



Batwing-shaped de-epithelialization technique: a case report

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For women with extremely ptotic breasts, achieving optimal aesthetic outcomes with implant-based breast reconstruction following nipple-sparing mastectomy presents significant challenges. Traditional mastopexy designs may be considered; however, they often lead to nipple-areola complex necrosis due to inadequate blood supply. We propose a novel approach to breast reconstruction that involves skin de-epithelialization to minimize excess mastectomy skin flap, combined with simultaneous contralateral reduction mammoplasty. This technique effectively preserves circulation to the nipple-areola complex while delivering satisfying aesthetic results, offering a viable solution for managing the complexities associated with large, ptotic breasts in patients undergoing nipple-sparing mastectomy.

Keywords Mastectomy / Nipples / Mammoplasty / Esthetics / Case reports

INTRODUCTION

For women with large and ptotic breasts, achieving optimal aesthetic outcomes with implant-based breast reconstruction following nipple-sparing mastectomy presents significant challenges [1-5]. The removal of excessive skin tissue can impair blood circulation to the mastectomy skin flap, and achieving symmetric positioning of the nipple-areola complex is further complicated by its typically ptotic shape and size [1,2,4,5]. Although various novel incision designs aimed at preserving the glandular pedicle are routinely attempted in reduction mammoplasty, most of these techniques are unsuitable for mastectomy skin flaps, as all glandular tissues are removed during the oncologic procedure [6]. Additionally, patients with large and ptotic breasts often desire contralateral reduction to alleviate symptoms of macromastia, such as neck pain,

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shoulder pain, back pain, and intertrigo [7]. Considering these factors, this case report aims to introduce a unilateral, successful skin de-epithelialization design that effectively reduces excessive breast skin flap while preserving circulation in the nipple-areola complex during immediate breast reconstruction in a nipple-sparing mastectomy patient undergoing simultaneous contralateral reduction mammoplasty.

CASE REPORT

A 42-year-old woman with right breast cancer underwent immediate implant-based reconstruction following nipple-sparing mastectomy. Preoperatively, she exhibited grade 3 ptosis and a slightly larger right breast. She also expressed a desire for a concomitant contralateral reduction (Fig. 1). Our surgical plan included nipple-sparing mastectomy with an inferolateral radial incision on the right breast and an inferior pedicle reduction mammoplasty on the left breast. The patient underwent the nipple-sparing mastectomy as planned, with the mastectomy specimen weighing 913 g. Immediately following the surgery, indocyanine green angiography was utilized to evaluate the viability of the mastectomy flap and the nipple-areola complex, which showed slightly compromised perfusion around the nipple. A contralateral reduction mammoplasty was then performed using an inferior pedicle technique, resulting in a reduction mammoplasty specimen weighing 87 g. A 450-cc temporary silicone sizer was inserted into the right prepectoral breast pocket.

The patient was then positioned upright. The batwing pattern was designed to reduce excessive skin in the upper pole as follows (Fig. 2): Initially, a semicircular marking was made along the upper margin of the nipple-areola complex with medial and lateral extensions. The right nipple-areola complex was temporarily fixed with a skin stapler to ensure precise alignment at the same height as the contralateral side, followed by a new semicircular marking at the upper margin. Radial extension lines were carefully drawn in medio-oblique and latero-oblique directions, sharply connecting to the previously drawn extensions to prevent dog-ear deformity, thus completing the batwing shape. The skin area forming the batwing design was then de-epithelialized, and pinpoint bleeding from the de-epithelialized dermis confirmed the circulation of the mastectomy flap. After replacing the sizer with a 450 cc MemoryGel silicone implant (Mentor smooth round moderate plus profile; Mentor Worldwide LLC) covered with acellular dermal matrix (20 × 20 cm;

MegaDerm, L&C BIO Inc.) in the prepectoral plane, the upper and lower margins of the resulting dermis were approximated to symmetrically relocate the nipple-areola complex (Fig. 3). During the initial week after the operation, slight congestion was observed at the superolateral area of the nipple-areola complex, but the wound healed naturally without further complications. By postoperative day 7, the entire mastectomy flap, including the nipple-areola complex, had survived (Fig. 4). Seven months post-treatment, the areola area on the reconstructed right breast had slightly increased (Fig. 5), which the patient found acceptable; she was satisfied with the overall surgical outcome.

