

A New Surgical Procedure for the Very Severe Inverted Nipple

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Abstract. Severe cases of inverted nipple usually cannot be corrected by a simple procedure, especially if the nipple cannot be pulled out above the areolar level by manipulation. We describe a new method for these cases and we classify the inverted nipple into 3 grades following the choice of their required operative procedure. Our classification for inverted nipple is as follows. Grade I: The inversion is corrected simply by manipulation; the nipple protrusion is long-lasting. Grade II: The inversion can be corrected by manipulation, but recurrence of the inversion is frequent. Grade III: The inversion cannot be corrected without a surgical procedure. Cases of Grades I and II can be corrected by conventional simple surgical procedures. But some cases of Grade II and almost all of Grade III cannot be corrected by conventional methods, in spite of the high frequency of relapse. Cutting of the lactiferous duct, such as the Pitanguy and Broadbent methods, can correct the very severely inverted nipple. But if we want to maintain the lactiferous function after correction, we had better not cut the lactiferous ducts. Our new procedure for correcting very severe cases can keep the lactiferous function after correction without any relapse. In order to avoid the recurrence of nipple retraction and to maintain the lactiferous function, the new surgical procedure that we performed makes an incision deeply and vertically on the nipple to free the lactiferous ducts from the contracted tissues surrounding them. After extension or resection of the restricting tissues, the nipple is raised easily. This procedure will preserve the feeding function and prevent the recurrence of nipple inversion. For very severe cases, using a dermal flap inserted into the base of the nipple may be necessary due to its role of interposing tissue to prevent reverting to inversion.

Key words: Nipple—Inverted nipple—Nipple plasty—Lactiferous function—Dermal flap

A nipple lying below the plane of the areola is designated as an inverted nipple. Many inverted nipples were considered to be congenital and resulted from disturbances of fetal development.

The nipple is physiologically retracted until its elevation begins in adolescence. Thus only those nipples remaining retracted after adolescence are called “inverted nipples.”

Our Classification of the Inverted Nipple

We classified the inverted nipples into three grades for the choice of the surgical procedure.

- Grade I: The inversion is corrected simply by manipulation; the nipple protrusion is long-lasting.
- Grade II: The inversion can be corrected by manipulation, but recurrence of the inversion is frequent.
- Grade III: The inversion cannot be corrected without a surgical procedure.

Materials

We had treated 255 inverted nipples in 148 cases. Most were Grade II or III. Twenty-three nipples were Grade I. When a patient wanted to correct a Grade I inverted nipple earnestly for a cosmetic reason, conventional operations such as the Sellheim method, Skoog method, and Nannba's z-plasty method were usually selected by us. And of these, 88 nipples were Grade II and 144 nipples were Grade III.

Operation

Grade I and II cases were corrected by conventional simple surgical procedure. Some of the Grade II and

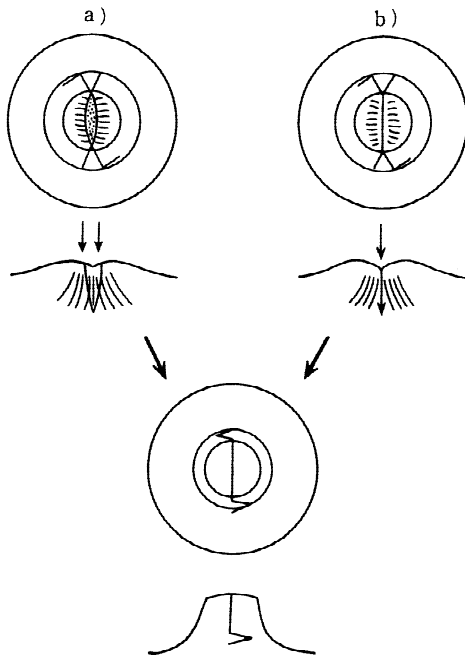


Fig. 1. The surgical technique used to correct severe inverted nipple (method I). (a) Without preservation of breast-feeding function. Contracted tissues are excised and Z-plasties are constructed on the neck of the nipple. (b) With preservation of breast-feeding function. The contracted tissues are released and the incision is deepened through them, then Z-plasties are constructed on the neck of the nipple.

most of the Grade III cases were not corrected by the conventional method, because of their high frequency of relapse. If we cut the lactiferous duct such as by the Pitanguy or Broadbent method, we could correct even the very severe inverted nipple. But we wanted to maintain lactiferous function well after the correction, therefore we did not want to cut the lactiferous duct. That is why we used the new method to correct the very severe cases; meanwhile, we could maintain the lactiferous function well, without relapse after correction.

