I was trained in the mammoplasty procedure described by Biesenberger in 1931,1 which remained the most popular mammoplasty technique into the 1970s and 1980s. With this procedure, the skin is widely undermined from the gland (Figure 1A). After glandular resection (Figure 1B), the breast cone is reconstructed (Figure 1C and 1D); the skin is redraped over the new breast; and the excess skin is resected, resulting in an inverted-T scar (Figure 1E). While the immediate results obtained by this technique were good, bottoming out often occurred postoperatively because the technique relied on skin resection to shape the breast. Another (more worrisome) issue was the high incidence of complications immediately postoperatively, including seroma, hematoma, infection, skin necrosis, and gland and fat necrosis. A more serious consequence was partial or total loss of the nipple-areola complex (NAC). I recall that, during my years of residency, I was always concerned about whether the areola would be blue or pink when the dressing was removed on the day after surgery.

At the end of 1963, I had the opportunity to attend a meeting in Vienna where Dr. Skoog presented his new mammoplasty technique2 in which skin, fat, and gland were removed “en bloc” with a Wise-pattern resection, without any skin or glandular undermining. With this technique, the NAC was transposed on dermoglandular flaps (bipedicle, medial, or lateral). This presentation was a revelation for me. Soon after my return to Nice, I tried the Skoog technique, which resulted in the terrible scars seen in Figure 2. Even though the patient was happy with the result, I was disheartened to have inflicted such a permanent stigma of surgery on a young woman, and I resolved to never again finish a mammoplasty with an inverted-T scar. Also influencing this decision was the topless fashion taking hold in the 1960s on the Cote d’Azur; many candidates were presenting for mammoplasty and telling me that they wanted to avoid the “horrible scars” they had observed on other women on the beach.

**EVOLUTION OF THE VERTICAL TECHNIQUE**

Skoog was performing a Wise-pattern en bloc resection with a bipedicle flap to elevate the NAC and finishing with an inverted-T scar. I decided to follow his basic principles but to perform a conical wedge resection with a superior pedicle flap, finishing with a vertical scar (Figure 3A). At that time, I was unaware that Lötsch in 1923,3 Dartigues...
in 1924, Arie in 1957, and others had already described mammaplasties finishing with a vertical scar. My first operation addressed correction of a unilateral breast hypertrophy (Figure 3B and 3C). I was pleased with the first results, so I continued to employ this technique, confirming that I could achieve conical projected breasts (Figures 4 and 5). I first described the operation in the literature in 1969, followed by another article in 1970. In 1975, Vogue magazine published a good article about my technique, in which it was referred to as "the unique scar." The term vertical technique later came into the vernacular, but I am uncertain who coined it or when it first appeared.

I did not market or promote my technique for several reasons. At that time, patients and plastic surgeons were focused almost exclusively on finding a safe means for reducing large breasts; that is, they were not as focused on the scar as we are now. Moreover, most plastic surgeons did not believe that it was possible to reduce large breasts with only a vertical scar. In fact, in those days, treating very large breasts with my technique involved a vertical scar that crossed the inframammary fold (IMF) (Figure 6).

To eliminate the drawback of a scar that crossed the IMF, I made the following modifications. When I first performed the procedure, the lower point of the resection area defined in the preoperative markings (henceforth, Point B) was located at the crossing of the vertical axis of the breast with the IMF. In the early 1970s, I decided to move this point 3 cm above the IMF (Figure 7). In doing so, I finished with a shorter vertical scar. However, at that time, I still naïvely believed in the dogma decreeing that a vertical scar must never be longer than 5.5 cm. To comply with this rule, I resected a triangle of skin (Figure 8A) so that I could finish my mammaplasty with a 5.5-cm-long vertical scar plus a short horizontal scar (Figure 8B and 8C). I presented this technique in 1977 in Tokyo then in 1978 in Koln and published it in an article that appeared in 1981. These were the first descriptions of a short horizontal scar technique.

After I had performed a large number of short horizontal scar techniques, I noticed that some months after surgery, the horizontal scar had moved above the IMF (Figure 9) and was appearing at the lower pole of the breast, which had dropped, resulting in ptosis. Measurements of young women with ideal breasts documented that the actual distance from the lower border of the areola to the IMF could vary significantly and be as much as 9 cm or more.

