Modified "Lejour Technique":
A Safe Option for Large Breasts Reductions

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ABSTRACT
The concern with scar length in breast reduction led to the development of several techniques ending with a short scar. Lejour technique is regarded as one of the most controversial of these procedures. The safety of the superior pedicle, wide skin undermining, the abnormal early postoperative shape and dog-ears at the end of the vertical scar are regarded as tradeoffs which made many surgeon advise to perform this technique in a small to moderate breast reductions.

By modifying few steps in the procedure, the author developed a safe technique with reproducible results even in gigantomastic reductions. These modifications did not compromise the final outcome of the surgery and maintained the beautiful coning of the reduced breast with upper pole fullness, which are the main virtue of the original technique. Moreover, with only 2 major complications out of 42 reductions, the safety is ensured even in obese patients with huge breasts.

INTRODUCTION
The principle of breast reduction with short vertical scar was introduced by a number of French speaking surgeons along the past century. Dartigues first described the concept in 1925 [1]. Claude Lassus in 1970 published his own version of the vertical scar breast reduction without undermining [2]. Madeleine Lejour from Belgium further modified the technique by adding liposuction and gland undermining below the pedicle as well as under the skin [3].

The idea of performing a reduction mammoplasty with a short vertical scar ending at the inframammary fold is definitely appealing for both the surgeon and the patient. Yet, vertical scar reduction has been slow to achieve widespread acceptance especially in the United States [4,5]. The scepticisms aroused mainly for the following points. First, the scar puckering around the vertical wound needs weeks to resolve and sometimes may necessitate revision. Moreover, in large reductions the scar may descend with time on the abdomen. Second the marked folding of the superior pedicle in large breast reductions with possible vascular compromise to the nipple and areola. The technique is a free-hand style, relying on surgeon judgement for glandular resection rather than fixed measurements. Last but not least the distorted shape of the breast at the end of the procedure and in the early postoperative phase aroused the anxiety of the patient and the surgeon about the late outcome. For all these reasons, the technique was reserved mainly for small to moderate breast reduction [6-8].

In this article, the author presents some modifications to the original Lejour technique that eliminate the inconvenience encountered and make the procedure applicable for all types of breast reductions even in very large ptotic breasts.

PATIENTS AND METHODS
Between March 2006 and august 2008, 22 patients have undergone breast reductions using the modified Lejour technique. 2 patients have undergone unilateral breast reduction for asymmetric breasts. The remaining 20 patients have undergone bilateral reductions. 6 out of the 22 patients have undergone reductions between 550g and 700g. Large reductions exceeding 700 g were performed on the remaining 16 patients. The least follow-up time was 6 months while the maximum follow-up period was 14 months.

Surgical technique:
The preoperative drawings are performed with the patient standing in upright position. The midline of the body is marked from sternal notch downward between the two breasts. The future nipple level is then positioned 2cm above the infra-mammary fold along the breast meridian in case of moderate reduction and at the level of the fold in case of large reduction. A useful way to mark the fold is to place a measuring tape under the breasts and place a mark at the top margin of the tape between
the 2 breasts in the midline as described by Findlay [4]. The meridian of the breast is then drawn 5cm from the sterno-clavicular junction. The bisection of the meridian and the extension of the inframammary fold mark define the exact future nipple position. The upper border of the areola is marked 2cm above the future site of the nipple, point A.

The vertical axis of the breasts is then marked. The axis of the breast is a line drawn 10 to 12cm from the midline extending from the inframammary fold vertically downward on the abdomen. The wider the chest, the farther the distance the axis will be from the midline. Pushing the breast first medially and then laterally with an upward rotation movement in continuity with the vertical axis drawn below the breast makes the markings of the vertical wedge excision (Fig. 1a). Those two lines determine the extent of resection and are joined at point B, 2cm above the inframammary fold. In case of large resection, point B can be further elevated by 3 or 4cm in order to avoid the scar extending over the abdomen. From point A, 2 curved lines are drawn till they join the upper ends of the two lines marking the vertical resection at points C and D respectively (Fig. 1b). The distance between point A and points C & D respectively should be equidistant and measures around 8cm. It is to be noted that point C & D represents the highest end of vertical resection and by joining them a circle is formed between the points A, C and D whose circumference will conform to the diameter of the future nipple. The de-epithelisation area is then marked by a curved line joining the two points C & D and extending below the areola by 5cm (Fig. 1c).

Under general anaesthesia, the patient is placed in the supine position. The diameter of the nipple and areola complex (NAC) is determined using a template. It may vary between 4 and 5cm depending on the size of the breast. The tourniquet is applied and de-epithelisation is done very cautiously trying as much as possible not to injure any of the superficial veins converging toward the nipple areola complex especially in large ptotic breast. If this step is done imprudently venous congestion of the nipple and areola is likely to occur especially after major breast hypertrophy in which the nipple must be elevated more than 12cm.

