Repairing the High-Riding Nipple with Reciprocal Transposition Flaps

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Summary: The high-riding nipple-areola complex is a clinical problem that can be encountered following cosmetic and reconstructive breast surgery. Because of the desire to avoid scars on the superior aspect of the breast and the limited availability of superior breast skin, it can be technically challenging to place the nipple-areola complex in a lower position. Multiple surgical strategies have attempted to lower it, and each has its advantages and disadvantages. Reciprocal rotation flaps have been used by the authors with success. They describe the surgical technique and outcomes in five breasts. The medical records of all patients who had reciprocal rotation flaps for high-riding nipple-areola complexes performed by the senior author (S.L.S.) were reviewed. The institutional review board–approved review included preoperative history and examination, surgical findings, surgical technique, and postoperative course. Five reciprocal rotation flap procedures were performed on four patients between 2005 and 2012 for high-riding nipple-areola complexes. The high-riding nipple-areola complexes were all iatrogenic, following reconstruction for nipple-sparing mastectomy or mastopexy. All nipple-areola complexes were successfully lowered with an average follow-up duration of 2.1 years. One breast that had undergone previous radiation therapy had a nipple-areola complex flap that appeared ischemic; the patient underwent hyperbaric oxygen therapy and the flap fully survived. Reciprocal rotation flaps are an effective strategy for management of the high-riding nipple-areola complex and can be safely performed with thoughtful planning and careful surgical technique. This technique is riskier in the irradiated breast but may be facilitated with hyperbaric oxygen therapy. (Plast. Reconstr. Surg. 131: 687, 2013.)

PATIENTS AND METHODS

All patients who have had reciprocal transposition flaps performed for high-riding nipples by the senior author (S.L.S.) were reviewed retrospectively following institutional review board approval. Clinical information that was collected from patient charts includes patient history, intraoperative findings, and postoperative care.

Preoperative Planning

The surgical plan is designed with the patient upright. The current nipple and areola are marked and the desired nipple location identified with a surrounding outline for the areola to ensure

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the two areolar outlines are adjacent. The flaps are then marked such that the blood supply of the nipple-areola complex–carrying flap is maximized; previous scars are noted, given that all patients had previous breast surgery.

Operative Technique

In the operating room, local anesthetic is infiltrated. The flaps are sharply cut with a scalpel blade and cautery is kept to a minimum. If there is an underlying implant, the flap edges are taken down nearly to the level of the capsule, at which point the edge is carefully retracted with skin hooks and the flaps dissected sharply away from the capsule with a scalpel blade. The least amount of undermining that allows flap transposition is then performed. Once the flaps are raised and transposed, they are sutured in place with a few buried dermal absorbable monofilament sutures, followed by running or interrupted permanent monofilament cuticular sutures. Any standing cones (dog-ears) are left, to avoid compromise of flap perfusion. The flaps are covered with antibiotic ointment and gauze.

Postoperative Details

Patients are seen within 1 or 2 days of surgery. If the flaps show any evidence of ischemia, the patient may be referred for hyperbaric oxygen therapy. Once the incisions heal, the sutures are removed. The standing cones will often flatten within several months; if not, they can be surgically revised at a later date.

RESULTS

Reciprocal transposition flaps were performed on five breasts in four patients between 2005 and 2012 for high-riding nipple-areola complexes. Each of the patients previously had breast surgery resulting in a clinically significant high-riding nip-
ple-areola complex as determined by the senior plastic surgeon and patient.

The average age of the patient at the time of the transposition flap surgery was 49.8 years (range, 44 to 57 years) and the average body mass index was 24.2 kg/m² (range, 21.5 to 29.6 kg/m²). Each patient had between two and four previous operations on the affected breast. Three of the four patients had breast cancer treated with nipple-sparing mastectomies and device-based reconstruction; the fourth patient, in whom both breasts had high-riding nipples, had a previous cosmetic mastopexy. One of the four patients had previously undergone breast radiation therapy.

The transposition flap operations successfully placed the nipple-areola complexes in a more preferable location for all five breasts. The average follow-up duration was 2.1 years (range, 68 days to 5.4 years). All of the flaps survived without infection, device exposure, or explantation. One patient, who previously had irradiation of the breast, had transient flap ischemia that was salvaged with hyperbaric oxygen therapy. No other complications were encountered.

A 52-year-old woman underwent a nipple-sparing mastectomy for left breast-infiltrating ductal carcinoma with immediate reconstruction using a tissue expander and AlloDerm acellular dermal matrix (LifeCell Corp., Branchburg, N.J.) (Fig. 1). Four months later, the tissue expander was exchanged to an implant (Style 20 smooth, round silicone implant, 800 cc). Despite the overall excellent reconstructive outcome, the nipple-areola complex was displaced superiorly (Fig. 1, above, left). The surgical plan was to relocate the nipple-areola complex by rotating it into a lower position using a transposition flap (Fig. 1, above, right). A medially based flap containing the nipple-areola complex was raised in a plane directly superficial to the implant capsule; a second laterally based flap was similarly raised, and the two flaps were transposed (Fig. 1, below, left). Flaps were sutured in place, with standing cones (dog-ears) minimally trimmed to maximize flap perfusion. The patient had no postoperative complications after 10 weeks of follow-up; a photograph after 1 month is presented (Fig. 1, below, right).

**DISCUSSION**

A high-riding nipple-areola complex can occur following breast reconstruction, mastopexy, or breast reduction. Difficulty in managing the high-riding nipple results from the fixed distance between the nipple and the sternal notch. We present the reciprocal transposition flap as an alternative option for addressing the high-riding nipple-areola complex in the carefully selected patient. Indeed, other authors have published case reports describing similar strategies that successfully lowered the high-riding nipple-areola complex.3–5 As with our experience, these case reports generally describe iatrogenic high nipple-areola complexes following reoperation or following nipple-sparing mastectomy.

Three technical points need to be emphasized in the performance of the reciprocal transposition flap. First, flap elevation is performed in the deep subcutaneous plane—just superficial to the capsule. Manipulation should be sharp and minimally traumatic. Second, the flaps should be rotated and inset with as little tension as possible. Consequently, trimming of standing cones (dog-ears) should be avoided or minimized to preserve flap perfusion. Third, this procedure should be approached with caution in the irradiated patient. Any suggestion of flap ischemia in the postoperative period may benefit from hyperbaric oxygen therapy to improve flap perfusion.

The high-riding nipple-areola complex is a clinical entity that is easily detected by the patient and surgeon alike; however, it remains difficult to correct. The reciprocal transposition flap that we have described, consistent with earlier reports, is an elegant solution to this anatomical problem. We anticipate that in a setting of current practice patterns favoring nipple-sparing mastectomies and revision mastopexies, the high-riding nipple will become a more frequently encountered complication.

**REFERENCES**