This observation led me to reject theories about limiting the size of the vertical scar. In patients who had undergone any kind of inverted-T scar technique, it was noticeable—months or years postoperatively—that the horizontal scar (short or long) was located well above the IMF. Why? With these techniques, the glandular resection is achieved with the Wise pattern, which means that a large proportion of the resection is horizontal and performed above the IMF, resulting in a new IMF located above the previous one. However, the breast is not attached to the pectoralis fascia; it glides over it until stopped by the initial IMF, which is solid and fixed. The same phenomenon occurs when liposuction is performed.
to remove tissue above the IMF in mammoplasties finishing with a vertical scar. In both cases, the gliding of the breast results in a flat upper pole, hyperfullness at the lower pole, and ptosis. In other words, the IMF position can be changed only temporarily. This is why low-breasted patients cannot be transformed into high-breasted patients, which is in turn why one of my key maxims is to stick to the original IMF for long-lasting results. I emphasize again that the initial position of the IMF cannot and must not be changed.

**The Conical Vertical Wedge Resection**

The second and most important concept of my technique is reduction of the breast size with a conical vertical wedge resection. Pinching the medial inferior aspect of the breast with the fingers produces a projected breast with a full upper pole (Figure 10). To achieve the same result surgically, I performed a conical vertical wedge resection (Figure 11). After resection, the lateral parts of the remaining breast were brought toward the midline to reconstruct the breast (Figure 12A and 12B); this maneuver achieved exactly the same result as pinching the medial inferior aspect of the breast with the fingers (Figure 12C). In my opinion, this resection is crucial for achieving fully-projecting breasts with a full upper pole for the following reasons.
Figure 5. These results, from my fifth case, represent my first attempts at correcting breast hypertrophy with my vertical technique. Originally published in Lassus.⁶
First, the closure of the defect resulting from this type of resection reduces the diameter of the breast base. Second, breast volume at the upper pole remains unchanged after the resection; consequent to the reduction of the base, breast contraction produces more fullness at the upper pole. Third, the closure of the defect pushes the lateral and inferior portions of the breast upward and forward. Fourth, the IMF remains unchanged in my technique, which maintains the breast in its new position. Fifth, the ptotic portion of the breast is eliminated by the resection. Last, the upper pedicle flap adds volume at the top of the cone. All of these factors combine to ensure that the achievement of projecting breasts with a full upper pole will be maintained over the long term.

**Figure 6.** (A) This 18-year-old woman presented for correction of breast hypertrophy. Her very large breasts were reduced with a vertical scar crossing the inframammary fold. (B) One year after vertical mammoplasty (my second case).

**Finishing With a Vertical Scar That Does Not Cross the IMF**

Suturing the lateral parts of the breast on the midline after performing vertical wedge resection produces two dog ears. One is located at the upper extremity (Point A); this dog ear allowed me to inset the NAC without any preoperative marking. The other one is located at the lower extremity of the vertical scar (Point B; Figure 13A), which presents a problem. I was able to remove it with a full-thickness elliptical resection (Figure 13B and 13C). This elliptical resection elongated the scar. If Point B was positioned at the intersection of the IMF with the vertical axis of the breast, the scar would cross the IMF (as described previously), so I began to position Point B above the IMF. Its exact position depended on the size of the dog ear, which in turn depended on the size of the breast. In small hypertrophic ptotic breasts, the dog ear was small, so Point B was positioned 3.5 cm above the IMF. In average hypertrophic ptotic breasts, the dog ear was larger, so Point B was positioned 5 cm above IMF. In large hypertrophic ptotic breasts, the dog ear was correspondingly large, so Point B was positioned at 7, 8, or 9 cm above the IMF. After the elliptical resection, the shape of the breast was rarely satisfactory; therefore, it was necessary for me to reshape the breast with skin sutures until a satisfactory form was achieved. This step could also lengthen the scar; consequently, the end of the vertical scar after the elliptical resection has been performed must be at 1 cm above the IMF in cases involving small breasts, 2 cm in those involving average-sized breasts, and 3 cm in cases involving large breasts. Respecting these guidelines enabled completion of the procedure while maintaining the vertical scar above the IMF.

