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# B-Technique with dermis suspension: A new approach toward reduction mammaplasty combining short-scar with durability of results

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Received 15 September 2019; accepted 22 November 2019 Available online xxx

Journal of Plastic, Reconstructive & Aesthetic Surgery (2020) 000, 1-9

KEYWORDS Breast reduction; Mammaplasty; Breast	<ul> <li>Summary Background: Dermis suspensions (DM) have been introduced in reduction mammaplasties (RM) to extend the durability of the results and improve the quality of the scar. The authors present a new method of RM that consists of completing the B-method of Regnault with a well-vascularized DM.</li> <li>Objective: Analyze the efficacy of a reduction mammaplasty technique proposed by the authors.</li> <li>Methods: The authors propose a comparison of two mamma reduction techniques based on a superior pedicle performed on 233 patients at the Medical University of Vienna, Department of Obstetrics and Gynecology, from 2010 to 2019. A total of 102 patients (Group A) were treated with a mammaplasty using Regnault's B-technique with a superior pedicle; 131 patients (Group B) were treated through a similar technique with additional support from an inferior-based deepithelialized pedicle for extra support. The assessment of patient satisfaction was performed using a Patient and Observer Scar Assessment Scale (POSAS).</li> <li>Results: Group A/Group B: 74/97 patients were operated bilaterally and 28/24 unilaterally. The amount of resected tissue ranged from 102-620 g to 30-810 g. Average BREAST-Q score for satisfaction with outcome was 82.3/86.1. POSAS was scored 35.2/37.6 to 23.2/24.4.</li> <li>Bottoming out after surgery was observed in 12 of 102 patients in Group A and 6 of 131 in Group B in the follow-up visits at 12, 18, and 36 months.</li> </ul>

The work has not been presented yet, neither wholly or in part.

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https://doi.org/10.1016/j.bjps.2019.11.045

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*Conclusion*: The described technique proved to be fast, safe, and reliable, with a high level of patient satisfaction, less bottoming out, and better scar quality.

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### Introduction

Available literature yields over 100 publications describing several differing techniques for reduction mammaplasty. For years, our department has been performing the Btechnique from Regnault to reduce breasts.<sup>1</sup> We have performed this technique for nearly 3 decades as it produces very few complications, leaves behind a short and wellhidden scar - completely sparing the medial aspect of the submammary fold - and can be accomplished within twoand-a-half hours in experienced hands.

Because the B-technique utilizes a superior pedicle, it also facilitates complete mobilization of the breast parenchyma, thereby enabling excellent shaping of the breast and even changing of the breast's position if required. Nevertheless, the successful introduction of dermis suspension techniques<sup>2,3,4,5,6,7</sup> incited us to find a way to combine the advantages of the B-technique with the benefits represented by an internal brassiere, which should contribute to the enhanced durability of the results and prevention of bottoming out, as well as improved scar quality because of the assumed reduction of tension to the skin. Being well aware of the Hinderer's statement, which questions, in Exner's publication, the possible effect of DM in regard to their insufficient blood supply,<sup>3</sup> we focused our efforts on finding a way to form an internal brassiere that is very well supplied with blood.

#### Methods

#### Study population and duration

From January 2010 to June 2019, 233 women with a body mass index of 23.6 in Group A and 22.5 in Group B were involved in this prospective study. The age of the patients

ranged from 19 to 66 years (mean: 39.6). Exclusion criteria included using steroids or other immune modulators known to negatively affect wound healing, pregnancy or lactation, history of radiation of the breast, tattoos in the area of the incision, and a known history of hypertrophic scarring or keloids. Of these patients, 131 (group B) signed an additional informed consent form describing the implementation of a dermis suspension as an extension of a previously used technique. Follow-up time ranged from 8 to 38 months (mean: 18 months).

#### Patient markings

The basic markings are similar to those described by Regnault in 1974.<sup>1</sup> Subsequently, an area of 7-9 cm in length and 3-5 cm in width is drawn below the caudal margin of the future nipple areola complex (NAC) (Figure 1).

#### Surgical method

Surgery begins with deepithelialization of the skin excess around the areola and the dermis suspension below it (Figure 2). Next, resection of the parenchyma is performed along the edges of the two lateral flaps of the breast, along the submammary fold and around the dermis suspension (Figure 3). Subsequently, the remaining breast is mobilized from the pectoralis major fascia, a procedure similar to the B-technique<sup>1</sup>. If necessary, additional parenchyma removal can now be performed by resecting tissue from the base of the breast at any desired localization.

