

Mastectomy in Female-to-male Transsexuals

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The first operative procedure in sex reassignment surgery (SRS) for female-to-male transsexuals (FTMTS) is mastectomy. This procedure includes the removal of mammary tissue, removal of excess skin, and reduction and proper repositioning of the nipple and areola complex. We have performed mastectomies in over 120 patients since January 2001 and want to describe the operative procedures we have developed. We classified our patients into 3 groups according to the patient's breast volume and the degree of ptosis, and we selected the operative procedure that was suitable for each group. At present all costs for SRS are assumed by the patient in Japan. If the FTMTS patient undergoes the entire series of SRS operations, he has to pay more than 3,000,000 yen. Thus the surgeon should select the proper operative procedure so that the patient can avoid unnecessary additional operations. We describe herein the techniques and the strategy for performing mastectomy in FTMTS.

Key words: mastectomy, female-to-male transsexual, sex reassignment surgery

To date, various operative procedures for mastectomy in FTMTS have been reported, including the semicircular, trans-areolar, concentric circular, and extended concentric circular approach and the free nipple-areolar complex graft [1-5]. Almost all of these procedures are modifications of the treatments for gynecomastia [6, 7]. We usually adopt the inferior semicircular-areolar approach for mastectomy in FTMTS. This procedure is very useful for those whose breasts are not so ptotic with a moderate volume, because it does not leave such a noticeable scar and the nipple reduction can be done simultaneously. One or more additional operations might be necessary, however, for redundant skin excision in moderate or severe mast ptotic cases when using this procedure. We therefore introduced a new breast abscission

procedure which transfers the nipple-areolar complex tissue with a deep dermal portion and an adiposal tissue pedicle for severe mast ptotic cases. The nipple-areolar complex tissue can be transferred very safely with this procedure compared with a free nipple-areolar graft.

Patients and Methods

According to our surgical protocol, we performed mastectomies in a total of 123 FTMTS patients between January 2001 and November 2008. All patients were operated on under general anesthesia. The operative procedure was selected according to the breast volume and the degree of ptosis. We classified our patients into 3 groups (Table 1). In those cases where the breast volume was moderate and the lower margin of the areola did not cross the infra-mammary fold (group 1), we adopted the inferior semicircular-areolar approach (Fig. 1A). In those cases where the

Table 1 Patients classification

	group 1	group 2	group 3
No. of patients	110	3	10
mean age	26	31	29
mean operative time (h)	2.2	3.2	3.5

breast volume was large but the upper margin of the areola did not cross the infra-mammary fold (group 2), we adopted the concentric circular approach (Fig. 1B). In those cases where the upper margin of the areola crossed the infra-mammary fold regardless of the breast volume (group 3), we adopted the nipple-areolar complex transfer procedure (Fig. 1C). A total of 110 patients (group 1) underwent subcutaneous mastectomies via the inferior semicircular-areolar approach, 3 patients (group 2) were treated via the concentric circular approach, and 10 patients (group 3) were treated via the nipple-areolar complex transfer procedure. The patients wore a chest-band for 3 weeks, and physically demanding sports such as volleyball were prohibited for 3 months. If a second revision was needed, it was done 3 months after the first operation.

Representative Cases

Case 1, 22-year-old FTMTS. The patient was classified into group 1 (Fig. 2A), so we adopted the inferior semicircular-areolar approach. After subcutaneous mastectomy we performed liposuction with a liposuction device (Fig. 2B) and refreshed the

wound wedge. A suction drain was placed in the mammary cavity. A small amount of the mammary tissue connected with the nipple-areolar complex was fixed on the pectoralis major muscle fascia at the original site. Nipple reduction was performed with a dermal punch knife, which is usually used for dermal biopsies (Fig. 2C, D). The operation wound was closed. This patient did not need re-operation or additional revision (Fig. 2E).

