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Early experience with Lejour vertical scar reduction mammaplasty technique

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Abstract. The study contains 163 patients who underwent a reduction mammaplasty at the Karolinska Hospital during 1991–1992. Seventy patients were operated on using the Lejour short scar technique (superovertical pedicle) and 93 using the Strömbeck method (medial pedicle). The aim of this study was to compare the results of these two different methods with regard to scar formation, position and sensation in the nipple areola complex, postoperative complications, healing conditions, shape and volume symmetry of the breasts and patient satisfaction. An objective method [20] was used for assessment of postoperative breast asymmetry. Advantages and disadvantages of both methods are presented. The incidence of early complications was low in both groups, compared with the data presented in the literature, but Strömbeck's method was found to be superior in some respects because of fewer early postoperative complications, shorter healing period and better breast symmetry postoperatively.

Key words: Breast hyperplasia – Reduction mammaplasty – Lejour-Strömbeck – Postoperative results

Modern techniques of breast reduction focus on minimal scarring, avoiding submammary incisions [2, 6, 10, 11, 13, 15, 18]. Further desirable attributes are long lasting breast projection and normal glandular function [5, 9, 16]. Most reports concentrate on technical refinements. A few articles describe the postoperative results objectively [14].

The aim of this study is to determine objectively if a technique with a short scar – a modified Lejour method – provides a better postoperative outcome when compared to a traditional method, such as that of Strömbeck.

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Material and methods

This study contains 163 patients (mean age: 41.7 years, range 15–68 years) who underwent a reduction mammaplasty in the years 1991 and 1992. The short scar technique of Lejour, without liposuction, was used in 70 patients (Group L = 43%) [10, 15] and Strömbeck's method with a superomedial pedicle of the areola complex in the remaining 93 individuals (Group S = 57%) [3, 12, 22, 23]. No random selection of patients was used, and the patients were operated on by a number of senior surgeons.

Each group was examined on average one year after surgery. At follow-up, three measurements were made in each case to determine the position of the nipple areola complex in relation to the jugulum, the submammary fold and the xiphoid. In this was, asymmetries were recorded. Perfect symmetry of the postoperative shape was classified as a very good result, less than 1.5 cm difference as a good result and 2 cm or more as a fair result [20]. The results in the last mentioned group were further defined as one sector-, two sector- and three sector form asymmetry. The pre- and postoperative breast volumes were determined using transparent plastic caps [21].

An asymmetry related to the breast volume was defined as a 300 ml difference at least from one side to the other [20]. The results in Group L and S were compared.

Preoperative status

Pain in the head and neck, the shoulders and the upper back area were the main indication for surgery in 133 out of 163 cases [9]. The mean preoperative breast volume in Group L was 1850 ml (range 900–4500 ml) and in Group S 2162 ml (range 900–4700 ml). A mean body overweight of 8 kg (range 1–17 kg) was seen in both groups. An asymmetric breast hyperplasia with differences of at least 300 ml was noted in 37 out of 163 patients (22.7%) equally distributed in both groups.

Surgery

Preoperative marking were done with the patient in a sitting position [20]. The vertical breast axis was marked in standard fashion. The centre of new nipple areola complex was placed 20–23 cm from the sternal notch and marked as a point on the vertical axis of each breast. The areolar margin was marked as a lying oval with a size of 5×7 cm around this point. The medial and lateral

Table 1. Patient material (n=163)

	Lejour	Strömbeck
Patients (n)	70	93
Preoperative breast volume (ml)	1850	2162
Preoperative asymmetry >300 ml	14	23
Weight of resected tissue (gl)	950	1071
Postoperative volume asymmetry >300 ml	8	4

Table 2. Early complications (n=163)

	Lejour	Strömbeck
Postoperative hemorrhage	3	3
Vicryl intolerance	10	5
Fat necrosis	13	4
Healing period (weeks)	5.3	2.5