Method I (Fig. 1). An incision is made in the middle of the nipple along the lactiferous ducts, deeply and vertically. If the depression of the nipple is deep, dissection can be difficult, therefore the incision is extended along the circumference of the depressed part in advance, then extended downward at the center of the nipple. If breast-feeding is no longer desired, the nipple is raised after the resection of some restricting tissue around the lactiferous ducts (method Ia). If breast-feeding, is still planned in younger patients, the incision should be done carefully and proceed parallel to the lactiferous ducts. To preserve the ducts, a scalpel should be used only to make the skin incision; for the incision to the deeper layer, blunt dissection using a scissors is recommended.

Once the contracted fibrotic tissue is separated from the lactiferous ducts, the ducts will be extended until the nipple is free and able to rise (method Ib). Separation and extension should be performed completely even if a few

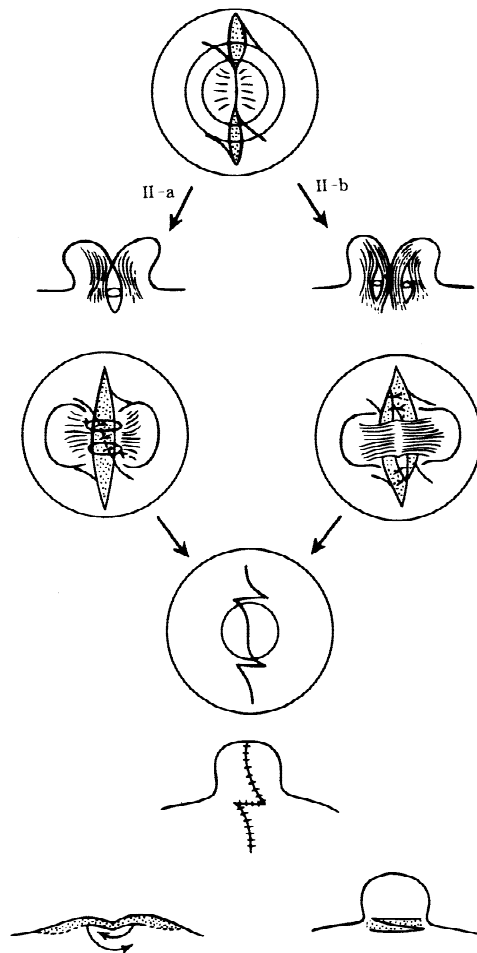


Fig. 2. Surgical technique for correction of very severe inverted nipple (method II). This technique is used to preserve breast-feeding function despite a very severe inverted nipple. The pictures at the bottom are lateral views from another side.

lactiferous ducts may be torn during the procedure, because the preservation of restricted ducts might prevent the normal functioning of the nipple. Then protrusion of the nipple will be maintained by adding an inner suture; a couple of stitches placed on the base of the nipple will not damage the lactiferous ducts. Since the narrowed base of the nipple is still loose at this stage, a Z-plasty is added on the areola at the end of the incision, just like a triangular flap, and then it is raised and rotated laterally along the base of the nipple to secure the protrusion firmly and to prevent the recurrence of retraction. Separation of the contracted tissues from the lactiferous ducts and the Z-plasty on the base of the nipple are important procedures in this method.

The sutures should be done only on the top of the protruded nipple and the base of the nipple; the raw surface remains on both sides of the protruded nipple without suture. The raw surface will be covered by the pigmented nipple skin within 2 or 3 weeks after conservative treatment with ointment.