Case 2, 26-year-old FTMTS. The patient was classified into group 2, so we adopted the concentric circular approach (Fig. 3A). Medial and lateral transversal skin incisions were connected with the inferior semicircular areolar skin incision. After the subcutaneous mastectomy (Fig. 3B), 2 concentric circles were designed from the incision. The smaller one was designed on the areola with a diameter of almost 3 cm, and the bigger one was designed with a diameter regulated by the excess of the mammary skin (Fig. 3C). The upper half of the encircled area with 2 circles was de-epithelialized to keep blood circulation to the nipple-areolar complex, and the lower-half skin was excised (Fig. 3D). A suction drain was placed in the mammary cavity. The outer circle was then sutured to the inner one, and the excess skin was excised as medial and lateral triangles (Fig. 3E). The operative wound was closed, and the transversal line still crossed over the areola (Fig. 3F).

Case 3, 29-year-old FTMTS. The patient was classified into group 3, so we adopted the nipple-areolar complex transfer procedure (Fig. 4A). A 3-cm diameter circle was designed on the areola, and

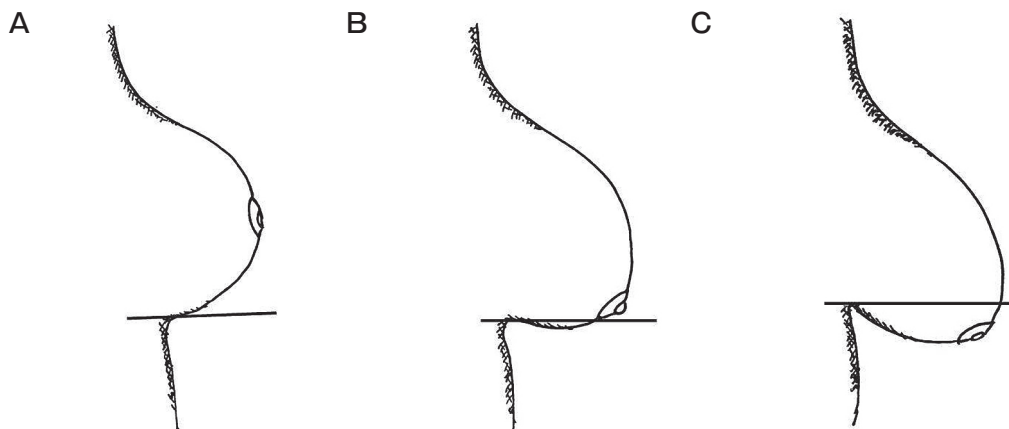


Fig. 1 A, Schema of group 1; B, Schema of group 2; C, Schema of group 3.