DISCUSSION

The nipple-areola complex is crucial in determining breast symmetry. However, following a nipple-sparing mastectomy, the nipple

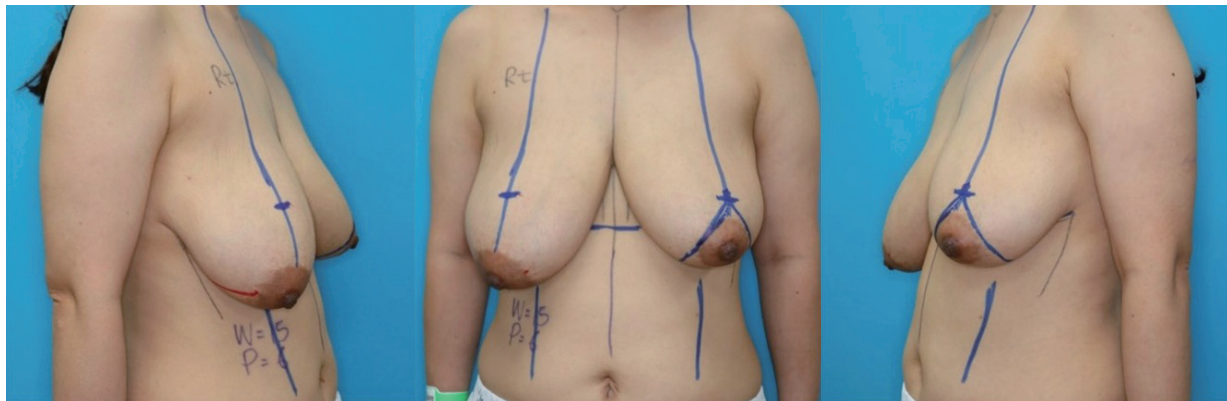


Fig. 1. Preoperative photos showing skin markings for the batwing-shaped de-epithelialization technique.

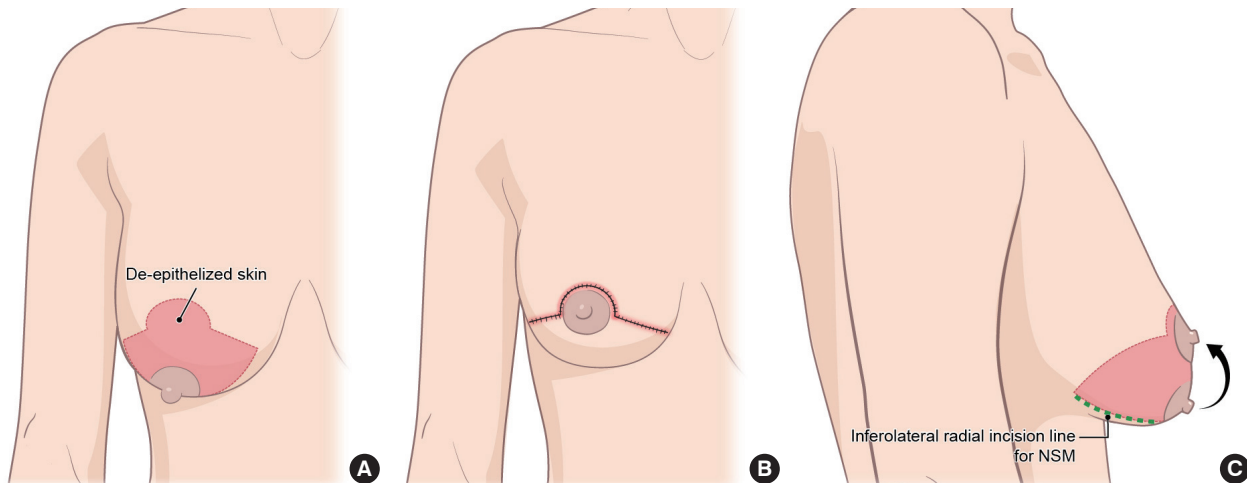


Fig. 2. Schematic illustration demonstrating (A) the de-epithelialized skin area of the batwing design and (B) the elevation of the nipple-areola complex after the breast reshaping procedure. (C) The lateral view illustrates the change in the position of the nipple-areola complex before and after reconstruction. The green dotted line indicates the inferolateral radial incision line design used during the nipple-sparing mastectomy (NSM).



Fig. 3. Immediate postoperative photograph showing the batwing-shaped de-epithelialization technique and contralateral breast reduction.

tip can experience insufficient blood supply, potentially leading to necrosis [4,5]. According to Rossi et al. [4], nipple necrosis occurs in up to 20% of cases, with severe cases necessitating surgical intervention such as debridement and repair, inevitably leading to breast asymmetry and poor aesthetic outcomes. Although the anatomical contraindications for nipple-sparing mastectomy are not well-defined, patients with larger breasts or moderate to severe ptosis are often deemed unsuitable candidates. This is due to the increased risk of ischemic complications, challenges in managing an excessive skin envelope, and the likelihood of poor aesthetic outcomes [2,3].

