PC (Pedicle Conserving) Nipple Sparing Mastectomy for the Large Ptotic Breast: Overcoming the Challenging Breast for a Better Aesthetic Outcome

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Introduction

Nipple sparing mastectomy (NSM) with implant-based reconstruction (IBR) has become a standard of care in the treatment of breast cancer after being popularised in risk reduction surgery. It is an oncologically safe operation that offers superior aesthetics and greater patient satisfaction through the preservation of the nipple areolar complex (NAC).[1,2] Patients with large ptotic breasts have traditionally been precluded from having a NSM because of the ischaemic risks to the nipple posed by excessive skin envelopes and the size of prosthesis required. Furthermore, large implants are often not desired in this population of women. As the indications for NSM have expanded, different techniques have been described to mitigate the higher rate of NAC and skin necrosis with variable success.[3] This would typically include a reduction mammoplasty in either a staged or simultaneous operation with NSM and IBR. Whilst staged approaches have been associated with fewer ischaemic complications, they lead to delays in definitive oncological treatment. Low morbidity simultaneous mammoplasty with NSM and IBR is possible in patients with large ptotic breasts, but the ideal technique is yet to be determined. [3,4]

We propose a novel approach of performing simultaneous reduction mammoplasty and NSM with IBR via Wise pattern incision that preserves the maximum number of dermal pedicles, whilst using indocyanine green (ICG) perfusion imaging to assess the vascularity of the pedicles and the NAC.

Method

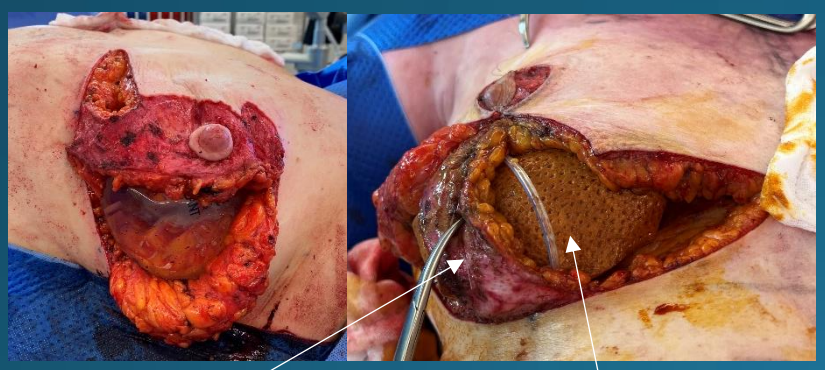
Pedicle Conserving Nipple Sparing Mastectomies (PC NSM) in 4 women with large, ptotic breasts was performed in a single surgeon series. Patient demographics, tumour size, pathology, margin status, adjuvant treatment received, quality of life, complications and independent assessment of aesthetic result were recorded. The technique involved NSM via a Wise pattern incision whilst preserving all dermal pedicles supplying the NAC, including the superior, supero-medial, lateral and inferior pedicles. Immediate implant based reconstruction was performed with a tissue expander and the vascularity of the dermal pedicles confirmed intraoperatively with utilisation of the SPY system and ICG. Second stage reconstruction involved exchanging tissue expanders to permanent implants +/- autologous fat transfer after completion of adjuvant cancer treatment.

Patient Demographics

Patient	1	2	3	4
Age	47	64	43	55
Reason for NSM	Risk reduction (ATM gene)	Breast cancer	Breast Cancer	Breast Cancer
Pre-Op Bra Size	E	C	DD	DD
Ptosis	Grade 3	Grade 2	Grade 2	Grade 2
Breast Volume at Resection	606gms, 515gms	342gms	530gms, 573gms	237gms (Prev Augmentation 275cc)
Neoadjuvant Chemotherapy	-	No	Yes	No
Breast Cancer Size	-	70mm	80mm	53mm
Breast Cancer Subtype	-	DCIS	Luminal B	Luminal B
Implant Size	375cc	320cc	545cc	445cc
Post-Op Bra Size	C	C	C/D	D