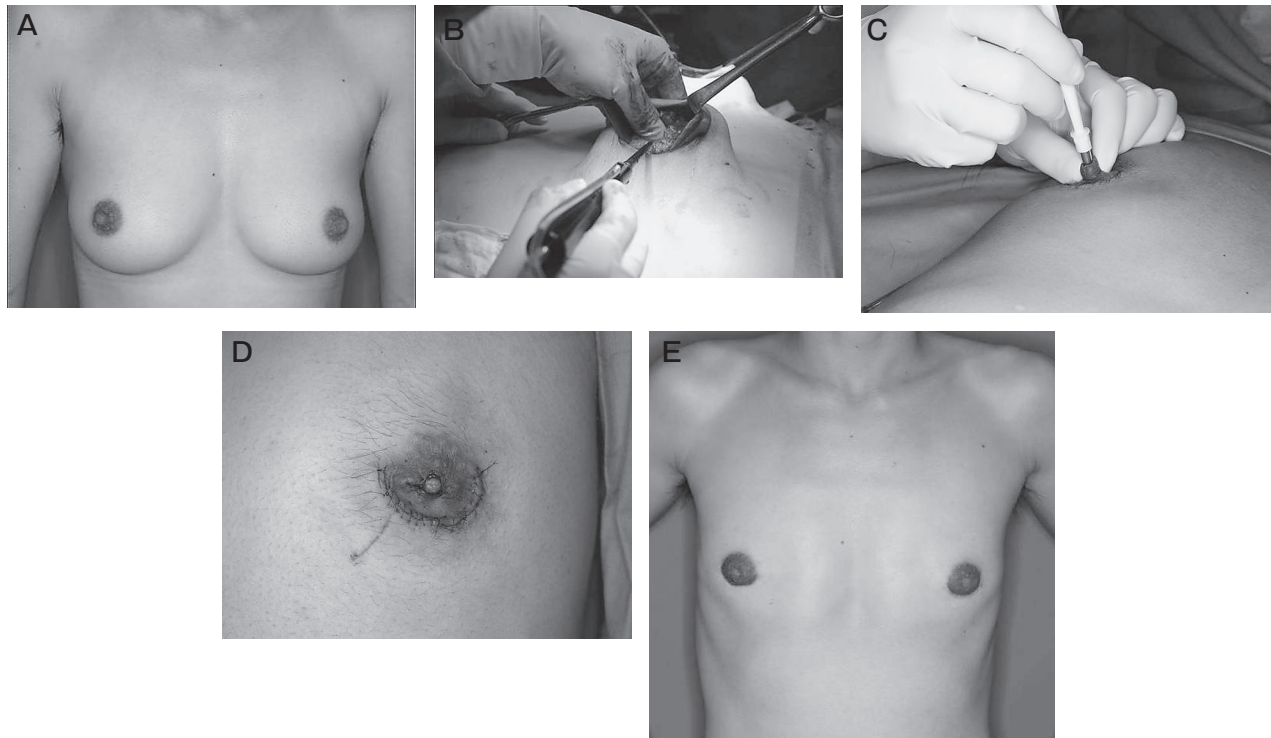


Fig. 2 A, Case 1 before the operation; B, Liposuction; C, Nipple reduction with a dermal punch knife; D, The nipple after reduction; E, One year after the operation.

the infra-mammary fold was traced with a skin marker. A triangular flap was designed that was surrounded by the central one-third of the infra-mammary fold line and the straight lines that linked with the 3-cm diameter circle and both ends of the central one-third of the infra-mammary fold line. First, the triangular flap was de-epithelialized. The 3-cm-diameter circle and the medial and lateral one-third of the infra-mammary fold line were incised. A small amount of the mammary tissue was kept, so it could be connected with the nipple-areolar complex, and the flap was elevated (Fig. 4B). The subcutaneous mastectomy from the incision was performed. The mammary flap was then pulled down, and the excess skin was marked. The excess skin was excised, and the rest of the mammary flap was temporarily sutured with along the infra-mammary line. The ideal new position of the nipple-areolar complex was marked and excised circularly on the mid-clavicular line and on the fifth rib (Fig. 4C), which is the usual location for this excision. A suction drain was placed in the mammary cavity. The nipple-areolar complex was transferred subcutaneously and exposed at the new position (Fig. 4D). The operative

wounds were closed. This patient did not need re-operation or additional revision (Fig. 4E).

Results

Major complications such as flap necrosis and severe infection were not recognized in any of our patients. Hematoma was recognized in 6 patients. All of them were in group 1 and were operated via the inferior semicircular-areolar approach. They were re-operated under local anesthesia. The bleeding points were the perforator of the inter-mammary artery in 2 cases, the perforator of the lateral thoracic artery in 2 cases, and the pectoralis major muscle in 2 cases. Partial necrosis of the nipple-areolar complex was recognized in 4 patients, and all of them healed spontaneously.

Discussion

We introduced 3 operative procedures, the inferior semi-circular approach, the concentric circular approach, and the nipple-areolar complex transfer.