Unilateral breast cancer patients with large and ptotic breasts often opt for simultaneous breast reduction during immediate implant-based reconstruction. In such cases, it is crucial to perform mastopexy carefully to maintain the circulation of the nipple-areola complex while achieving adequate skin reduction. Current methods for reconstructing ptotic breasts in patients undergoing nipple-sparing mastectomy include concurrent mastopexy and a staged approach [8-11]. A recent study by Hammond and Little [12] in-

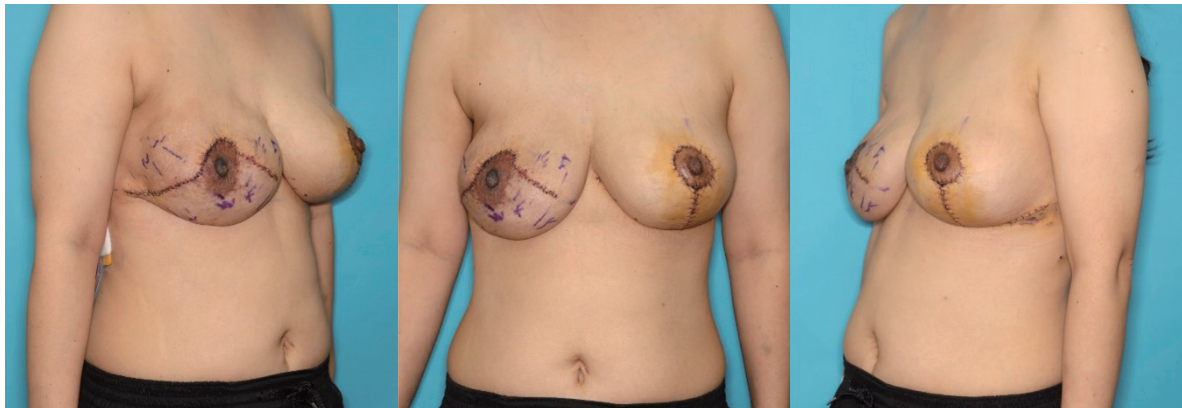


Fig. 4. One-week post-operation. The overall symmetry and circulation of the nipple-areola complex were well preserved.



Fig. 5. Seven months post-operation, the areola on the right breast has slightly enlarged, but the patient found this acceptable and was satisfied with the overall surgical outcome.

roduced a two-stage immediate breast reconstruction technique with pre-mastectomy mastopexy for patients with significant ptosis undergoing nipple-sparing mastectomy. Although this strategy may lower the risk of flap or nipple-areola complex necrosis, it requires delaying breast cancer management by approximately 8 weeks. While this delay may be acceptable for patients undergoing mastectomy as a prophylactic measure, a more efficient and timely protocol is necessary for active breast cancer cases. Furthermore, this strategy necessitates two separate surgical procedures, increasing the risks associated with anesthesia, complications, hospital stays, and overall costs [9,10].

Kadakia et al. [6] demonstrated that with careful patient selection, simultaneous batwing mastopexy can be safely performed in patients undergoing nipple-sparing mastectomy and immediate implant-based breast reconstruction. They observed a skin or nipple necrosis rate of 6.3% in 80 concurrent batwing mastopexy operations, compared to 11.5% in 244 standard implant-based reconstructions. Although previous literature has described the advantages of batwing mammoplasty, those studies primarily focused on outcomes in cases of bilateral mastectomy with immediate reconstruction [6,13-15].

As far as we are aware, this case report is the first to describe the use of batwing mastopexy to achieve symmetry in conjunction with contralateral breast reduction. In the process of performing reduction mammoplasty on the opposite breast, the nipple-areola complex is resized, which may alter measurements such as the nipple-to-inframammary fold distance and the sternal notch-to-nipple distance. These changes pose additional challenges in achieving symmetry between the breasts. However, this case study shows that batwing mastopexy can effectively restore balance with the reduced breast. Additionally, because the entire mastectomy skin is preserved except for the radial incision, any necessary adjustments, such as reducing the lower pole skin or resizing the areola, can be safely managed through de-epithelialization of the inframammary fold and peri-areolar skin.

In conclusion, this case report presents a unilateral batwing-shaped de-epithelialization technique for breast reconstruction after nipple-sparing mastectomy, which can achieve satisfactory outcomes even when a simultaneous contralateral reduction mammoplasty is desired. This method effectively preserves the circulation of the nipple-areola complex while delivering pleasing aesthetic results, providing a viable approach to addressing the challenges associated with large and ptotic breasts in patients undergoing nipple-sparing mastectomies. Further carefully planned prospective research and refinement of these techniques are necessary to broaden surgical outcomes and expand the pool of candidates eligible for this procedure.

NOTES

Conflict of interest

No potential conflict of interest relevant to this article was reported.

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Patient consent

The patient provided written informed consent for the publication and the use of images.

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