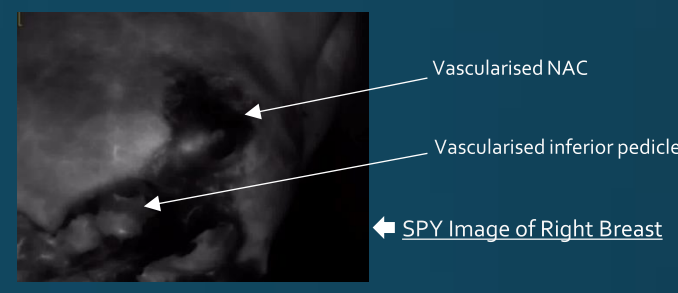
Procedure

Patients were counselled pre-operatively and potential risks and complications outlined along with clear instructions regarding postoperative care and management. Medical illustration photographs were obtained with patient consent. Pre-operative skin markings were undertaken prior to the procedure. Prophylactic intravenous antibiotic with 2g of cephazolin and venous thromboembolism prophylaxis with 40mg clexane was given on induction and continued for 24hrs post-operatively.



NSM and concurrent breast reduction using a wise-pattern incision were performed preserving superior, supero-medial, supero-lateral and inferior dermal pedicles to the nipple. The vertical limb of the Wise pattern incision further more allowed accurate mastectomy plane to be followed in the upper pole of the breasts. During the procedures, nipple viability was monitored regularly visually. Skin clips were applied temporarily with implant gel sizers for selection of suitable tissue expander. 2 stage IBR was performed in the pre-pectoral fashion using Flex HD® Acellular Hydrated Dermis (MENTOR®) wrapping of a partially pre-expanded CPX4 Tissue Expander.

SPY fluorescence imaging system with ICG was used to assess nipple vascularity and confirm blood flow through the dermal pedicles after appropriately sized expander was placed. A 10Fr Blake silicone drain was placed and PICO dressings were used.



IV cephazolin was continued for 24 hours postoperatively followed by oral cephalexin for the duration of the drains, which were removed once seroma output reduced to less than 30mL per day. The expanders were gradually filled in consulting rooms and were subsequently exchanged for permanent implants at an appropriate time after completion of adjuvant therapy.

Results

All of our patients recovered well post operatively and achieved an aesthetically pleasing result with correction of ptosis and immediate reconstruction with an expander. There were no ischemia or necrosis to the NAC in any of the patients. All patients reported that they were pleased with their results.

NSM with IBR is an oncologically safe procedure with known good aesthetic outcomes. Historically, women with large and ptotic breasts were excluded from this option due to high risk of failure from skin and especially nipple necrosis. A staged approach consisting of breast reduction followed by NSM have previously been described. However, this limits the suitable population to the prophylactic setting with increase cost of multiple surgeries. The PC NSM offers a novel approach with simultaneous breast reduction and NSM with preservation of maximal dermal pedicles to the NAC, thereby reducing risk of ischemia. We utilised SPY fluorescence perfusion imaging to confirm adequate vascular supply.

We described PC NSM in 4 women with large ptotic breasts. These patients all successfully underwent PC NSM through a Wise pattern reduction incision. Preservation of all dermal pedicles with NAC vascularity was confirmed with SPY fluorescence imaging with immediate IBR. Standard pre, post and intraoperative care was provided to all patients. Expanders were reviewed weekly in consulting rooms and eventually exchanged for an implant after completion of adjuvant therapy.

This novel technique has been successful due to coordinated teamwork in a multidisciplinary team. Careful patient selection, education via multiple consults and discussions, providing patients with multiple modes of information and close post operative care is vital.

Conclusion

PC NSM provides a superior option for both an oncologically safe excision of breast cancer as well as a reduction and lift of large ptotic breasts whilst preserving the NAC and thereby achieving an aesthetically pleasing outcome.

References

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