD bra and the lesion manifested as a thickening of the lateral breast. The lesion was causing dimpling and tethering of the overlying skin. There were no abnormal axillary lymph nodes to palpation.

Mammogram, ultrasound and MRI were performed and showed multifocal disease of the right breast. Biopsies confirmed multifocal invasive ductal carcinoma spanning much of the lateral breast (Figure 1).



**Figure 1:** Preoperative photograph highlighting lateral extent of multifocal disease and preoperative markup.

MB underwent a wide local excision of the disease via a Wise pattern incision with an extended superomedial pedicle. The reconstruction was completed with the addition of a LICAP flap to provide further lateral bulk. The specimen weighed 295g.

Histopathology confirmed the presence of two invasive ductal carcinomas of 35mm and 37mm, respectively. The lateral and superficial margins were close and the deep margin was involved by a satellite lesion. One of two sentinel nodes was involved by a 3.5mm deposit with extranodal extension and lymphovascular invasion.

MB returned to theatre for a re-excision of margins (6g total) and a completion axillary dissection. MB recovered well and underwent adjuvant chemotherapy and radiotherapy (Figure 2).



**Figure 2:** Postoperative photograph after radiotherapy.

## Case 2

CR, a 63-year-old woman presented with left nipple discharge. Subsequent mammogram found an 11cm area of calcifications in the lateral breast extending to the nipple. MRI was concordant with this and stereotactic core biopsy diagnosed it as low to intermediate grade DCIS. CR's family history comprised of only a great grandmother who developed breast cancer in her nineties.

CR wore a DD-cup bra and had grade 2 ptosis. The extent of the disease meant that resection of the entire lateral breast and nipple was necessary. A left-sided combined nipple-sacrificing Wise pattern therapeutic mammoplasty with LICAP flap reconstruction was performed. A total of 217g was resected, containing 100mm of low and intermediate grade DCIS with negative margins (Figure 3).

CR underwent adjuvant radiotherapy. She will undergo a right symmetrisation procedure in the near future.



**Figure 3:** Post-treatment photograph following combined LICAP and extended pedicle Wise pattern therapeutic mammoplasty and radiotherapy.

## Discussion

Breast preservation is extremely valuable to breast cancer patients and oncoplastic surgery has seen significant improvements in the availability and quality of breast conserving surgery [8, 17, 18]. The integration of therapeutic mammoplasty with LICAP partial breast reconstruction is logical and effective. When resection volumes exceed the capacity of each individual procedure's ability to reconstruct the lateral breast, breast conservation is now possible where previously mastectomy was necessary.

Schwartz first described this technique in 2018 [13]. In a series of 25 consecutive patients with a mean disease diameter of 6.5cm, they had no episodes of nipple necrosis or LICAP flap necrosis. Six patients (24%) had asymptomatic fat necrosis related to the TM pedicle and each case was managed conservatively. All patients received adjuvant XRT at an average of 6.5 weeks postoperatively.

The combination of TM and LICAP is anatomically sound. Therapeutic mammoplasty is able to fill upper outer quadrant defects with secondary or extended pedicles or a combination of these. For example, a Wise pattern TM with superomedial pedicle relies on the medial intercostal and septal perforators to perfuse the bulk of the breast and nipple-areola complex. Lower outer quadrant tissue, which is excised in a standard TM, can be retained and sustained by these same vessels via the subdermal plexus or by a secondary pedicle(s) from the 5<sup>th</sup> anterior intercostal perforators [12, 19]. Connections between the parenchyma and the lateral thoracic and LICAP perforators are divided in this process. The LICAP flap

draws blood supply from the 5<sup>th</sup> LICAPs with or without perforators from the lateral thoracic and 4<sup>th</sup> LICAPs [15, 20, 21]. The axillary tissue that is mobilised during LICAP reconstruction is extramammary and consequently unaffected by the glandular rearrangement of a TM. As such, significant lateral volume can be created by combining these procedures and we have found it often surplus to needs.

Axillary surgery is easily achieved with the combined partial breast reconstruction. The axilla is accessed for sentinel node biopsy by opening the back wall of the tumour bed via the TM incision or by separate axillary incision. TM and LICAP reconstruction have proven robust in the setting of axillary clearance in previous settings, as was found in Case 1 [14-16].

Radiotherapy is an important consideration following breast surgery. In isolation, therapeutic mammoplasty and LICAP reconstruction have each been proven to tolerate adjuvant radiotherapy well and with good cosmetic outcomes [22, 23]. Whilst rates of fat necrosis are higher following TM compared to standard wide excision, LICAP fat necrosis is comparable if not reduced [22-24]. In their cohort, Schwartz, 2018, had good results in 25 patients that received XRT following combined partial breast reconstruction [13].

The patients suitable for combined partial reconstruction typically have large primaries and would commonly require post mastectomy radiotherapy (PMRT) if undergoing mastectomy with or without immediate breast reconstruction (IBR) [25]. Furthermore, rates of PMRT are increasing generally with improved survival found in T1 or T2 primaries with N1 disease [26]. Breast reconstruction following mastectomy, be it implant or autologous tissue-based, does not tolerate radiotherapy well [27]. Firstly, complication rates following mastectomy with or without IBR are increased relative to TM and may delay adjuvant therapies [9]. Then when radiotherapy is applied, it leads to increased rates of contracture, fat necrosis and reconstruction failure with significant patient morbidity if this occurs [9,27].

The combined lateral breast reconstruction is limited by prolonged operating time and the need for contralateral symmetrisation to achieve a satisfactory cosmetic result [12]. Additionally, when boost radiotherapy is indicated, localisation of the tumour bed can be difficult due to significant parenchymal distortion [28-29]. The tumour bed distortion also has implications for margin re-excision, which should be performed by the initial surgeon and with caution to ensure accurate resection whilst preserving the blood supply to the flaps. It should also be noted that the posterolateral scar produced by harvesting a LICAP may also be unsightly or uncomfortable for patients. The effects of the scar may be mitigated in future by the use of a modified LICAP [15].

## Conclusion

The combined lateral breast reconstruction is a logical extension of the therapeutic mammoplasty. It offers the oncoplastic surgeon a means of preserving the breast following extensive resection of the lateral breast and the potential for significant patient benefits.

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