Correction performed by method I may fail occasion-

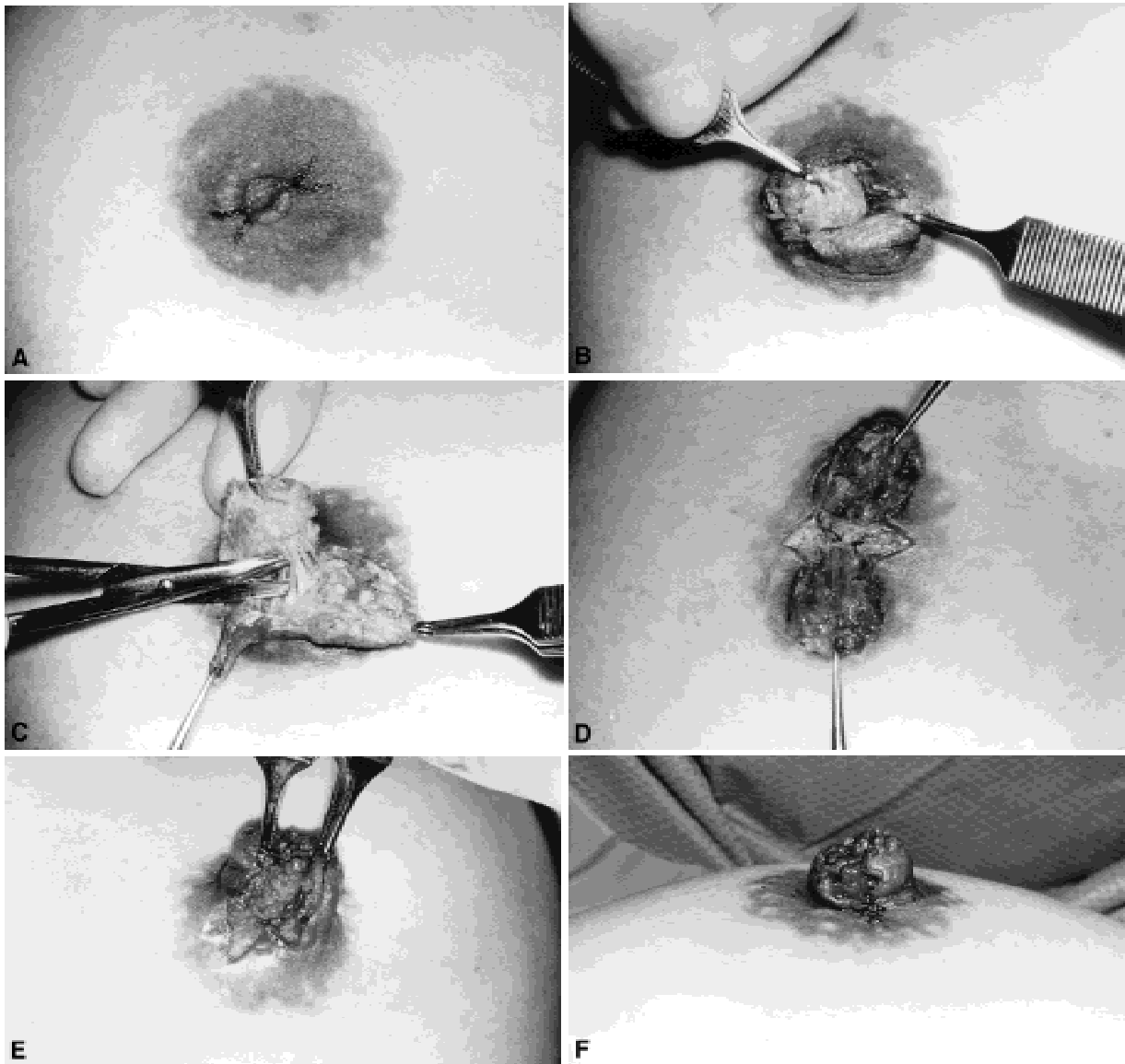


Fig. (3A). Correction of a very severe Grade III inverted nipple by method II in a 28-year-old pregnant woman. A very severe inverted nipple, preoperative view. Marking of the incisions for correction by method I. **Fig. (3B).** The incision is deepened vertically into the nipple. **Fig. (3C).** Contracted fibrotic tissues are separated from the lactiferous ducts with a scissors to loosen tissues by blunt dissection. **Fig. (3D).** The nipple has been raised after releasing and extension of the lactiferous ducts, and two dermal flaps are sutured in the center like a suspension bridge. **Fig. (3E).** Three stitches of an inner suture at the base of the nipple are placed carefully to avoid injury of the lactiferous ducts just above the dermal flap bridge that suspends the nipple. After this, Z-plasties at the base of the nipple are performed. **Fig. (3F).** View of the completion of the surgical correction after Z-plasties have been formed. Two raw surfaces still remain on the lateral side of the protruded nipple.

