

Review Article

New nipple-sharing technique without damaging breastfeeding functionality of donor site, and spiral graft to Reconstructed Breast area

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INTRODUCTION

Reconstruction of a symmetrical and proportional Nipple-Areola Complex (NAC) on a reconstructed breast mound is the finishing touch on breast reconstruction following breast cancer excision. Established NAC reconstruction techniques include nipple-sharing techniques and local flap techniques. In some cases of implant reconstruction, local flap techniques can result in implant exposure or flap necrosis, as the subcutaneous tissue underlying the ideal NAC position is thin. Nipple-sharing techniques appear to reduce the risk of implant exposure while providing a reconstructed nipple that is similar in color and texture to the original, but can damage the mammary duct and breastfeeding functionality. This motivated us to invent a new nipple-sharing technique for patients who desire to retain breastfeeding functionality of the donor side after NAC reconstruction.

Our technique consists of harvesting the outer layer of the donor site nipple and grafting the tissue according to a spiral method.

METHODS

First, the new NAC area is de-epithelialized. Next, parallel lines are incised around the neck of the donor site nipple without damaging the mammary duct, and only the outer layer of the nipple tissue is harvested. After tissue harvesting, two or three tiny non-overlapping triangles are excised at the cuff of the remaining portion of the donor nipple and at the center edge of the areola. This refinement helps in forming the new neck of the donor nipple, molding the remaining donor nipple tissue into a round shape, and adjusting the donor nipple to a moderate size. Pigmented skin for the new areola is harvested from the labia majora area.

Next, the tissue harvested from the donor nipple is rolled into

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a spiral and grafted at the ideal position. First, the round part of the nipple neck is formed; then the graft tissue is placed, with the raw surface of the tissue contacting the de-epithelialized surface over as large an area as possible. The outermost layer of the nipple is formed by arranging the end of the graft tissue over the round part. Next, pigmented skin is grafted to the de-epithelialized areola area. Finally the grafted NAC is secured with a tie-over suture.

RESULTS

Our nipple-sharing and spiral graft technique was performed on 36 patients. The follow-up periods ranged from 6 to 60 months. (The shape, color and texture of each reconstructed NAC sufficiently matched the contralateral side). All reconstructed nipples retained their projection throughout long-term follow-up. No spiral grafted nipple became necrosis and no another complication.

DISCUSSION

Our nipple-sharing technique consists of harvesting tissue from the outer layer of the donor nipple neck and grafting it in a spiral configuration. For nipple harvesting, we used Lewis's nipple reduction technique [1,2], an established technique that does not damage the mammary duct or destroy breastfeeding functionality. Moreover, the excision of several tiny triangles for refinement purposes allowed us to keep the donor nipple round, curved, moderately-sized, and projecting. Additionally, rolling the tissue into a spiral before grafting it enables us to form the tissue more accurately into a typical nipple shape. Therefore our method is applicable for patients who desire to retain the breastfeeding functionality of the donor nipple after NAC reconstruction.

Our method can be used not only for patients who have undergone breast mound reconstruction with a flap, but also

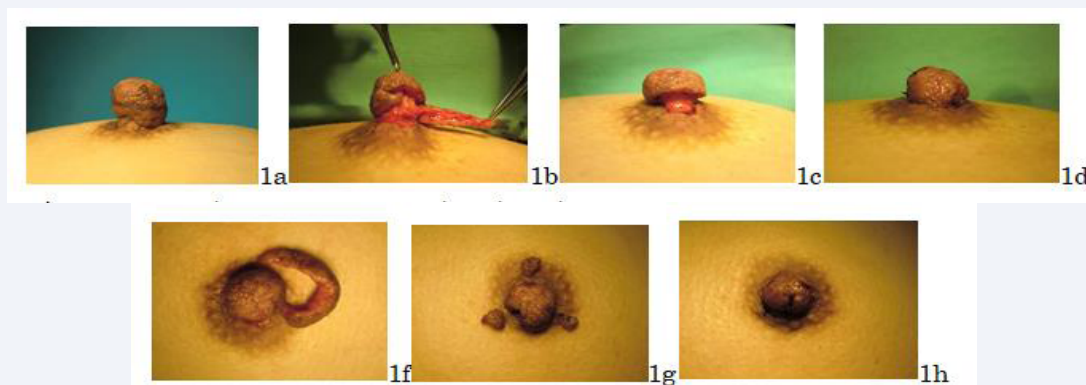


Figure 1 : harvesting from the left-side side nipple outer layer.

1a: marking of around the neck of the donor site nipple

1b: harvesting only the outer layer of the nipple tissue without damaging the mammary duct.

1c: remain the mammary duct,

1d: after closing suture of donor area.

1f: Harvested nipple outer tissue

1g: Three tiny non-overlapping triangles are excised at the cuff of the remaining portion of the donor nipple and at the center edge of the areola.

1h: after closing



Figure 2: Recipient area for reconstruction NAC.

2a: The donor nipple tissue is rolled into a spiral and grafted at the ideal position. The graft tissue is placed, with the raw surface of the tissue contacting the de-epithelialized surface over as large an area as possible.

2b: Molding the remaining donor nipple tissue into a round nipple shape,

2c: Pigmented skin is grafted to the de-epithelialized areola area.



Figure 3: Marking of recipient side.

for patients with an implant. Even if the subcutaneous tissue underlying the ideal NAC position is thin, the nipple-sharing technique enables us to reconstruct a new NAC safely, because nipple-sharing techniques require the removal of only a thin layer for the de-epithelialization of the ideal NAC area.

One limitation of this technique is that it cannot be

recommended for patients whose donor side nipples are unusually small or inverted. We believe that the donor nipple should have a diameter of at least 1cm.

In summary, our nipple-sharing technique consists of harvesting the outer layer of the donor nipple and rolling this tissue into a spiral shape before grafting it. This technique appears to be a useful option for NAC reconstruction in many patients: it can be used after breast mound reconstruction with a flap or with an implant, it allows for the preservation of breastfeeding functionality, and it provides safe and stable results.

This method is called the Sakai's spiral graft in Japan.

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CASE

33 year old woman right-side breast reconstruction of latissimus dorsi M-C flap after breast cancer.

The right NAC was reconstructed by the Sakai's spiral nipple graft harvesting from left-side side nipple outer layer

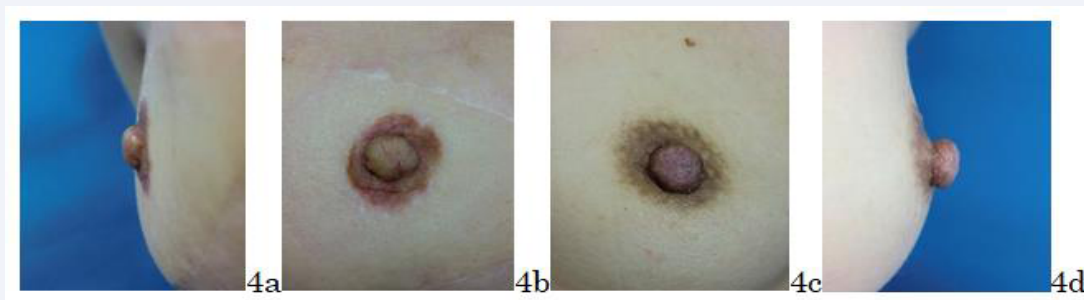


Figure 4: 2 years after the right NAC reconstruction with spiral nipple tissue grafting.
 4a, 4b: view of the reconstructed NAC.
 4c, 4d: the donor side view of harvested nipple outer tissue.

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