A SINGLE CENTRE EXPERIENCE OF LOCAL PERFORATOR FLAPS IN ONCOPLASTIC BREAST SURGERY; A CROSS-SECTIONAL STUDY

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ABBREVIATIONS

LPF: Local perforator flap

BCS: Breast conservation surgery

OPS: Oncoplastic surgery

ICAP: Intercostal artery perforator

LTAP: Lateral thoracic artery perforator

DICAP: Dorsal intercostal artery perforator

LICAP: Lateral intercostal artery perforator

AICAP: Anterior intercostal artery perforator

IMF: Infra-mammary fold

ERC: Ethical Review Committee

AKUH: Aga Khan University Hospital

UOQ: Upper outer quadrant

LOQ: Lower outer quadrant

LIQ: Lower inner quadrant

INTRODUCTION

With breast cancer now presenting in earlier stages and the validation of several landmark trials confirming similar outcomes in women undergoing mastectomy versus breast conservation along with breast irradiation, more and more women are now candidates for a conservative approach [1,2]. Various techniques have emerged over the years for preservation of breast cosmesis without compromising the principles of tumor excision. One of such newer techniques for breast volume replacement after oncological surgery is the use of chest wall fasciocutaneous pedicled perforator flaps, such as the intercostal artery perforator flap (ICAP) and the lateral thoracic artery perforator flap (LTAP) for immediate partial breast reconstruction amongst few [4].

The use of a skin-muscle flap along with its intercostal neurovascular pedicle was first described in 1931 and has been in use since then for coverage of various surface defects [3,4]. The same principle utilizing the intercostal neurovascular pedicle or one of its perforators supplying the flap is now used for partial breast reconstructions with large defects with the preservation of underlying muscle [4,5]. This reduces the morbidity associated with muscle dissection. Based on the nutrient artery and the anatomic location of perforators, the intercostal artery perforator flaps (ICAP) can be classified as Dorsal intercostal artery perforator flap (DICAP) when the perforators arise from the vertebral segment of the intercostal vessels, Lateral intercostal artery perforator flap (LICAP) when the flap is based on perforators originating from the costal segment and Anterior intercostal artery perforator flap (AICAP) when the flap is based on perforators of anterior intercostal artery through the rectus abdominis or the external oblique muscles [4]. Hamdi et al reported the first use of LICAP flap in partial breast reconstruction for defects located in the lateral quadrants of the breast [5]. Losken et al described the use of AICAP flaps to cover defects over the inferior or medial quadrants of the breast due to its short pedicle [4,6].

Another newer option of a pedicled perforator flap for partial breast reconstruction is that of a Lateral thoracic artery perforator flap (LTAP) described by McCulley et al. This flap is based on single or multiple perforators arising from the lateral thoracic vessels. LTAP flap for breast reconstruction has advantage over other forms of pedicled perforator flaps; it has a secure vascular supply, has a transversely oriented scar which easily hides in the bra line, greater flap mobility and reach can be achieved with a narrow pedicle with minimal donor site morbidity and can also include LICAP perforators for better flap perfusion [7]. The perforators are identified by a hand held doppler preoperatively [4,5]. Both ICAP and LTAP flaps are considered safe and reliable for immediate partial breast reconstructions with good cosmetic outcomes and minimal morbidities as compared to traditional myocutaneous flaps [4,7].

Patient selection with good surgical technique following appropriate oncological principles is vital for safety and good outcomes of these flaps. These techniques have recently been adopted in our institution; therefore, the aim of this study is to report our initial clinical experience with pedicled perforator flaps in partial breast reconstruction along with cosmetic outcomes and patient satisfaction.

OBJECTIVES

1. To evaluate the surgical techniques of pedicled local fasciocutaneous perforator flaps (LPF) in partial breast reconstruction in terms of flap anatomy, location of perforators, operative time and post-operative morbidities in a tertiary care hospital of Pakistan.
2. To assess cosmetic outcomes and patient satisfaction following local perforator flaps in oncoplastic breast conserving surgery using the validated BREAST-Q BCT domain version 2.0.

METHODOLOGY

Study Design:
This will be a cross-sectional study.

Study Site and Data Collection Period:

All female patients who underwent a LPF for immediate partial breast reconstruction in the Breast section of The Aga Khan University Hospital will be included. For cosmetic outcomes and patient satisfaction, a follow-up of at least 3 months after surgery will be mandatory before participation in the survey.

ELIGIBILITY CRITERIA

Inclusion Criteria:
All female patients who underwent a LPF for immediate partial breast reconstruction at the breast surgery section of The Aga Khan University Hospital, Karachi will be included in the study.

Exclusion Criteria:
For evaluation of surgical techniques, since this is a review of cases already operated, there is no exclusion criteria.
For cosmetic outcomes and patient satisfaction, patients who have lost to follow, expired or not giving consent to participate in the study will be excluded.