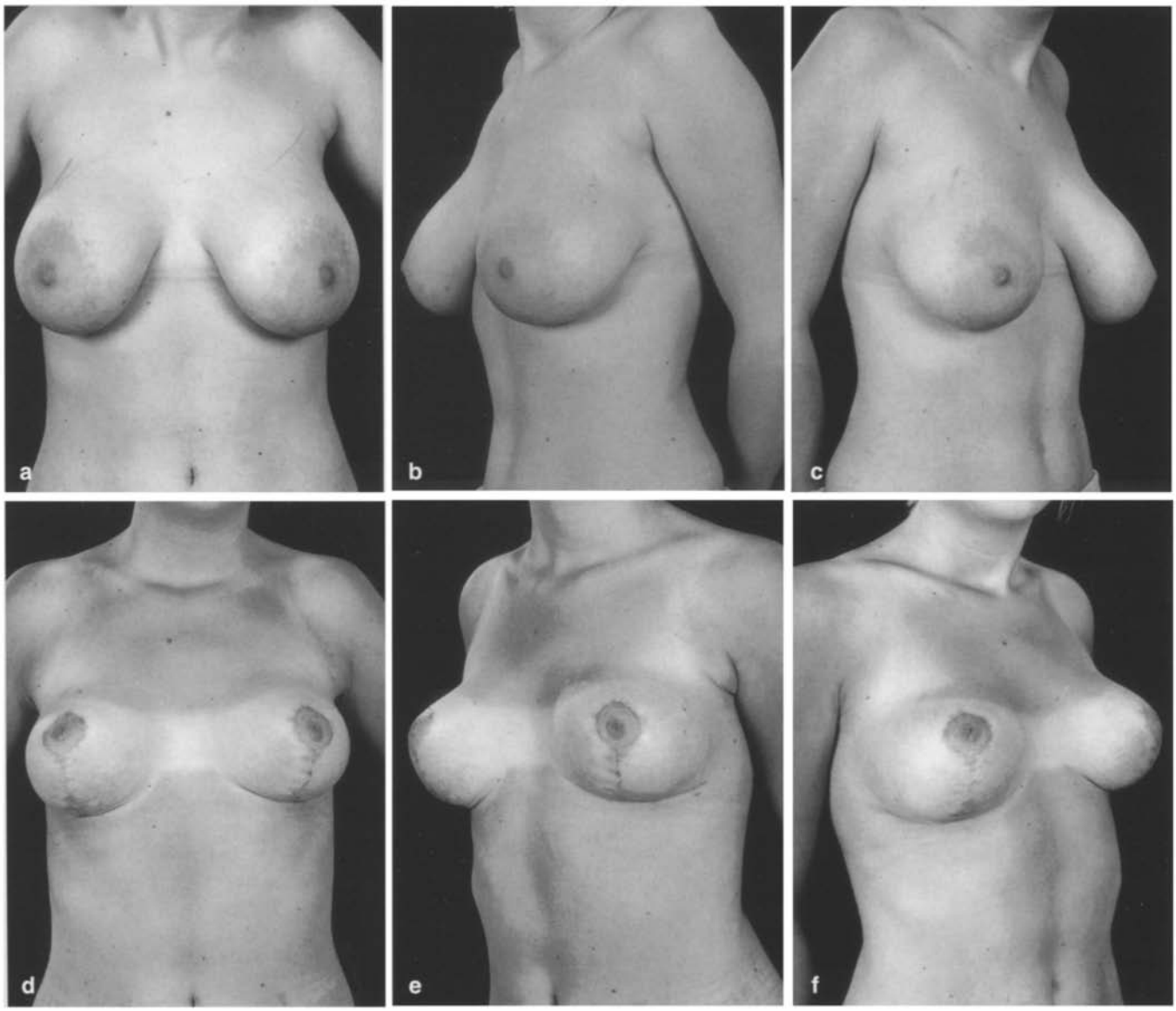

Fig. 1a–f. Reduction mammaplasty according to Lejour. Resected tissue 400 g/430 g, respectively. (**a–c**) Preoperative appearance. (**d–f**) Postoperative appearance at 14 months

skin excision line was determined by displacing the breast laterally then medially. These vertical lines were joined at a point 2–4 cm above the inframammary crease with Lejour's technique and with the ends of the submammary fold medially and laterally with Strömbeck's method.

The weight of the resected tissue in both groups ranged from 300–2700 grams in 154 out of 163 individuals. No glandular resection was performed in the remaining 9 patients. The mean resected tissue in Group L was 1370 grams and in Group S 1417 grams (Table 1).

