

Skin-Reduction Breast Reconstructions with Prepectoral Implant

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Summary: Skin-reduction mastectomy with prepectoral implant reconstruction is a novel technique for immediate breast reconstruction, with subcutaneous implant placement in patients eligible for skin-reducing mastectomy. Implants were placed above the pectoralis muscles in a compound pocket made by a dermal flap and acellular dermal matrix. The procedure was performed on 33 breasts in 27 selected patients. In three cases, there was skin ischemia; in one case, it healed spontaneously; and in two patients, a surgical necrosectomy and primary closure were needed. No implant loss occurred. This new technique proved to be a useful alternative, with good cosmetic results, in selected patients requiring mastectomy. These preliminary results need to be confirmed by long-term and comparative studies. (*Plast. Reconstr. Surg.* 137: 1702, 2016.)

CLINICAL QUESTION/LEVEL OF EVIDENCE: Therapeutic, IV.

Over the years, different techniques to improve aesthetic and functional results in breast reconstruction have been introduced. Nowadays, prosthetic breast reconstruction promotes the shift from a traditional two-stage operation to a single-stage procedure.¹⁻³

The skin-reducing mastectomy was introduced several years ago for single-stage (direct-to-implant) reconstruction of large and ptotic breasts. It is considered an oncologically safe procedure, giving excellent cosmetic results.^{2,4-9}

The use of acellular dermal matrix in breast surgery is widely described in the literature for the reconstruction of the inferior and lateral parts of the implant pocket and for the treatment of capsular contracture after aesthetic surgery.¹⁰⁻¹³ Recently, acellular dermal matrix has been used even as an envelope for the implant to provide an alternative to subpectoral implant placement.^{14,15} This study presents an original technique, the skin-reduction breast reconstruction with prepectoral implant, to be used as an alternative to the skin-reducing mastectomy.

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PATIENTS AND METHODS

From March of 2013 to March of 2015, we performed this innovative technique in 27 selected patients who required mastectomy and immediate reconstruction and respected the following reconstructive and oncologic criteria: localized breast carcinoma (inflammatory breast cancer was excluded) and prophylactic mastectomy. Reconstructive inclusion criteria were large and ptotic breasts with a pinch test greater than 2 cm. Exclusion criteria were intraoperative or postoperative radiotherapy, diabetes, and heavy smoking. This study followed the Declaration of Helsinki on medical protocols and ethics, and the ethical review board of our institution had already approved the use of acellular dermal matrix for breast reconstruction.

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Materials

All reconstructions were performed with silicone gel anatomical implants (Natrelle 410; Allergan, Inc., Irvine, Calif.), permanent silicone-saline anatomical implants (Natrelle 150; Allergan), and porcine-derived acellular dermal matrix (Native; MBP, Neustadt-Glewe, Germany) measuring 180 × 100 × 0.6 mm.

Surgical Technique

A written informed consent document was signed by each patient. Accurate preoperative drawings were made according to the conventional Wise-pattern method (Fig. 1). (See **Video, Supplemental Digital Content 1**, which demonstrates how skin-reduction breast reconstruction with prepectoral implant is a novel technique for immediate breast reconstruction with subcutaneous implant placement in patients eligible for skin-reducing mastectomy. Implants were placed above the pectoralis muscles in a compound pocket made by a dermal flap and acellular dermal matrix, available in the “Related Videos” section of the full-text article on PRSJJournal.com or, for Ovid users, available at <http://links.lww.com/PRS/B709>.) Perioperative antibiotics were given (cefazolin 2 g) 30 minutes before the surgical incision. The mastectomy and the lymph node surgery were performed through the wide incision, with preservation of the dermal flap of the lower pole that had already been deepithelialized. A combined dermal pocket was created using the inferior dermal flap, sutured with a patch of acellular dermal matrix to continue its extension until the upper pole, to cover the anatomical implant (Fig. 2).

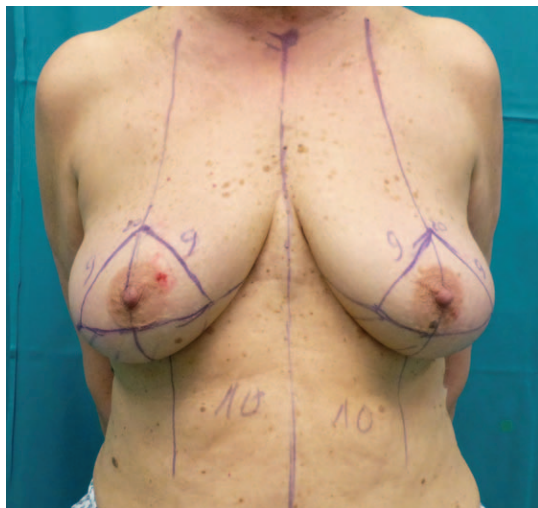


Fig. 1. Preoperative markings.



Video. Supplemental Digital Content 1 demonstrates how skin-reduction breast reconstruction with prepectoral implant is a novel technique for immediate breast reconstruction with subcutaneous implant placement in patients eligible for skin-reducing mastectomy. Implants were placed above the pectoralis muscles in a compound pocket made by a dermal flap and acellular dermal matrix, available in the “Related Videos” section of the full-text article on PRSJJournal.com or, for Ovid users, available at <http://links.lww.com/PRS/B709>.