A strong slowly resorbable suture attaches the under surface of point A to the pectoralis fascia at the highest level of the dissection. This suspension suture elevates the breast creating a temporary upper pole bulge and relieving tension on the lower half of the breast during the healing phase.

The areola is then sutured into place followed by the two pillars joined in the midline with 4-5 deeply placed heavy absorbable sutures starting from below the areola. This sutureing of the gland shapes the breast creates it conical appearance and progressively reduces the size of its base. The height of the pillars is kept at 8cm in most reductions however, in case of very large reductions with sternal notch to nipple distance exceeding 35cm or resection of more than 1500g the pillars projection may reach 10cm. One very important point as stressed by Lejour is not to leave much tissue in the lower pole below the areola (Fig. 2). The remaining caudal gland pillars are resected so as to leave a flat lower pole. If this is not the case, the late result will be unsatisfactory, showing bottoming out, lack of upper pole fullness and an upward pointing areola.

At this stage a 3mm Mercedes cannula is introduced through the new inframammary fold and liposuction of the breast tissue is performed lateral to the anterior axillary line for more definition of the breast mound.

For skin closure, the skin along the two vertical pillars is undermined on each side for few centimetres only and the closure is achieved in 2 planes. The thickness of the subcutaneous fat of the undermined breast skin is kept at 0.5cm. Several subdermal purse string stitches are placed from base to top including the superficial part of the
gland trying to shorten and gather the scar cephalically. The purse-string sutures at the lower end of the scar incorporate also the pectoralis fascia just below inferior end of the two glandular pillars. By doing so, the most inferior extent of the scar is anchored to the future inframammary fold. Such closure creates wrinkles that will disappear in the early postoperative period. Subcutaneous sutures further gather the skin and finally a running subcuticular suture terminates the closure. Suction drains are routinely placed along a separate incision and are usually removed within 48 hours.

The aim of this closure is to reduce the vertical scar length to 8cm in most reductions. In case of large reductions, the vertical height of the pillars may reach 10cm and so the scar may be left as long as 12cm. If dog-ears are present they are better left than excised immediately.

RESULTS

A total of 42 breast reductions were performed using the modified Lejour technique. Reduction ranged from 600g to 2100g (average 1110g) and all breasts were closed in a vertical scar fashion (Figs. 3,4). Apart from 2 cases all the patients showed an uneventful postoperative period. One patient showed severe infection at day 8 which necessitated readmission and drainage of pockets of pus. She was re-operated upon 45 days later for wound closure and the final result was suboptimal. The second patient showed bilateral venous congestion of the nipple and areola complex and partial sloughing which was managed conservatively and the wound healed after 3 months with visible scarring at the region of the areola. No other major complications as seroma, hematoma, NAC ischemia or major wound dehiscence were recorded. Nipple sensation was preserved in all cases except in 3 patients with sternal notch to nipple distance exceeding 40cm. The folding of the dermoglandular flap for nipple elevation necessitated thinning of the flap to 2cm, which didn’t affect the vascularity of the NAC but instead the sensation was lost (Fig. 5). For the 20 patients free from complications they were totally satisfied with the result and never found the exaggerated upper fullness in the early postoperative period an inconvenience. Even in the two patients with complications they were contented with the outcome and appreciated the vertical short scar as they did see before the result of their relatives who were operated with an inverted T technique. In 3 patients, scar revision under local anaesthesia was performed between 6 and 8 months to correct the residual dog-ears and all ended in a transverse scar less than 7cm exactly in the fold. This ancillary procedure was not considered a complication and caused no dissatisfaction for the patients. Beside the short scar, all patients were pleased with the upper pole fullness and well-maintained breast projection (Fig. 6).

Fig. (1): The markings of Lejour technique. A: Point A is marked at a level 2cm above the future site of the nipple. Points C and D are the junction between point A and vertical markings in continuity with the lower vertical axis of the breast drawn by pushing the breast first medially upward and laterally downward. The distance between AC and AD should be rather equal measuring around 8cm each. B: Lower curved marking where line C’ and D join in the middle of the breast at point B 2.4cm above the fold. C: The area in blue color on the left breast depicts the zone of de-epithelisation and comprises the zone between ACD and extends about 5cm below the areola.
Fig. (2): The final result on the operating table. (Left) The nipple should be looking slightly downward and the vertical scar is kept at 8cm length. (Right) Note the exaggerated upper pole fullness and almost empty lower pole.

Fig. (3): A 52 years old female patient presented with bilateral gigantomastia. Sternal notch to nipple distance was 44cm bilaterally. (Left) preoperative views. (Right) 9 month postoperative results after vertical scar mammaplasty with removal of 1900g on each side and nipple elevation by 23cm.