**Figure 7.** Initially, I defined the lower point of the resection area at the crossing of the vertical axis with the inframammary fold (lower B marking). In the early 1970s, I modified my technique to move the point upward, 3 cm above the inframammary fold (B').

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**Figure 6.** (A) This 18-year-old woman presented for correction of breast hypertrophy. Her very large breasts were reduced with a vertical scar crossing the inframammary fold. (B) One year after vertical mammoplasty (my second case).
Sculptors rely on landmarks to achieve their work; they never use a pattern. Similarly, I relied on landmarks rather than a preoperative pattern to perform my technique, focusing on two key points: Point A, which marked the new position of the upper border of the areola, and Point B, which marked the lower point of the estimated area of resection.

**Markings**

The midline and the vertical axis of the breasts were first marked. The distance between the acromion and the olecranon was then measured. I marked the midpoint and another point located 2 cm below it. From

**OPERATIVE TECHNIQUE**

Working on breasts, like working on the nose, is sculptural in that it involves work in three dimensions. Sculptors rely on landmarks to achieve their work; they never use a pattern. Similarly, I relied on landmarks

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**Figure 8.** In my early technique, I adhered to the maxim cautioning that a vertical scar should never be longer than 5.5 cm. (A) A triangle of skin is resected to allow the scar to remain within the guidelines. (B) The vertical scar crosses with a short horizontal scar. (C) The vertical portion of the scar is 5.5 cm.

**Figure 9.** After performing a large number of operations with the short vertical scar shown in Figure 8, I noticed that patients’ scars were moving above the inframammary fold and appearing at the lower pole of the breast, which had dropped.

**Figure 10.** Pinching the medial inferior aspect of the breast with the fingers demonstrates a projected breast with a full upper pole, similar to what is surgically achieved through conical wedge resection.
this last point, I drew a horizontal line that crossed the vertical axis of the breast. The intersection of the line and the vertical axis marked the new position of the upper border of the areola (Point A)—not the new nipple position (Figure 14). Placing this mark avoided the mistake of positioning the nipple too high. Point B was located on the vertical axis of the breast above the IMF; the exact distance above the IMF varied, according the degree of ptosis, as explained previously (Figure 15). Once these two points were defined, I drew the estimated area of resection: I emphasize the word “estimated” because it was impossible to preoperatively estimate the exact amount of tissue removal necessary to achieve a correct reduction of breast volume. I performed these markings as I did in my original procedure, by pushing the breast laterally and joining Point A to Point B, then pushing the breast medially and joining A to B (Figure 16). To complete the markings, I drew the upper pedicle flap or the medial flap.

Figure 11. The surgical technique for conical wedge resection.

Figure 12. (A) After a conical wedge resection, the lateral parts of the remaining breast are brought toward the midline to reconstruct the breast. (B) The closure of the defect pushes the lateral and inferior portions of the breast upward and forward. (C) Postoperatively, the shape is conical and projecting, achieving nearly the same shape as pinching the breast with the fingers (shown in Figure 10).
Figure 13. (A) My vertical wedge resection produces two dog ears. (B) The dog ear at the lower extremity of the vertical scar is removed with a full-thickness elliptical resection (C). After reconstruction of the breast, the vertical scar finishes at the level of the IMF.

Figure 14. Preoperatively, the midline and the vertical axis of the breast are marked. The distance between the acromion and the olecranon is measured, and two marks are made: one at the midline and another 2 cm below it. From this last point, a horizontal line is drawn that crosses the vertical axis of the breast. The intersection of the line and the vertical axis marks the new position of the upper border of the areola (Point A). Note that Point A is not the new nipple position.

Figure 15. In the preoperative markings, Point B is located on the vertical axis of the breast, above the inframammary fold. The exact distance above the IMF varies according to the degree of ptosis.
After the preoperative markings were complete, the patient was placed on the operating table in a semisitting position with the arms along the body. This positioning allowed me to check the volume of the breasts, their symmetry, the symmetry of the nipples, the length of the vertical scar, and the shape of the breasts throughout the course of the operation.

**Surgical Procedure**

Patients were placed under general anesthesia. Following de-epithelialization of the superior flap, the lateral-margin markings below the nipple flap were incised to the pectoralis fascia (Figure 17A). This lower central part of the breast was elevated from the chest wall at the level of the submammary fold (Figure 17B). The inferior border of the areolar flap was cut to a depth of 7 to 8 mm, and dissection proceeded upward to Point A, leaving a glandular lining underneath the flap (Figure 17C). Resection was completed by cutting the lateral-margin markings of the glandular tissue located underneath the areolar flap.

