Vertical mammoplasty: Postoperative changes, complications and patient evaluation

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The aim of the present study was to investigate postoperative changes after vertical mammoplasty. Between 2002 and 2005, 72 consecutive patients aged 15 to 69 years with an average weight of 72 kg underwent bilateral vertical mammoplasty. Forty-two patients attended the regular follow-up one week, four weeks, three months, six months and one year after the operation. Nipple diameter, notch-to-nipple distance, scar length and the number of skin folds along the vertical scar were evaluated. Complications were recorded during the entire follow-up period. A questionnaire was used to document patient satisfaction 12 months after the operation. The main changes took place during the first three months after surgery. Nipple diameter showed an average increase of 28% after surgery, and the notch-to-nipple distance increased by an average of 17% over the intraoperative value. The average increase of the scar length after one year was 22%. The rate of complications was low, and patient satisfaction was high.

Key Words: *Complications; Notch-to-nipple distance; Patient satisfaction; Vertical mammoplasty*

Vertical mammoplasty is a technique with a lot of advantages. In addition to a limited amount of scarring, this method produces better and more stable results than other methods (1-3). One of the few disadvantages is that the learning curve of this procedure is long relative to other methods. Because the intraoperative shape of the reduced breast differs significantly from the breast after a period of three months, this makes it difficult for the surgeon to estimate the final shape of the new breast while operating. The aim of the present study was to quantify the postoperative changes of the breast after vertical reduction, thereby simplifying the preoperative planning.

PATIENTS AND METHODS

The present study was a nonrandomized, prospective study. Between 2002 and 2005, 72 consecutive patients aged 15 to 69 years underwent bilateral vertical mammoplasty. Forty-two patients attended the regular follow-up one week, four weeks, three months, six months and one year after the operation. For each patient, data on age, weight, height and body mass index were collected. Photos were taken at each appointment. Nipple diameter, notch-to-nipple distance, scar length and the amount of skin folds along the vertical scar were evaluated intraoperatively and postoperatively at each follow-up visit. Complications were recorded during the follow-up period. A questionnaire was used to document the patient's satisfaction one year after the operation.

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Mammoplastie verticale : Anomalies, complications et satisfaction des patientes après l'intervention

Le but de la présente étude était d'analyser les anomalies postopératoires après des interventions pour mammoplastie verticale. Entre 2002 et 2005, 72 patientes consécutives âgées de 15 à 69 ans et pesant en moyenne 72 kg ont subi une mammoplastie verticale bilatérale. Quarante-deux patientes se sont présentées à leurs visites de suivi régulières, une semaine, quatre semaines, trois mois, six mois, puis un an après leur intervention. Le diamètre des mamelons, la distance pli-mamelon, la longueur de la cicatrice et le nombre de replis cutanés le long de la cicatrice verticale ont été mesurés. Le cas échéant, les complications ont été notées pendant l'entière période de suivi. Un questionnaire a été utilisé pour documenter le degré de satisfaction des patientes 12 mois après leur intervention. Les principales anomalies sont survenues au cours des trois premiers mois suivant l'intervention. Le diamètre des mamelons a augmenté en moyenne de 28 % après la chirurgie et la distance pli-mamelon a augmenté en moyenne de 17 % par rapport à la distance mesurée durant l'intervention. L'allongement moyen de la cicatrice après un an a été de 22 %. Le taux de complications a été faible et le degré de satisfaction des patientes a été élevé.

TABLE 1
Age, weight, height and body mass index (BMI) of the patients in the study (mean $\pm$ SD)

	Age	Weight	Height	BMI
Patients	40 $\pm$ 14 years	72 $\pm$ 11 kg	166 $\pm$ 0.06 cm	26 $\pm$ 4 kg/m ²

The average notch-to-nipple-distance was 30 cm. The average reduction weight per breast was 584 g (minimum 55 g, maximum 1371 g). Liposuction was performed in 29 breasts. The mean volume of tissue removed by liposuction was 200 mL. The mean age, weight, height and body mass index of the patients are shown in Table 1.

RESULTS

Notch-to-nipple distance

The main increase in the notch-to-nipple distance was found during the first four weeks after surgery (Figure 1). After three months, the notch-to-nipple distance was almost stable. In total, there was an average increase of 17% over the intraoperative notch-to-nipple distance.

Scar length

Scar length increased mainly during the first week (Figure 2). During the follow-up period, there was still a slight increase in scar length. The average increase after one year was 22%.