ally, leading to subsidence of the nipple again. For example, efforts concentrated only on saving the lactiferous ducts may cause failure of the corrective procedure in some cases right after the pulling is released during the operation. If most of the lactiferous ducts are cut, the recurrence of retraction can be prevented by this method. However, if the lactiferous ducts need to be saved for future breast-feeding, despite the presence of an extremely deep depression, treatment by method I is not appropriate. Therefore, method II should be used (Fig. 2). In method II, the nipple can be raised as described

above and fixed with dermal flaps that play a role of suspension, like a bridge at the base of the nipple (Fig. 3).

In the same way as described for method I, an incision is made deeply and vertically into the nipple (Fig. 3b), and the contracted tissues are separated from the lactiferous ducts (Fig. 3c). Incisions are added for Z-plasties on the root of the nipple to the areola to obtain longer triangular dermal flaps, then the epidermis is shaved, and the two dermal flaps face each other.

These dermal flaps are then pulled up together and

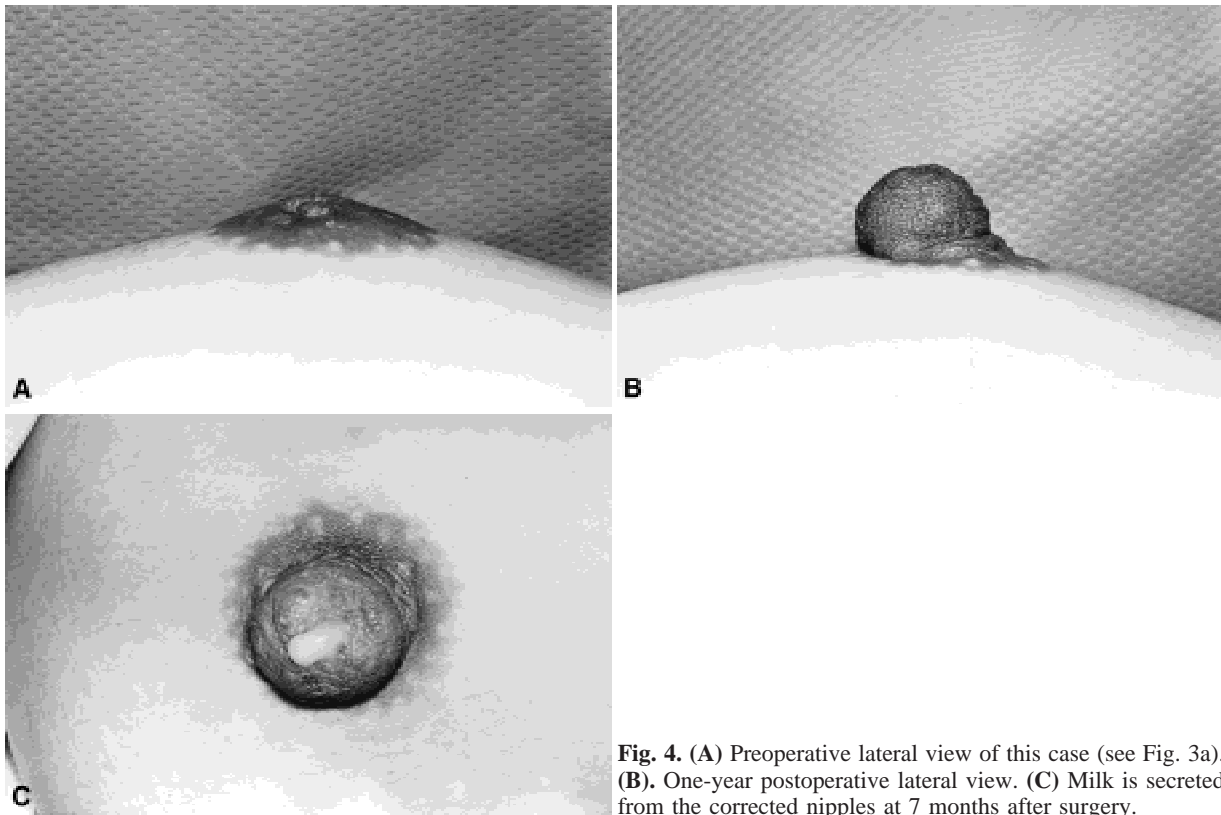


Fig. 4. (A) Preoperative lateral view of this case (see Fig. 3a). (B). One-year postoperative lateral view. (C) Milk is secreted from the corrected nipples at 7 months after surgery.

sutured (Fig. 3d). After the suture, the nipple is mounted on the dermal flaps, which is form II-a, a suspension bridge attached to the base, or is suspended by the dermal flaps after they are transposed through a tunnel formed across the nipple without damaging the lactiferous ducts, form II-b.

Results

We have performed method I for 2 nipples of Grade I cases and 59 nipples of grade II cases. The result was good for each nipple. And we have performed it for 111 nipples of grade II cases. The results were excellent in 102 nipples; nevertheless, 4 nipples were partially necrotic on the raised nipples, but eventually all cases recovered and obtained good shapes. Only five nipples were recurrent, and we had to perform method II in these cases. After using method II, the results were all good.

We applied method II to 6 nipples of Grade II and 32 nipples of Grade III, of which 35 nipples got a good result. Unfortunately, in three nipples the technique failed. We then had to perform method II again, and eventually good results were obtained in these cases.

Discussion

There are various surgical approaches for treating inverted nipples, and the procedures have a number of