The central wedge resection was then performed. The resection was divided in two portions: an inferior portion composed of the en bloc resection (skin, fat, and gland) and a superior portion composed of fat and gland only (Figure 17C). No further undermining was performed—this is a key feature of the technique. The skin remained attached to the gland, and the gland is attached to the pectoralis (Figure 17C). These principles ensured the safety of the vertical technique. The breast was then reshaped by drawing together the lateral portions of the amputated gland, with skin-framing stitches made downward to upward. This maneuver yielded an inferior dog ear, which was removed as previously described.

At that point in the operation, the form of the breast was suboptimal. It was therefore reshaped with skin stitches until a satisfactory shape was obtained. Once this was accomplished, the new suture line was marked with methylene blue: three or four horizontal lines were marked on both sides and numbered, with the numbers corresponding for each side (Figure 17D). The skin stitches were cut, and the new marking delineated the complementary full-thickness resection to be performed. After that, the skin remained attached to the gland, and the gland was attached to the pectoralis (Figure 17E). The skin edges were then approximated, uniting Point 1 to 1, 2 to 2, 3 to 3, and so on (Figure 17F). This method saved time and avoided any mistakes in the reshaping of the breast. Suturing was performed in two planes: one row of inverted stitches of a permanent monofilament into the deep dermis and a second row of subcuticular sutures (Monocryl 2/0, Ethicon, Inc., Somerville, New Jersey). This technique joined together two composite blocks of skin, fat, and gland. Because no undermining was performed during the procedure, drainage was not necessary. Patients were discharged the same day as surgery or the next morning. The intradermal running sutures were removed three weeks later. Patients were instructed not to wear a brassiere for three months, until the breasts assumed their final shape.

Postoperative healing produced a solid fibrous band, which supported the breast in a fashion analogous to the way a whalebone provides support in a corset, yielding good breast projection and durable results. The vertical technique does not rely on the skin to play the role of a brassiere in supporting the breast and consequently avoids the scar dehiscence that can be associated with reliance on skin redraping for breast support.

A video demonstration of the author’s technique. A series of videos demonstrating each of these operative techniques is available at www.aestheticsurgeryjournal.com. You may also use any smartphone to scan the code on the first page of this article to be taken directly to the video on www.youtube.com.
As outlined by Mejia and Nahai, vertical mammoplasty has a low incidence of complications. Those that do occur can vary, depending on the patient’s body mass index and the amount of resection performed, since large resections can lead to scar enlargement and other problems. However, providing data on postoperative complications is not always easy. Although most of my patients were followed for six weeks postoperatively, a large number of patients were lost to follow-up after this time. Furthermore, some patients who were disappointed with their results may have sought out another surgeon without informing me of any problem.
Consequently, it is much easier to report on immediate postoperative complications than it is to report on those that develop over the long term.

Between 1964 and 2006, I treated a series of 2000 breasts with six months of follow-up. Since patient population demographics can affect the number and type of complications, I asked some of my colleagues for information on their results—namely, Lacotte, who practices in the Caribbean, and Djemal, in Tunisia. Both authors have presented their results and provided information to me in personal communications.

In my series, I encountered the following complications. One patient experienced a seroma after vertical wedge resection with cautery. After I resumed use of the blade to perform resections, no other cases of seroma occurred. Two cases of hematoma occurred in this series—one three days postoperatively and one five days postoperatively. There were no cases of infection nor any
cases of skin, fat, or gland necrosis. Before 1995, I had two cases of total NAC necrosis and 17 cases of partial necrosis. Until 1995, I always performed the operation with an upper pedicle flap, which resulted in partial or total loss of the NAC in some patients. It took a long time for me to understand that when the NAC was moved upward more than 9 cm, the “kinking” of the pedicle could compromise the venous blood return and, thus, the NAC in some cases. Once I understood this, I decided to perform a lateral or medial pedicle flap when the NAC climbed more than 9 cm. This eliminated the problem, and there were no further cases of NAC necrosis after 1995. I had four severe cases of hypertrophic

Figure 21. (A) Inadequate postoperative breast shape two weeks postoperatively. (B) Two months postoperatively, without any revision. Given results like these, I believe that it is wise to wait at least two months before undertaking any revision.