Results

Early postoperative results

The mean hospital stay was three days (2–8) in both groups. Patients returned to work after 3.7 weeks as an average. Complications occurred in 38 out of 163 individuals (Table 2). The rate of early complications following Lejour's technique was 37% (26 patients) and

Table 3. Asymmetry more than 2 cm (n=36/163)

	Lejour	Strömbeck
One-sector	14	4
Two-sector	11	4
Three-sector	2	1

13% (12 patients) using Strömbeck's method. Vicryl intolerance and fat tissue necrosis were more frequent among patients in Group L. Postoperative hemorrhage was seen equally in both groups. Complete healing was achieved at 5.3 weeks in Group L and at 2.5 weeks in Group S as an average. The sutures were removed 2–3 weeks postoperatively.

Follow-up

Scar formation. Spread scars (2 cm or more) in the vertical subareolar areas and in the submammary fold were recognized in 66 out of 163 patients and were seen significantly more frequently in Group S (45 patients in Group S, 21 patients in Group L). Scar hypertrophy occurred in 10 patients of Group S, mostly in the periareolar area and the medial and lateral part of the submammary fold. No scar hypertrophy was observed in Group L.

Sensibility. Fifty percent of the individuals operated on according to Lejour's technique found that the nipple areola complex sensation was not affected one year after surgery and 50% expressed it decreased. The same results were seen with Strömbeck's method.

Postoperative form. One hundred twenty-seven out of 163 patients had very good results in postoperative breast symmetry (Fig. 1). The three measurements of these 127 patients were opposed to ideal values reported in the literature [1, 4, 5, 19].

The length of the distance jugulum-mamilla is considered to be ideal at 20–22 cm. The mean values in both methods can respond to these values (Group L mean 21.9 cm, range 18–25; and Group S mean 22.4 cm, range 20–26). A larger spread of values was found in Group L, indicating a too high or too low location of the areola.

If the ideal value of the distance mamilla-submammary fold should be 6–7 cm, it appeared that this distance was too long in both groups. The mean values of about 11 cm, range 7–14 in Group L were worse than in Group S presenting a mean of 8.2 cm and ranging from 5–13 cm. This distance represents indirectly the degree of postoperative breast ptosis.

The mamilla-xiphoid distance should be 10–12 cm and showed good average values in both groups (Group L 11 cm and Group S 11.5 cm).

In 36 cases, defined as fair results, side differences of more than 2 cm were noted. Moreover, the analysis of these poor results showed that 18 out of 36 individuals had one-sector asymmetry, 15 patients had a two-sector asymmetry and 3 a three-sector asymmetry (Table 3). Major asymmetries were mostly encountered in Group L.

Postoperative volume asymmetry (more than 300 ml difference) was seen in 12 out of 163 patients and mostly after Lejour's technique (8/12 patients).

Discussion

The results of this study have to be interpreted on the basis that the reduction mammaplasty with a short scar according to Lejour was introduced into our department in 1992, whereas Strömbeck's technique has been used for more than 15 years. No patient selection was performed. Both study groups were comparable in relation to the age of the patients, the preoperative volume of the breast, the weight of resected tissue, and the body weight.

The rate of early postoperative complications was low (37% in Group L and 13% in Group S, respectively) compared with the data presented in the literature [8, 12, 14, 17, 24]. There were no cases of nipple areolar necrosis. Fat tissue necrosis, vicryl intolerance with pustule formation and prolongated healing period were seen more frequently in Group L. The rate of fat tissue necrosis was 18% (13/70 patients) in this group, more than the expected rate in traditional techniques [2, 3, 6, 11, 12,

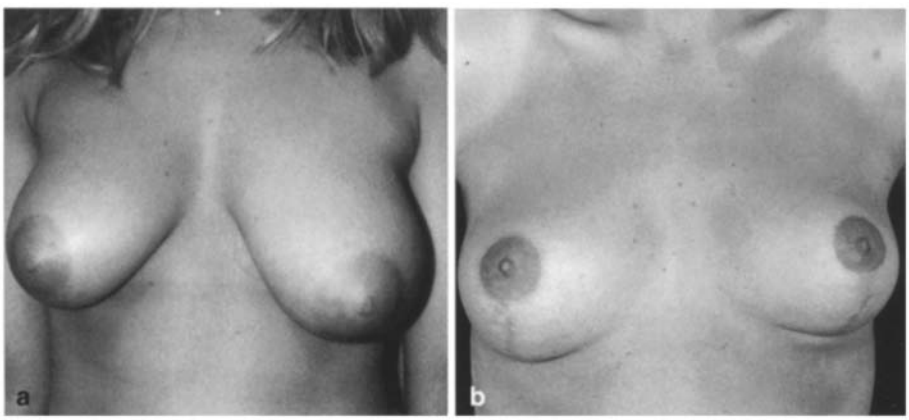

Fig. 2a, b. Preoperative breast asymmetry (**a**). Mammaplasty according to Lejour. **b** Sector and volume asymmetry even after the operation at 14 months follow-up