After parenchyma resection, the caudal edge of the dermis suspension is sutured to the pectoralis major fascia with 3.0 nonresorbable thread (a key point in the operation) (Figure 4). Finally, the lateral and the medial flaps are brought together and unified as in the original B-technique.



Figure 1 Patient markings. Dermis suspension: 7-9 cm in length and 3-5 cm width.





Figure 2 Deepithelialization of the skin excess around the areola and the dermis suspension below it.



Figure 3 Removal of breast parenchyma of the caudal edge.



Figure 4 Fixation suture of the caudal edge of the dermis suspension to the pectoral muscle.

To facilitate skin closure, a flap 1 cm thick is used, leaving the breast parenchyma under the two lateral parenchyma flaps on both sides of the dermis suspension and allowing the upper section to "glide" over the dermis suspension to meet its medial counterpart (Figure 5). Following that, the shape of the breast is verified in an upright position and corrections made if necessary. The NAC is sutured to the surrounding skin with a purse-string suture using a nonresorbable 3.0 thread, to avoid postoperative widening of the areola.

#### Scar assessment

In this study, scar quality assessment was performed using a Patient and Observer Scar Assessment Scale (POSAS). This is a comprehensive scale designed for the evaluation of scar quality by professionals (observer scale) and by patients (patient scale) consisting of two numeric scales with six items scored from 1 to 10 (with 10 indicating the worst imaginable scar or sensation and 1 corresponding to normal scar or skin): the Patient Scar Assessment Scale items com-



Figure 5 Coverage of the dermis suspension.





prise pain, itching, color, stiffness, thickness, and irregularity, and the Observer Scar Assessment Scale items consist of vascularization, pigmentation, thickness, relief, and pliability. The total score of both scales was calculated by summing up the scores of each of the six items and ranges from 6 to 60 (Table 1).

### Patient satisfaction

Assessment of patient satisfaction was performed using the BREAST-Q for breast reduction, with scores ranging from 0 to 100 (higher scores meaning greater satisfaction, or better quality of life [QOL]). BREAST-Q scores were tabulated for all satisfaction and QOL (or well-being) scales were assessed by the postoperative reduction mammaplasty questionnaire module. Satisfaction scales assessed patients' postoperative satisfaction with their breasts, overall outcome, nipples, information (about risks, healing, recovery time, and details of procedure), plastic surgeon, medical staff, and office staff. QOL (or well-being) scales assessed patients' postoperative psychosocial, sexual, and physical well-being (Table 2).

## Complications

Complications were documented in both groups differentiating between minor and major complications. Seroma, delayed wound healing, minor wound infection, and bottoming were declared as minor complications. Hematoma that causes revision, necrosis of the NAC, and asymmetry were declared as major complications (Table 3).

## Results

Group A: Seventy-four patients were operated bilaterally, 28 patients unilaterally. The amount of resected tissue ranged from 102 to 620g (mean: 323g); POSAS Patient scale: 35.2 POSAS Observer scale: 37.6; BREAST-Q scales were as follows: satisfaction with breast (46.6), satisfaction with outcome (82.2), satisfaction with nipples (84.3), satisfaction with information (88.7), satisfaction with surgeon (93.1), satisfaction with medical staff (87.8), satisfaction with office staff (86.6), psychosocial well-being (81.0), sexual well-being (81.2), and physical well-being (82.3).

Overall, 3 cases presented moderate seroma; bottoming out was seen in 12 patients; delayed wound healing was seen in 7 patients and was treated with topical agents; and revision surgery was necessary in 4 patients because of minor dog ears, 5, 7, 12, and 13 months after initial surgery.

Group B: 97 patients were operated bilaterally, 24 patients unilaterally. The amount of resected breast tissue ranged from 30 to 810g (mean: 303.9g); POSAS Patient scale: 23.2 POSAS Observer scale: 24.4; BREAST-Q scales were as follows: satisfaction with breast (43.6), satisfaction with outcome (86.1), satisfaction with nipples (87.1), sat-

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isfaction with information (90.3), satisfaction with surgeon (92.7), satisfaction with medical staff (86.9), satisfaction with office staff (86.9), psychosocial well-being (85.9), sexual well-being (86.0) and physical well-being (86.1).

Four cases presented with moderate seroma, bottoming out was seen in 6 patients, delayed wound healing was seen in 5 patients and also treated with topical agents, revision surgery was necessary in 3 patients because of minor asymmetry, and on patients' request 4, 6, and 10 months after surgery, respectively.