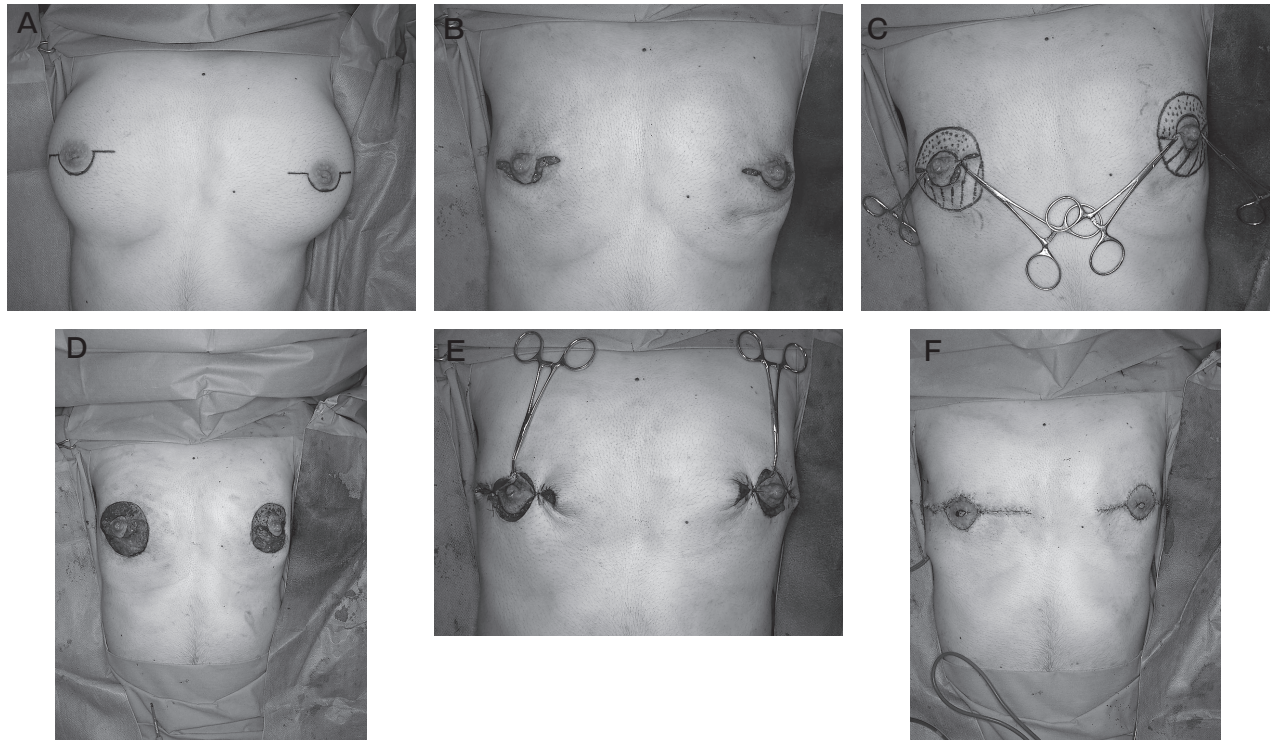


Fig. 3 A, Case 2 before the operation; B, After the subcutaneous mastectomy; C, Designed concentric circles; the dotted area was to be de-epithelialized, and the slant lined area was to be excised; D, After de-epithelialization and excision; E, Suturing the concentric circles and excision of the excess skin; F, Immediately after the operation.

The selection of the operative procedure depended on the breast volume and the degree of ptosis. There are several points that the surgeon should pay attention to during any mastectomy operation. A small amount of mammary tissue should be retained to be connected with the nipple-areolar complex. If the surgeon completely removes mammary tissue under the nipple-areolar complex, a depression deformity will appear. The surgeon should preserve the pectoralis major muscle fascia intact, or fixation of the nipple-areolar complex may be difficult. We usually fix it with the fascia. If the surgeon finds bleeding from a perforator of the inter-mammary artery or the lateral thoracic artery, hemostasis should never be performed with electric coagulation but always by suture ligation. Postoperative hematoma will be caused by re-bleeding from the perforator.

The best result can be obtained with the inferior semicircular-areolar approach, because it leaves minimal scarring. When the patient is operated via the trans-areolar approach, nipple reduction cannot be performed simultaneously, because the blood flow to

the nipple-areolar complex may be uncertain [8], and the transversal scar crossing through the areola is easily noticeable, so we do not adopt this approach. In cases with over-redundant breast skin, procedures are needed for skin excision. In the case of the concentric circular approach, the circular operative wound is usually closed by the "round block" purse string suture method [9-10]. If there is too much difference between the outer circle and the inner one, a radical rhytid will develop surrounding the areola. We excise the medial and lateral triangle skin to correct this radical rhytid. The patient can select an operative scar, a radical rhytid, or a transversal line crossing over the areola. In cases with severe mast ptosis and where the upper margin of the areola crosses the infra-mammary fold, the excess skin cannot be dealt with via the concentric circular approach. Conventionally, a free nipple-areolar complex graft procedure is adopted in these cases, but necrosis and de-pigmentation of the nipple-areolar complex may be seen quite often, so we introduced our new technique whereby the nipple-areolar complex can be moved very