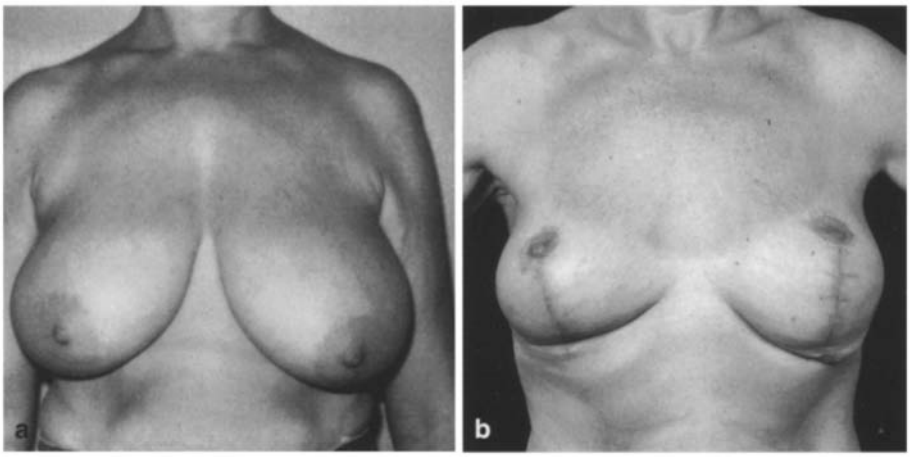

Fig. 3a, b. Reduction mammaplasty according to Lejour with a fair result because of improper adaptation of the residual breast pillars and insufficient skin gathering on the left side. **a** Preoperative appearance; **b** postoperative appearance at 12 months

15, 17, 20, 22, 23]. This complication was mostly noted when the weight of resected tissue exceeded 900 grams. Tissue strangulation by extensive gathering of skin in order to yield a short scar may be the main reason in these cases. The average three weeks longer healing period in Group L than in Group S could be explained by a too superficial placement of Vicryl sutures into the corium layer leading to a wound break down. A change of routine by placing Vicryl sutures in deeper subdermal layers will probably improve the healing process.

Form asymmetry up to 1.5 cm displacement was seen in 36/70 patients and more than 2 cm in 27/70 patients in Group L. Only 7 patients had excellent results in this group compared with 34 in Group S. When sector asymmetry was assessed, we found that 13 out of 27 patients were asymmetric in more than one sector. These fair results were obtained in patients who had a preoperative volume asymmetry (Fig. 2).

When the good and very good results were compared with ideal aesthetic values, it was found that the mean values of the jugulum-mamilla and mamilla-xiphoid distances were acceptable, but the Gauss distribution of these values was larger in Group L than in Group S, indicating failure in preoperative markings [10]. We do not agree with van Egmond [24] stating that the jugulum-mamilla distance increases in time. According to our experience, the main reasons for breast sagging is change in the length of the mamilla-to-submammary fold distance [7, 11, 19].

The length of the subareolar scar is a critical point in Lejour's technique. All surgeons wrinkled this suture line reducing its length from approx. 12 to 7 cm [10]. At follow-up, this subareolar vertical scar stretched again in almost all cases we examined, moreover, the mamilla-submammary fold distance had a mean of 11.5 cm (range 7–14 cm) and a ptosis recurred. The recurrence of breast ptosis lead to an upwards faced nipple areolar complex and in severe cases the nipple even can become inverted. To avoid this bad projection of the nipple areola complex and consequently a poor aesthetic appearance, considerable care had to be taken on the proper placement of the sutures at suturing the residual breast pillars together. Mastopexy was not used in this series, explaining the prolapse of the upper folds in a caudal direction. Patients with subareolar suture lines crossing the new submammary fold also had scars crossing the submammary fold.

Minor revisional surgery was done to resect dog-ear formation at the end of the vertical scar and/or perform a regathering of suture line in 5/70 (7%) patients in Group L.

Major revision surgery had been performed in 6/70 (8.5%) of the Lejour cases in order to eliminate the recurrent ptosis by shortening the extended vertical scar and further reduction of the breast.