Fig. (4): A 30 years old female with bilaterally enlarged breasts. Sternal notch to nipple [S-N] distance measured 34 cm on the right and 33 cm on the left. (Left) preoperative (Right) 7 month postoperative views. The new [S-N] distance was adjusted at 21cm. The right breast was reduced by 900g and the left by 780g.
Fig. (5): Intraoperative view of the superior pedicle in a patient with Sternal notch to nipple distance 42cm. (Left) Note the level of de-epithelisation with preservation of the superficial veins converging towards the nipple and areola. (Right) the thickness of the pedicle is reduced to 2cm without any vascular compromise to the NAC.

Fig. (6): A 22 years old female patient with large ptotic breasts. (Left) preoperative and (right) 10 month postoperative with well maintained projection and upper pole fullness.

Fig. (7): Skin undermining. A. The pattern of skin undermining as described originally by Lejour encompassing the whole lower pole from point C & D and extending both inferiorly and horizontally till the medial and lateral extents of the fold. B. The modification suggested by the author limiting the dissection to 5cm around the vertical scar and down to the inframammary fold.
DISCUSSION

All vertical scar techniques have one principle in common: Two, medial and lateral, pillars are developed after a central glandular resection. By suturing those two pillars together one can achieve coning of the breast with adequate projection as well as narrowing of the base \[9,10\]. In other terms, suturing the gland creates the shape of the breast and it does not rely on the skin to maintain its form as in the inverted T inferior pedicle techniques. Unfortunately, due to gravity as well as the weight of the remaining gland, the skin closed tightly to shape the breast will stretch causing bottoming out, loss of projection and eventually a boxy shape. Breast all these are the main sequalea seen with the inferior pedicle inverted T scar techniques \[11,12\].

Several techniques ending in short vertical scar has been described during the last 3 decades with variations of the pedicle and pattern of resection. Lassus, Marchac and Lejour use the superior pedicle in all their reductions. Hall-Findlay found that the medial pedicle is more versatile and reliable than the superior pedicle, which in her opinion, is reserved mainly for very small reductions and mastopexies \[8\]. However, upper pole fullness and projection were less than optimal at the end of the operation when compared with those of the superior pedicle. Hammond developed the inferior pedicle technique so that the final scar ends in nearly a vertical fashion. He believes that by maintaining an intact Scarpa’s fascia insertion in the area of inframammary fold, the loose submammary space is not opened and the breast cannot drop postoperatively under the influence of gravity \[5\]. Thus bottoming out phenomenon noted with the standard inverted T type of inferior pedicle is obviated. This may be true however reduction of the breast base will be compromised.

Of all the vertical scar techniques, the one described by Lejour proved to be versatile if some modifications are taken in considerations. Limited lateral liposuction and minimal lower skin undermining are performed but not as originally described (Fig. 7). Lejour completed the skin undermining just after the de-epithelisation and before glandular resection. The author differs the skin undermining till after glandular shaping with sutures and limits it to around 5cm from the edges of the vertical scar. The lateral liposuction allows more lateral reduction and shaping of the breast and is done at the end of the procedure. Lower skin undermining is important for skin retraction but it is done conservatively so as to avoid any compromise to the blood supply of the skin flaps. Moreover the height of the pillars is limited to 8cm (10cm in large reductions) and a superior dermoglandular pedicle of at least 3cm in thickness. In the preoperative drawings, the nipple position is kept 2cm above the inframammary fold in moderate reductions and at the level of the fold in large reductions. The cause of this shift is that in large reductions, the residual breast tissue forming the pillars is longer (10cm) and heavier hence the breast is prone for more descent with time. Moreover, after large volume reduction the nipple tends to reside higher than the preoperative planning as the upper pole of the breast is freed from the weight of the pendulous part of the breast. If this slight postoperative glandular ptosis with over-retraction of the nipple are not anticipated before surgery, an upward looking high riding nipples will issue. The inferior limit of the vertical scar is closed in a purse-string fashion and anchored to the lower end of the glandular pillars thus guaranteeing that it won’t descend beyond the future inframammary fold. Of course this may result in scar puckering and some skin excess below the new inframammary fold. After 3 months these deformities shrink and disappear in patients with good skin tone. Even if revision of the scar is necessary, the resulting length of the horizontal scar is much smaller than when attempted immediately during the reduction. All the above modifications turn the original Lejour technique more versatile and safe even in gigantomastatic patient while keeping all the virtues of the procedure.

Summary:

The technique suggested by the author is derived from Lejour pattern of breast reduction and mastopexy. The introduced modifications allow the achievement of good cosmetic results in large breast reductions with safer and less traumatizing manoeuvres. A learning curve may be required as with any other procedure but the gratifying results should encourage any surgeon to be familiar with the technique.

REFERENCES