STUDY OUTCOMES

Surgical techniques of pedicled local fasciocutaneous perforator flaps in partial breast reconstruction in terms of flap anatomy, location of perforators, operative time and post-operative morbidities will be collected on a pre-designed form by the researcher (Annexure 1). Cosmetic outcomes and patient satisfaction will be evaluated using BREAST-Q© version 2.0 BCT-module after a minimum of 3 months of surgery [8]. Satisfaction with breasts postoperatively and physical well-being with chest wall will be assessed (Annexures 2 and 4). Interpretation of both scales are provided as Annexures 3 and 5 respectively.

The BREAST-Q© is an established tool used to study the impact and effectiveness of breast surgery from patient's perspective and is the intellectual property of Drs. Andrea Pusic, Anne Klassen and Stefan Cano. The BREAST-Q© is owned by Memorial Sloan Kettering Cancer Center and The University of British Columbia (Copyright ©2012, Memorial Sloan Kettering Cancer Center and The University of British Columbia). It fulfills the Rasch and traditional psychometric criteria making it a new, cost-effective and analytic patient centered satisfaction measuring tool for breast surgery used worldwide [9]. License to use BREAST-Q© has been acquired. The scales have been translated in Urdu after seeking permission from the copyright holders. A stringent step by step translation guideline has been followed using an excel sheet workbook provided by the authors involving 3 translators and cognitive debriefing has been performed with 5 patients. The Urdu translation of both scales in Annexures 2 and 4 is provided as Annexures 6 and 7 respectively along with their corresponding interpretations.

DATA COLLECTION

Data on flap dimensions, location of perforators, location of tumor and its size, size of breast defect after tumor excision, operative time, number and duration of drains placed, duration of hospital stay and any morbidity will be collected by a member of research team from patient's medical records. Location of perforators will be determined in relation to the breast meridian, infra-mammary fold and lateral breast curve as defined by the primary surgeon. Data will be collected on a pre-designed form by the researcher (Annexure 1). Patients will fill the questionnaires for cosmetic outcomes and satisfaction only once during their routine follow-up in clinic after a minimum of 3 months of surgery (Annexures 2 and 4 for English, Annexures 6 and 7 for Urdu) which will require less than 10 minutes of their time. Hard copies of the data will be stored in a locked cupboard of primary researcher's office after entering in SPSS. Data will be stored with the primary researcher for 7 years after completion of study.

ETHICAL CONSIDERATIONS

Approval to conduct the study is taken from the Departmental Review Committee (DRC) and institutional Ethical Review Committee (ERC) of The Aga Khan University Hospital, Karachi. Patients will be approached for 2 consents: one for their cosmetic outcomes and satisfaction survey and second for the pictures of their breasts. Written and informed consent in English or Urdu will be obtained by the researcher (PI / co-PI) in breast clinic from all study subjects visiting AKUH for their routine follow-up for the patient satisfaction survey after explaining them the purpose of study (Annexure 8 and 10). Hard copies of the proformas will be handed over to them in their preferred language (English or Urdu) after their agreement to participate (Annexures 2 and 4 for English, Annexures 6 and 7 for Urdu). Patients will select the most appropriate answers from the list of provided options for themselves. If any patient is unable to read, her attendant will assist her, otherwise the researcher will read the questions and their options to her one by one. A separate consent for breast photographs of selected cases will also be taken by PI / co-PI at the same time (Annexures 9 and 11). The pictures will demonstrate tumor location, flap designs and final outcomes of breasts and scars for publication after concealing all patient identifiers. The patients can refuse for photographic consent and still participate in the satisfaction survey. Pictures of consenting patients will be taken in breast clinic's treatment room by PI following a standard protocol i.e., bilateral front, oblique and lateral views and shown to patients before finalization. All unnecessary / out of focus pictures will be immediately deleted. No identification marks will be included in the pictures. All pictures will be coded

and stored in a password protected folder / passport drive in PI's office desktop along with other data from the study for 7 years. The process of obtaining consent will take 2 to 3 minutes.

Use of the BREAST-Q Questionnaire, authored by Drs. Klassen, Pusic and Cano, was made under license from Memorial Sloan Kettering Cancer Center, New York, USA.

ANALYSIS

The analysis will be done on Statistical Package for Social Sciences (SPSS version 24). Descriptive quantitative variables such as operative time will be reported as mean ± SD/ median (IQR) depending upon the normality of the data. For qualitative variables such as location of perforators, flap dimension, cosmetic outcomes and patient satisfaction, frequency and percentages will be reported. Content validation index (CVI) will also be reported.

STRENGTHS OF THE STUDY

This study is a review of our initial clinical experience with pedicled perforator flaps in partial breast reconstruction which has been recently adopted in our institution. No work on pedicled perforator flaps in partial breast reconstruction has been published from Pakistan as yet to the best of our knowledge.

LIMITATIONS OF THE STUDY

Single institution experience with limited number of cases will limit the generalizability of the study results.

STUDY IMPLICATIONS

This study will determine the technical outcomes of a relatively new partial breast reconstruction technique which will help in disseminating the knowledge from our part of the world and will help in training more surgeons for adapting this skill for our women population. It will also evaluate the patient's perspective and help in improving our techniques if any shortcomings are identified.

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CONFLICTS OF INTEREST

None

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None