

Windmill Flap Nipple Reduction: A New Method of Nipple Plasty

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Abstract

Background Nipple hypertrophy is a common aesthetic issue for Asian women. Thus, methods to correct this problem are needed. Several nipple reduction procedures have been reported, but all have shortcomings. In this article, we propose a new method to reduce both the height and diameter of the nipple without affecting its function.

Methods Sixteen female patients, between the ages of 24–41 years, underwent a new nipple reduction method in our department between May 17, 2010, and May 5, 2014. Three crescent-shaped lines were drawn from the top of the side wall of the nipple, extending to the areola. This design reduces both the diameter and height of the nipple with minimal tissue manipulation.

Results Before surgery, the mean diameter and height of the nipple were 15.9 ± 2.7 and 18.3 ± 3.1 mm, respectively, with the patient in the supine position. Immediately after surgery, the mean diameter and height of the nipple were 9.1 ± 1.7 and 7.9 ± 2.1 mm, respectively. No major complications, such as nipple necrosis, infection, delayed wound healing, or loss of sensation, were noted.

Conclusions This new surgical technique allows the creation of a new nipple of the desired height and diameter with excellent aesthetic results and without significant complications.
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Keywords Nipple hypertrophy · Nipple reduction · Surgical management

Introduction

While rare for Caucasian women, nipple hypertrophy is a common aesthetic issue for Asian women and may present other problems, such as psychological distress and physical discomfort [1–4]. For example, women with this condition may feel embarrassed to wear light clothing on summer days. Additionally, nipple prominence can also lead to physical problems, such as chafing and ulceration.

Presently, the definition of nipple hypertrophy is unclear [2]. Most surgeons agree that the ideal diameter of the nipple is about 1 cm, and the ideal height is less than 0.8 cm [5, 6]. In our experience, nipple hypertrophy always presents bilaterally.

Several techniques have been described for nipple reduction, such as amputation and vertical, cylindrical, and wedge-type resections, but all have shortcomings [5, 7–12]. In this article, we propose a new surgical technique for nipple reduction that provides good aesthetic and functional results.

Materials and Methods

Patients

Between May 2010 and May 2014, 16 female patients (32 nipples) underwent nipple reduction surgery in our

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department using this new technique. The ages of the patients ranged from 24 to 41 years, and all the patients strongly desired to undergo this surgery. Physical examinations showed nipple hypertrophy in all cases (height >0.8 cm, with or without a diameter >1.0 cm).

Every patient was examined and photographed preoperatively and post-operatively. Informed consent was provided by each patient prior to surgery.

Surgical Technique

Preoperative Design

Three crescent-shaped lines were drawn from the top of the side wall of the nipple, extending to the areola. From the top of the nipple, the lines resemble a windmill; hence, the term “windmill flap” was used to describe this technique (Fig. 1).

The width of the crescent-shaped incisions depended on the planned reduction in the nipple diameter: usually

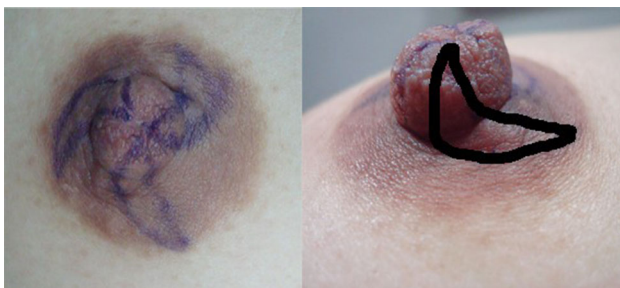


Fig. 1 Design of the windmill flap



Fig. 2 The nipple tissue was excised, according to the preoperative design. Point A was brought to point B using an intradermal, absorbable #5–0 Vicryl suture

more than 1/9 and less than 1/6 of the diameter of the nipple. If the shape of the nipple was oval or irregular, the curves of the design lines were adjusted. In some cases of nipple hypertrophy with ptosis, the upper crescent-shaped incision was wider than the two lower incisions, with a greater distance between the two lower crescent-shaped incisions.