Figure 22. (A) Excessive scarring and persistent postoperative dog ear on the lower end, corrected by skin resection (B) and suturing (C).

Figure 23. Enlarged postoperative vertical scarring.
scarring (Figure 18), three cases of periareolar scar dehiscence caused by excessive tension on the sutures (Figure 19), 17 cases of volume asymmetry (Figure 20), 14 cases of NAC asymmetry, and 56 cases of inadequate breast shape (Figure 21), which I revised. Before 1975, I had 81 cases of excessive scarring (Figure 22), 21 of which I
revised after 1975. Before 1975, scar length was not considered the major factor in assessing results, although it became so in later years. There were 11 cases of enlarged vertical scars (all revised by me; Figure 23) and two cases of operative enlargement of the breasts.

In Lacotte’s series of 1200 breasts, the average per-breast resection was 785 g, and the maximum was 3 kg. His complications included 96 cases of seroma (he occasionally performed liposuction as part of his breast reduction technique), six cases of hematoma, two cases of partial areola necrosis (his technique always includes a superior pedicle flap), and 108 cases of wound dehiscence. Note that Dr. Lacotte’s practice involves working with a population group in whom obesity tends to be more prevalent than it is in my patients—this is important because the percentage of complications will be higher in patients who have a body mass index over 30 and/or hypertension.

In 2008, Djemal provided data on a series of 721 patients treated with my technique. His series included seven cases of seroma, five cases of hematoma, eight cases of glandular infection, 15 cases of superficial wound dehiscence, 20 cases of scar revision, eight repeat reductions, four inverted nipples, and eight patients with loss of nipple sensitivity. He reported no cases of fat necrosis or nipple loss.

Clinical results from my patients at different stages of long-term follow up are shown in Figures 24-28.

**DISCUSSION**

The key to understanding the vertical technique is the realization that it is a concept developed to achieve a safe reduction of breast volume, with aesthetically-pleasing, long-lasting results and a minimal postoperative scar. To
achieve these goals, I rejected any skin and gland undermining, instead reducing the size of the breast through a central vertical wedge resection. This type of resection permitted compression of the inferior pole of the breast, which is the key to obtaining conical-projecting breasts with a full upper pole. The vertical scar is the result of the implementation of this concept, rather than the goal of the technique.

The reception given to the vertical mammaplasty technique has evolved over the years. I recall presenting at the Third Annual Plastic Surgery Breast Symposium in Santa Fe in 1988, after which Dr. John McKissock said, “It is magic, but the inverted-T scar is no problem.” Dr. Thomas Biggs responded, “We Americans should pay attention to the European vision of Dr. Lassus.” It appears to me that the influence of the vertical scar mammaplasty technique increased significantly after Dr. Lejour described and popularized her vertical technique in 1990. Since then, many variations of this technique have been published, including the Hammond technique, the Hall-Findlay technique, the Graf and Biggs technique, and the Mottura technique, among others. Although they utilize different principles, all finish with a vertical scar. As this review indicates, my technique has evolved over time, but it is still my belief that the principles embodied in my concept of vertical mammaplasty are key to safely achieving projecting breasts with a full upper pole.

CONCLUSIONS

My vertical scar technique evolved over a series of 2000 patients and 42 years of experience. The technique provides a means for safe reduction of breast volume, with aesthetically-pleasing, long-lasting results and a minimal postoperative scar. It relies on a central vertical wedge resection, rather than skin and gland undermining, to reduce breast size.
Figure 27. (A, C) This 22-year-old woman presented for correction of breast hypertrophy. (B, D) Twenty years after vertical scar mammoplasty with my technique.

Figure 28. Results are shown 40 years after vertical scar mammoplasty with my technique. No preoperative photographs are available for this patient, but note that the result has maintained conical projection and upper pole fullness over the long term. The patient was 80 years old at the time of these postoperative photos.
Disclosures
The author declared no potential conflicts of interest with respect to the research, authorship, and publication of this article.

Funding
The author received no financial support for the research, authorship, and publication of this article.

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SUGGESTED READING