operative stages in common. Usually, the tissue around the nipple is cut downward. Finally, the nipple is tied tightly around its neck to maintain the elevation, but the important point is how to maintain sufficient circulation of the nipple. To keep the nipple elevated, the skin at the root of the nipple is usually resected triangularly for use in tightening the root of the nipple and shortening the circumference of the root of the nipple in some methods [6,7]. Nannba and Itoh [4] utilized the technique of Z-plasty to shorten the circumference of the root of the nipple. Nevertheless, some tendency for recurrence is recognized in severe cases of inverted nipple, just because shortening of the tissue around the lactiferous duct still exists, and it is hard to pull up the severe inverted nipple to the areolar level. Postoperatively, in these methods the elevated nipple should be placed under tension with strings to maintain its protrusion. Sometimes we use a folded gauze or a sponge, placed around the nipple, as a splint; an alternative splint is a cup with a hole open in the bottom. But our methods do not require any external fixation or suspension. And the recurrence rate is low. In our series we experienced 5 recurrences of 172 nipple corrections by method I and 3 recurrences of 38 nipple corrections by method II.

If the lactiferous duct is cut as in the Pitanguy [5] and Broadbent [1] techniques for the purpose of elevating the retracted nipple, it is easy to obtain a good correction even for severe cases, but breast-feeding function has to be abandoned.

To maintain the elevation of the nipple, Elsahy [2] used two triangular deepithelialized hinge flaps from the areola for a hammock-like sling passing the tunnel of the elevated nipple. Haeseker [3] used three deepithelialized turnover flaps. Our two deepithelialized flaps with method II are a little bit different from Elsahy and Haeseker's flaps, because our deepithelialized flap originates mainly from the inverted nipple side.

Controversy still exists about whether the breast can maintain its function after the nipple is raised by any of our methods. In the 24 nipples of 12 patients, mothers could feed their babies postoperatively after delivery, and the secretion of milk was also confirmed (Fig. 4c).

Conclusions

We have classified inverted nipples into three grades for surgical correction. For the correction of severe inverted cases such as some Grades II and III, we use method I. And for failed cases by method I, as well as very severe

cases of Grade III, we perform method II, and good results have been obtained. We can confirm postoperative secretion of milk in many cases.

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