Fig. 3 The incision was closed with a 6–0 common silk suture

Table 1 Patient survey responses

Questions	Items	Response, n (%)
Satisfaction with the aesthetic outcome of the surgery	Excellent	12 (75%)
	Good	4 (25%)
	Fair	0 (0%)
	Bad	0 (0%)
Appearance of the scar	Excellent	10 (62.5%)
	Good	5 (31.25%)
	Fair	1 (6.25%)
	Bad	0 (0%)
Breastfeeding	No breastfeeding after surgery	13 (81.25%)
	Not possible or very difficult	0 (0%)
	Minor problem	0 (0%)
	No problem	3 (18.75%)
Change in nipple sensation	Yes	1 (6.25%)
	No	15 (93.75%)
Other complications	Yes (name it in the blank)	0 (0%)
	No	16 (100%)

Patients were required to take this survey 6 months after surgery and 3 months after parturition (if pregnant post-operatively)

Excision and Sutures

A 2% lidocaine and epinephrine mixture was administered as local anaesthesia. The solution was injected through a tiny needle into the nipple and areola to control pain and bleeding.

The nipple tissues were excised separately, according to the preoperative design. Three intradermal, absorbable 5–0 Vicryl sutures were used to bring the remaining flaps

together and reduce both the diameter and height of the nipple (Fig. 2). The incision was closed with 6–0 common silk sutures at the end of the procedure (Fig. 3).

Postsurgical Procedure

A protective, doughnut-type dressing was applied to prevent unintended pressure or injury at the surgical site.

Fig. 4 The figure on the left (a–c) shows a preoperative view of nipple ptosis of a postlactational breast. The image on the right (d–f) shows post-operative views of the nipple, 1 year after surgery



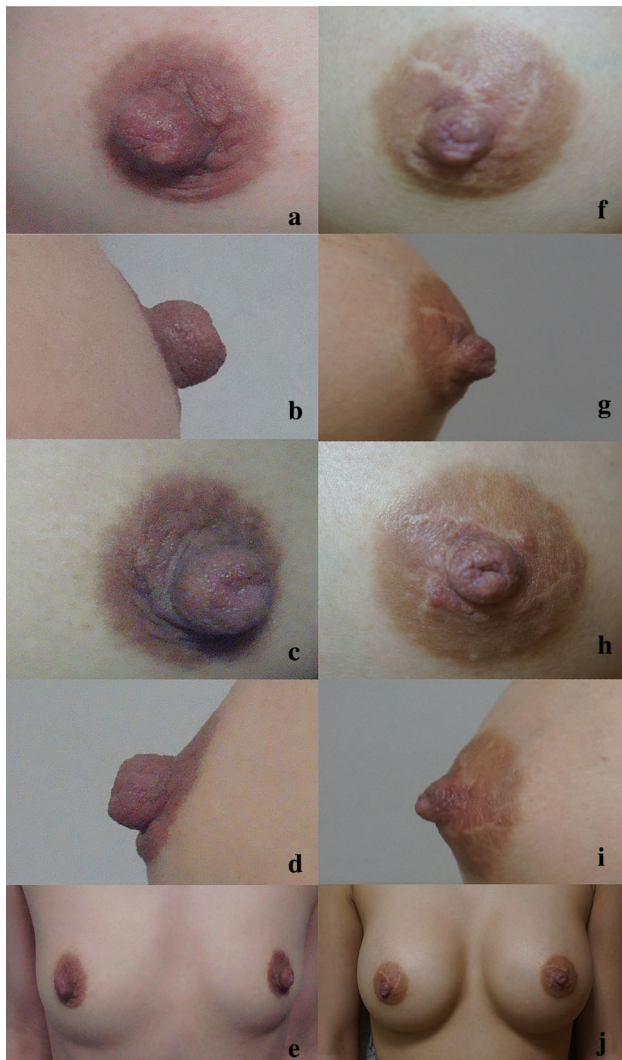


Fig. 5 The patient underwent nipple reduction with simultaneous breast augmentation under general anaesthesia, immediately after nipple reduction under local anaesthesia. **a–e** Preoperative views; **f–j** views 3 months after surgery

Results

Both nipples from each of 16 female patients, aged 24–41 years, were subjected to the new nipple reduction method in our department between May 17, 2010, and May 5, 2014. The follow-up period ranged from 0.5 to 4 years.

Before surgery, the mean diameter and height of the nipple were 15.9 ± 2.7 and 18.3 ± 3.1 mm, respectively, with the patient in the supine position. Immediately after surgery, the mean diameter and height of the nipple were 9.1 ± 1.7 and 7.9 ± 2.1 mm, respectively.

