The American Journal of Surgery (2017) 213, 1116-1124

The American Journal of Surgery®

Nipple-sparing mastectomy using a hemi-periareolar incision with or without minimal medial-lateral extensions; clinical outcome and patient satisfaction: A single centre prospective observational study

Hiba El Hage Chehade, M.D., M.R.C.S., Hannah Headon, M.B.B.S., B.Sc., Umar Wazir, M.B.B.S., M.R.C.S., M.Sc., Amtul R. Carmaichael, M.D., F.R.C.S., Christina Choy, Abdul Kasem, M.D., F.R.C.S., Kefah Mokbel, M.S., F.R.C.S.*

The London Breast Institute, Princess Grace Hospital, London, UK

KEYWORDS:
Nipple-sparing mastectomy;
Periareolar incision;
Breast cancer;
Immediate breast reconstruction

Abstract

BACKGROUND: Nipple-sparing mastectomy (NSM) is becoming a viable oncoplastic option. There is debate regarding the best approach that balances oncological safety with aesthetics. In this study, we describe an approach involving a hemi-periareolar incision and evaluate its safety and outcomes.

METHODS: Patients treated at single center between 2012 and 2015 were observed prospectively. After a histologically negative subareolar biopsy, immediate reconstruction with implant and acellular dermal matrix was performed after NSM. Primary end points were wound complications and explantation. Secondary end points included local recurrence, quality of life, patient satisfaction, and esthetic outcome.

RESULTS: Sixty-three patients were included with 92 procedures. Twenty-seven percent received chemotherapy and 12.7% received radiotherapy. Mean follow-up was 27.6 months. There were only 2 wound complications, and no recurrences. Mean outcome scores were promising (Breast Q = 88%, subjective esthetic = 9.2, objective esthetic = 9.3, hardening = 2.6).

CONCLUSIONS: NSM via a hemi-periareolar incision is oncologically safe with a low-complication rate and high patients' satisfaction.

Nipple-sparing mastectomy (NSM) was pioneered by Freeman in 1962 but abandoned thereafter due to a high rate of complications and questionable oncological safety,[1,2] then introduced as a case report at the Southwestern Surgical Congress in 1999, followed by an editorial in 2000.[3] Its combination with immediate breast reconstruction (IBR) has, in recent years, gained popularity for both therapeutic and prophylactic indications.[4] With one-

The authors declare no conflicts of interest.

Informed consent was obtained from all individual participants included in the study.

* Corresponding author. Tel.: +44 (0) 207 079 4344; fax: +44 (0) 207 908 2275.

E-mail address: kefahmokbel@hotmail.com

Manuscript received March 24, 2016; revised manuscript April 11, 2016

0002-9610/$ - see front matter © 2016 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.amjsurg.2016.04.016

third of women still requiring mastectomy, the concept of "conservative" mastectomy has emerged whereby the breast parenchyma along with the tumor are removed while preserving the skin envelope.[5] The preservation of the nipple-areola complex (NAC) in NSM renders this procedure not only as the most conservative method but also as the most aesthetically appealing as it ensures a natural-looking nipple. Psychological research demonstrates the importance of the NAC to women where its loss may cause worse psychological distress than losing the entire breast mound.[6]

Modern reconstructive surgery is driven by 2 goals: to achieve an oncologically safe outcome while maintaining the best esthetic outcome.[7] Studies have demonstrated that NSM with IBR is an oncologically safe procedure, with minimal postoperative complications.[8–12] The main surgical concerns are the risk of NAC ischemia due to interruption of the blood supply and the compromised dissection due to inadequate visualization. With this in mind, it is vital to plan incisions beforehand to minimize vascular impairment to the skin and nipple.[8] The choice of an optimal incision is still the subject of debate. Sacchini et al[13] described 4 types of incisions: a periareolar incision with lateral extension, a transareolar incision with perinipple and lateral-medial extension, a transareolar and trans-nipple incision with medial and lateral extension, and an inferior or lateral mammary incision. In this study, we describe a technique using a superior or inferior hemi-periareolar incision with or without short medial-lateral extensions and report surgical, oncological, and esthetic outcomes and patient satisfaction. Our approach is driven by the following advantages: excellent tissue exposure, adequate dissection under direct visualization, direct access to the retroareolar tissue for histologic analysis, and finally, superior esthetic advantages due to minimizing future NAC malpositioning (usually seen with lateral extensions) when the medial and lateral extensions are used, and minimizing additional future scaring occasionally required by future periareolar mastopexy or NAC excision in cases of positive retroareolar biopsies.

Methods

This is an observational review of patients who had undergone NSM via a superior or inferior hemi-periareolar incision with immediate implant-based reconstruction by an experienced oncoplastic breast surgical team at the London Breast Institute between 2012 and 2015. Reconstruction was either performed using silicone-based implant (single-staged reconstruction) or an expandable implant followed by silicone-based implant at a later stage (2-staged reconstruction). Inclusion criteria comprised adult female patients scheduled to undergo NSM performed through a superior or inferior hemi-periareolar incision with immediate implant-based reconstruction for either therapeutic or risk-reducing purposes. Patients were excluded if they had inflammatory breast cancer, extensive skin involvement, significant comorbidity, body mass index (BMI) greater than 25, clinical Paget's disease, malignant nipple discharge, and biopsy proven malignancy in the retroareolar region or if breast imaging such as MRI demonstrated nipple involvement. Other incisions for NSM include inframammary incisions (usually due to patient preference) or incisions through previous scars.

Sixty-three patients undergoing a total of 92 NSMs and IBR procedures through a hemi-periareolar incision were identified. The follow-up protocol consisted of weekly follow-up for 4 weeks, followed by 3-month and then 6-month clinical examinations. Patients were followed up for a mean duration of 27.6 months (median 29 months, range 13 to 56 months). All procedures were prospectively analyzed.

All patients gave their informed consent to participate in the study. Informed consent was also given for clinical photographs to be used for academic purposes.

The primary end points were the local wound complication and explantation rates. Secondary end points included local recurrence, the impact of the reconstruction on patient quality of life, patient satisfaction with the esthetic outcome, and an objective assessment of the esthetic outcome. The quality of life was assessed using the Breast Q Questionnaire, a method of assessing patient-reported outcomes to study the effectiveness and impact of breast surgery from the perspective of the patient.[14] This was posted out to patients following their surgery and can be seen in Fig. 1. The crude Breast Q score, which was out of 60, was calculated and converted into percentage. Results were then further classified as very satisfied, satisfied, and dissatisfied as seen in Table 1. Patients were also asked to complete a patient satisfaction questionnaire to assess the esthetic outcome of surgery subjectively, which was scored between 0 and 10, where 10 indicated a good esthetic outcome and 0 indicated a poor outcome. In addition, an objective assessment of esthetic outcome was judged by an independent observer using a visual analogue scale from 0 to 10. This assessment was based on the Harvard scale described by Harris et al[15] for the assessment of esthetic outcome after primary radiotherapy for early breast cancer. In our modified scale, scores of 9 to 10 count as excellent (symmetrical with no apparent distortion), 7 to 8 as good results, 4 to 6 as fair, and less than 4 as poor results (with major distortion and asymmetry). Capsular contracture formation was assessed using a subjective assessment of severity of hardening as a surrogate marker, again using a visual analogue scale scored by an independent observer between 0 and 10, where 10 indicated severe hardening and hence capsular contracture formation.

Surgical technique

Under general anesthesia, the patient is placed in supine position with the ipsilateral arm abducted 90°. A superior or inferior hemi-periareolar incision with or without medial and lateral extensions of 5 to 10 mm is performed. The