Figure 1) Notch-to-nipple distance, postoperative changes

Figure 3) Nipple diameter, postoperative enlargement

Figure 2) Scar length, postoperative changes

Figure 4) Skin folds along the vertical scar, postoperative changes

Nipple diameter

Nipple diameter showed its main increase during the first four weeks, although there was still an increase between six months and one year (Figure 3). The average nipple diameter was increased by 28% after one year.

Skin folds

The average number of skin folds immediately after surgery was three (Figure 4). After one year, the average number of skin folds went down to zero. Rarely, a skin fold remained and could be removed electively by surgery.

Wound healing

Wound healing problems along the vertical scar occurred in 11 patients, although secondary healing with complete wound closure was achieved after an average period of two weeks (Table 2). Infection occurred in only three patients. These patients were treated with antibiotics, Rivanol dressing and antiseptic rinses of the wound. This treatment was efficient and no deformation resulted. There was one patient with a postoperative hematoma in whom surgical revision

TABLE 2
Rate of complications

	Wound healing problems	Infection	Hematoma	Reaction to Panacryl*	Hypertrophy scarring
Patients (n)	11	3	1	1	1

*Ethicon Inc, USA

was necessary. One patient showed a reaction to Panacryl sutures (Ethicon Inc, USA), which were used for the subcutaneous stitching. Another patient developed hypertrophic scarring. There were no cases of areola necrosis.

Patient satisfaction

The patients' evaluations showed that 95% were satisfied to very satisfied. Ninety per cent of the patients expressed that the operation gave them a positive change in life. In 90% of the patients, symptoms such as back pain, headaches and intertrigo were relieved or even disappeared completely after breast reduction. Seventy-nine per cent experienced a gain in self-confidence.

Figure 5 A 21-year-old woman before surgery (A), intraoperatively (B), four weeks after (C) and six months after (D) vertical mammoplasty. Reduction weight: 458 g (right side) and 366 g (left side)

DISCUSSION

There are significant changes in breast shape during the first postoperative year after vertical mammoplasty (Figures 5 and 6). The shape of the breast immediately after surgery appears very different from the final form of the breast. It is important for both the surgeon and the patient to know that there will be significant changes during the postoperative phase. For the patient, it can be quite shocking to see her new breasts after surgery. Therefore, it is important to prepare the patient and explain how the reduced breasts will change during the postoperative phase. The majority of changes take place during the first three months after surgery. After this time, the breast has a shape similar to its final appearance. However, minor changes will continue over the one-year postoperative period. Our investigations have shown that there are almost no changes during the second year after surgery.

It is very important for the surgeon to be able to predict the extent of changes to be able to effectively plan the operation. For example, knowing in advance that the nipple diameter will show an average increase of 28% prevents an inferior aesthetic result with a nipple that is much too large. In addition, knowing that the notch-to-nipple distance will increase by 17% after surgery allows the surgeon to calculate a shorter distance while planning the operation. For example, with the patient in the standing position, we usually take a notch-to-nipple distance of 22 cm to 24 cm. After the operation is finished, the average notch-to-nipple distance is usually 18 cm to 20 cm. Preoperatively, depending on the size of the breast, gravity pulls the breast down, putting tension on the skin and thereby increasing the distance. Postoperatively, there is less tension on the skin, so the notch-to-nipple distance becomes smaller.

The vertical mammoplasty method has a low rate of complications. Wound healing seems to be the main problem after mammoplasty, but major deformity is rarely encountered. Complications that demand a second operation are very rare. In contrast to Lejour (3) and Cunningham et al (4), we did not find a relation between the rate of healing complications and the size and fat content of the breasts in our patients.

Figure 6 A patient preoperatively (A), intraoperatively (B) and post-operatively at one week (C), four weeks (D), six months (E) and one year (F) following vertical mammoplasty. Reduction weight: 308 g (right side) and 280 g (left side)

Patient satisfaction after vertical mammoplasty is usually very high. There is often a great benefit for the patient, both physically and psychologically. Still, as Godwin et al (5) describe, once the preoperative upper torso symptoms of neck and back pain, strap furrows and submammary intertrigo have resolved, the cosmetic aspects such as scars become the main cause of patient dissatisfaction. In our study, patient satisfaction was evaluated one year after surgery. The results showed a high satisfaction rate in our patients, which indicates that vertical mammoplasty is a sufficient method of breast reduction, both technically and from an aesthetic point of view.

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