We surveyed the patients to evaluate the surgical outcomes. The aesthetic results and scars were categorized as bad, fair, good, or excellent. Nipple erectility was assessed by direct contact of the nipple with cold water-soaked

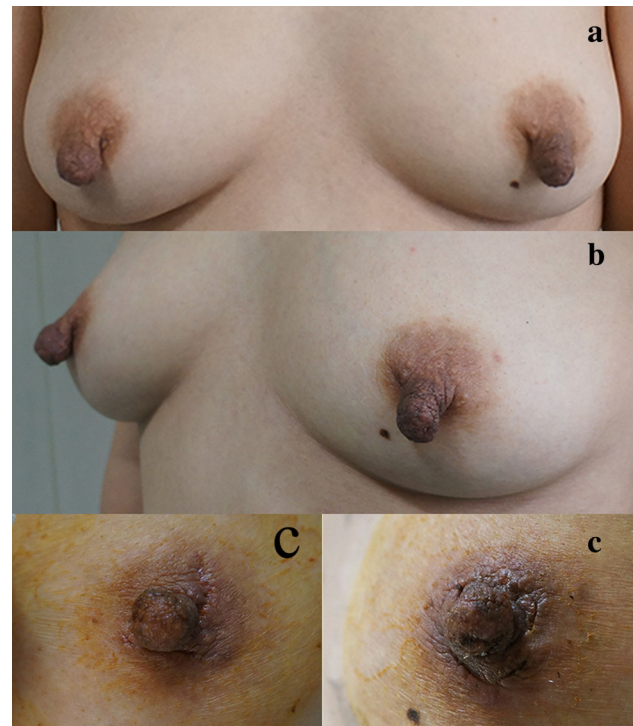


Fig. 6 The patient underwent nipple reduction under local anaesthesia. **a, b** Preoperative views; **c, d** views 10 days after surgery

gauze. Complications were also noted (Table 1). All patients were satisfied with the aesthetic results after surgery (Figs. 4, 5, 6). Only one patient complained about a change in nipple sensation. Three patients reported no difficulties with breastfeeding after surgery.

Six patients reported hypopigmented scars (Table 1). No major complications, such as nipple necrosis, infection, delayed wound healing, or loss of sensation, were noted.

Discussion

Nipples play an important role in a woman's sexual pleasure and ability to perform lactation. However, large nipples may make a woman feel embarrassed, because of their prominence, which elicits negative emotions in such women. This condition tends to occur in females within the same family, appearing after the onset of adolescence or following pregnancy, and persisting until menopause [3, 6].

Several nipple reduction methods have been published in the past few decades. Generally, these methods are categorized into two types: one destroys the lactiferous duct, and the other does not. The triple-flap technique, nipple graft method, and sinusoidal nipple reduction all result in disruption of the duct [5, 10, 13]. Both the

modified top hat flap technique and nipple circumcision reshape the nipple but preserve its function [2–4].

However, these methods all have shortcomings. Preserving lactation is a big concern for some surgical techniques. Other methods restrict the design or modification of the nipple size during the surgery. Still other procedures compromise vascular flow and lymphatic drainage, leading to nipple necrosis.

A windmill flap can be performed on all types of nipples and is easy to modify to meet different patient preferences. This technique prevents disruption of the lactiferous ducts. The procedure preserves almost the complete subdermal arterial plexus, preventing any disruption of the nipple's circulation. In addition, nipple hypertrophy always occurs in cases with big areolas. No published method has been reported to reduce both the diameter and height of the nipple, as well as the diameter of the areola, except for the windmill flap technique. This method can reduce the height of the nipple by suturing flaps together spirally so that the nipple is rotated and some skin of the nipple is moved to the areola (Fig. 2). It can also correct nipple ptosis by adjusting the curve of the incision.

Like all other surgical techniques, the windmill flap has its shortcomings. It cannot reduce the diameter and height of the nipple very accurately. However, a well-trained plastic surgeon can predict the surgical outcome and excise an appropriate amount of tissue. As seen with other methods, the windmill flap will result in scarring of both the nipple and areola.

Conclusions

The windmill flap nipple reduction technique can reduce both the height and diameter of the nipple with negligible complications. As nipple function and aesthetic outcomes were good, all patients were satisfied with their new nipples.

Compliance with Ethical Standards

Conflict of interest All authors declare that they have no conflict of interest. No commercial associations or financial disclosures are contained.

Human and animal rights statement All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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