The pocket was closed laterally to define the inframammary fold by suturing the dermal flap to the fascia of the serratus anterior. The upper edge of the acellular dermal matrix was then fixed with resorbable sutures to the anterior fascia of the pectoralis major. The skin was closed in the inverted-T fashion after a drain was placed into the pocket.

When oncologically possible (i.e., tumor-to-nipple-areola complex distance was >2 cm on magnetic resonance imaging and the fresh-frozen retroareolar biopsy results were negative), the nipple-areola complex, harvested as a full-thickness

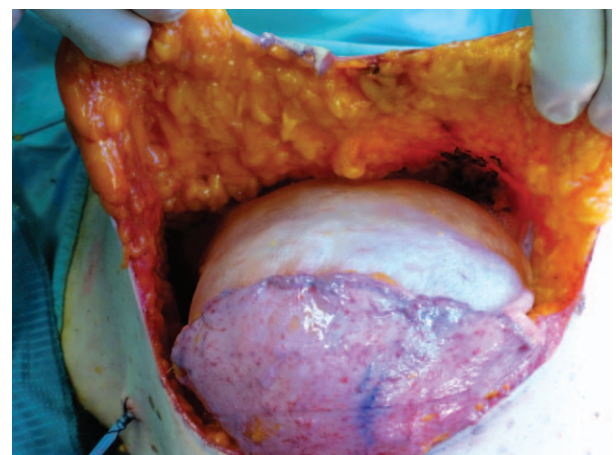


Fig. 2. Breast implant inside the compound pocket.

Table 1. Results of the Study

Characteristic	Value
Total no. of patients	27
Total no. of breasts	33
Reconstruction, no.	
Unilateral	21
Bilateral	6
NAC graft, no. of breasts	22
Nipple flap and contralateral areola graft, no. of breasts	11
Patient age, yr	
Mean	51.06
Range	37–66
Implant's medium size, g	410.37
Mean hospital stay, days	3.5
Follow-up, mo	
Median	14.7
Range	6–24
No. of complications	
Superficial skin deepithelialization at the inverted-T edges (spontaneous healing)	1
Full-thickness skin necrosis at the inverted-T edges (surgical necrosectomy and primary closure)	2
Implant loss	0
Perioperative infections	0

NAC, nipple-areola complex.

skin graft (and preserved in saline solution), was grafted to the new position. Otherwise, the nipple was reconstructed with local flaps and the areola grafting was part of the contralateral one.

RESULTS

Skin-reduction breast reconstruction with prepectoral implants was performed on 33 breasts in 27 women (six bilateral and 21 unilateral) with large and ptotic breasts. In the unilateral cases, a breast reduction (20 patients) or a mastopexy was performed on the opposite breast. A synoptic table of the results summarizes the collected data (Table 1).

DISCUSSION

The single-stage reconstruction with acellular dermal matrix and implants has been well established: the prosthesis is placed inside a pocket composed of the pectoralis major muscle in the upper part and acellular dermal matrix in the lower pole.^{12,13} For large and ptotic breasts, Nava et al. described the skin-reducing mastectomy in which the dermal autologous flap composes the lower pole of the submuscular pouch, thus replacing the acellular dermal matrix.^{6,7}

Recently, a new impetus has also been given to breast reconstruction with subcutaneous placement of implants in patients with an adequate pinch test (i.e., >2 cm) in the upper pole of the breast.^{1,2,8} In our preliminary report, the positioning of the implant into the composed dermal flap–acellular dermal matrix pocket, created solely in a subcutaneous plane, seems to reduce the postoperative pain and discomfort caused by the dissection of the pectoralis major muscle and maintains a good cosmetic outcome without any dynamic distortion of the implant. Furthermore, this technique allows a possible back-up operation with the traditional techniques if needed. Moreover, use of the acellular dermal matrix allows custom-made coverage of the anatomical silicone implant, to prevent the risk of implant rotation. In addition, in this series, the patients rapidly recovered arm mobilization, and were discharged in a timely manner, with quicker return to everyday life.

All patients eligible for skin-reduction mastectomy with prepectoral implant reconstruction have large breasts and are stout: the upper profile of the implant is therefore hidden by a thick skin



Fig. 3. (Left) Frontal view obtained preoperatively. (Right) Frontal view obtained 2 months postoperatively.

flap. If necessary, a secondary lipofilling procedure around the implant may be performed.

Furthermore, Wise-pattern mastectomy is characterized by a high rate of surgical complications: the main problems are related to the stress and tension sustained by the two long flaps (from 7 to 9 cm long) at the inverted-T suture point.^{9,16,17} Sometimes, this causes wound dehiscence and exposure of the implant, leading to its removal.¹³ In our series, all patients experienced good healing except for three patients that had skin ischemia at the inverted-T edges, without developing any implant loss or infections. This could probably be attributable to the limited number of patients enrolled and their accurate selection.

The goal of breast reconstruction is always to yearn for less invasive methods with even better results. The use of the skin-reduction mastectomy with prepectoral implant reconstruction on a selected group of patients in this preliminary report has shown good results in terms of aesthetics, effectiveness, manageability, and hospitalization (Fig. 3). New, long-term, comparative studies, with a larger number of patients, are needed to better define the accuracy of the indications and the limits of this new surgical technique.

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