In order to avoid revisional surgery because of postoperative shape asymmetry, there is no doubt that proper preoperative marking is of a great importance. A perfect collaboration and understanding between the surgeon and his assistant during the operation have a similar significance. When the glandular resection is done by the surgeon and the assistant sutures the wound, he/she should fully follow the surgeon's instructions concerning the distribution of the medical and lateral residual breast tissue and the rate and the way of gathering of the skin (Fig. 3).

The patient's acceptance of Lejour's method was excellent. Ninety-five percent of the patients were satisfied with the breast form and volume. Younger women appreciated the absence of scar in the submammary fold, while elderly women estimated that the breast looked natural.

Conclusions

Reduction mammaplasty with a short scar according to Lejour's technique can be recommended in patients having good skin elasticity. In elderly women with large breasts, traditional reduction techniques are preferred. Less complications in terms of fat necrosis are seen in Lejour's vertical reduction mammaplasty when the weight of resected tissue does not exceed 900 grams. Inverted Vicryl sutures should be placed deeply into the subcutaneous tissue layer. The new submammary fold should always be placed less than 7 cm distant from the nipple. According to our experiences, adaptation of the residual breast pillars and the subsequent skin gathering

are the most important moments of the operation which have to be done properly, preferably by one and the same person (surgeon) on both sides. Mastopexy down to the pectoralis fascia may have a prophylactic effect on reptosis. A randomized study is going on in order to analyze the long-term effects of mastopexy on the reptosis.

A continuous quality assessment is of great importance in order to improve the results of surgery.

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Invited commentary

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Doctor Berg and his co-authors have reviewed two series of breast reductions performed at Karolinska Hospital during the years 1991 and 1992, one with the method of Strömbeck, the other with a "modified Lejour" technique. The difference between the former and the technique I developed is in the marking, which, in their technique, is not made wider around the areola in large breasts. This may explain the increased fat necrosis and reduced postoperative nipple sensation that they have experienced. The reason given for the 18% fat necrosis is "tissue strangulation by extensive gathering of the skin". This is directly opposite to my technique which shapes the breast by glandular suture only, and not by skin suture: the skin should hang freely in the lower breast area after the glandular suture, it is never sutured under tension. Similarly, vicryl sutures should not be placed in the dermal layer; it is well known that this will induce a foreign body reaction.

The increase in the vertical scar length and the recurrent ptosis are probably due to omission of significant technical details, such as upper mastopexy and secure suturing of the glandular pillars. In my own series, the vertical scar does not stretch, and the shape of the breast is the same in most of the cases after three months and after one year. The small number of lower dog-ear revisions (7%) is surprising in such an early experience with

the method. This may be explained by the larger number (8.5%) of major revisions which would have taken care of the lower scar.

Three cases are shown to demonstrate the results, the first two are excellent. The third shows ptosis probably related to the reasons mentioned above. The authors state that 95% of the patients were satisfied with the "Lejour method", and they recommend the technique for patients having good skin elasticity. It is certainly a safe recommendation for those who want to begin using the method. It is obvious that there are fewer complications when the weight of resected tissue does not exceed 900 g. Is this not true for all methods? That was already noted by Strömbeck in his thesis. In a recent review of my own complication rate with regard to healing problems, there was a total of 3%, but in large breasts (with over 500 g resected), it was 7%, and in very large breasts (with over 800 g resected), it was 17%. When obese patients had very large breasts, it reached 44%! These were fortunately cases of delayed healing, none of which required early reoperation, and only one required a later correction under general anesthesia.

When comparing the complication rate of the vertical mammaplasty with the Strömbeck method, which we had used for many years, there was not only better late results, but also a striking decrease in the number of complications, including areolar necrosis. Dr. Palmer's team must be commended for having no necrosis in both methods, even in very large breasts; this is certainly due to the fact that senior surgeons were performing the surgery. When reviewing the complications at the Department of Plastic Surgery of the University of Brussels, it was found that surgeons with less than three years of experience had 12% complications, and surgeons with more than three years only 3%.

In conclusion, I congratulate Doctor Palmer and his team for having had the courage to change their technique to reduce the amount of scarring, after having had a long and satisfactory experience with the Strömbeck technique. Their results are already very good, and with the addition of some details, they will be excellent. Vertical mammaplasty is not only a technique which leaves less scars, it also creates breasts with a better shape and more lasting results.

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