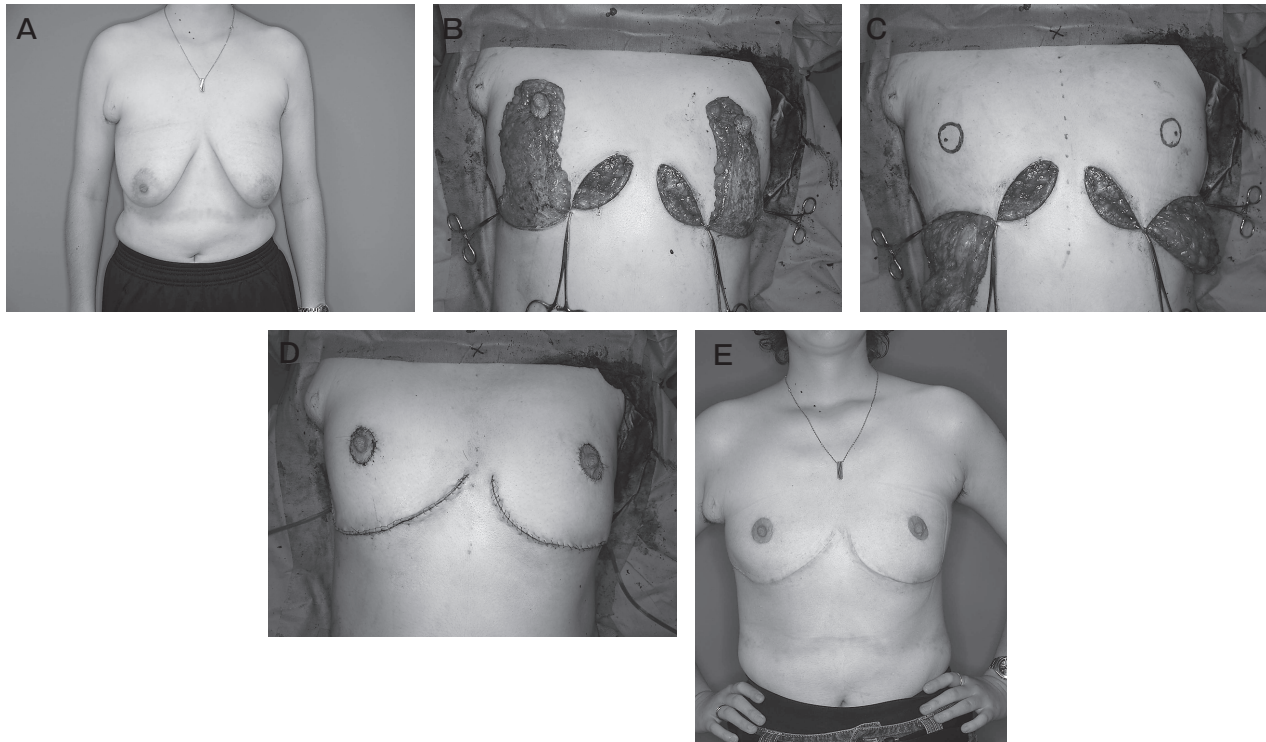


Fig. 4 A, Case 3 before the operation; B, Elevation of the nipple-areolar flap; C, The new nipple-areola complex position; D, Immediately after the operation; E, One year after the operation.

safely. The nipple-areolar complex transfer with a de-epithelialized flap allows continued blood flow to the nipple-areolar complex. No necrosis or de-pigmentation of the nipple-areolar complex occurred in any of the 10 patients who underwent this procedure.

Conclusion. The first operative procedure of sex reassignment surgery (SRS) in female-to-male transsexuals (FTMTS) is mastectomy. We introduced three operative procedures. The selection of operative procedure depended on the patient's breast volume and the degree of ptosis. The best result can be obtained with the inferior semicircular-areolar approach, because postoperative scarring is minimal.

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