No major complications occurred in either group. No partial areola necrosis or loss of NAC was observed. No hematomas or wound infections occurred. Rupture of the purse-string suture never occurred.

### Discussion

The use of a dermis suspension during reduction mammaplasty is intended to extend the durability of the intervention's result and enhance the quality of the scar<sup>6,8</sup>. The purpose of the dermis suspension is to prevent bot-

toming out of the breast parenchyma. Moreover, tension is taken off of the skin flaps and their suture lines, because the breast parenchyma is supported by the dermis suspension rather than by the skin<sup>3</sup>. Hinderer was likely the first to use this technique in 1969<sup>9</sup>, followed by Eren (1989)<sup>10</sup>, Frey (1999)<sup>2</sup>, Würinger (1999)<sup>11</sup>, Exner (2002)<sup>3</sup>, Menderes (2005)<sup>6</sup>, De la Plaza (2004)<sup>8</sup>, and Brongo (2005)<sup>7</sup>.

Even though the location and method of parenchyma resection used in our procedure is not as simple as that in the B-technique (Figure 3), we reached nearly identical operating times (to the B-technique) toward the end of the study.

However, all the abovementioned techniques differ regarding the design of the dermis suspension, the pedicle, and the shape of the scar (Table 4). One publication<sup>7</sup> deserves particular attention, as it demonstrates a statistically significant reduction of postoperative ptosis, and justifies the additional burden of extended surgery by offering increased benefit for the patient. In our approach, we succeeded in combining the innovation of the internal brassiere with the main characteristics of Regnault's technique - namely the upper pedicle, the type of scar, and, above all, the ability to influence the shape of the breast



Figure 6 Skin closure.



Figure 7 Pre- and postoperative.



Figure 8 Pre- and postoperative.

with the skin flaps, as the breast parenchyma remains completely attached to it (Figures 6-10).

In this discussion, we compare different techniques that utilize a dermis suspension and have thus divided it into six main categories of consideration: characteristics of the pedicle, shape of the breast/bottoming out, blood supply of the NAC - safety, characteristics of the parenchymal resection, shape of the scar, and blood supply of the dermis.

#### Characteristics of the pedicle

Four authors (including our trial) are currently using a superior pedicle<sup>3,8,</sup> and <sup>9</sup>; 3 are using a central pedicle<sup>2,10,11</sup>, 1 an inferior pedicle<sup>6</sup>, and 1 a combined medial and central

pedicle<sup>7</sup>. The choice of pedicle has several impacts; we will discuss 4 of these, which we regard to be of special importance: the shape of the breast/bottoming out, the blood supply of the NAC, the sensibility of the NAC, and the characteristics of parenchyma resection. We purposely include, in this discussion, techniques that do not use a dermis suspension, because we regard this basic debate (dermis suspension versus no dermis suspension) as essential for the decision regarding which technique should be implemented.

#### Shape of the breast/bottoming out

Techniques using the superior pedicle allow for excellent mobilization and shaping of the breast, because the



Figure 9 Pre- and postoperative.



**Figure 10** Pre- and postoperative.

parenchyma remains attached to the skin. This allows for both positioning and shaping of the breast by suturing the base of the breast in any desired position, and by shaping the skin flaps<sup>9</sup>. Both maneuvers can hardly be performed with a central pedicle, as<sup>1</sup> the position of the breast's base is immobile, and<sup>2</sup> shaping possibilities are limited: tightening of the skin flaps causes a flattening of the breast parenchyma, as it is forced to glide away under them, resulting in flat, rather than nicely projected breasts. This inconvenience might be partly avoided by placing several stabilizing sutures around and within the central pedicle, somehow forming a parenchymal pillar that better retains the desired projection. This maneuver, however, only partly avoids flattening of the breast, if the skin flaps become tightened. Techniques using a lower pedicle enable good shaping of the breast, as large parts of the parenchyma remain attached to the skin. However, a change in the breast's position is not possible, as it remains attached to the chest. Regarding long-term results, techniques using the lower pedicle show a higher probability of bottoming out of the lower breast and hollowing out of the upper breast, thereby compromising the aesthetic result. This opinion is also shared by Exner<sup>3</sup>.

Consequently, it is our belief that the technique of reduction mammaplasty has to be chosen according to the characteristics of the breast to be operated upon. If there is a distinct sagging of the upper pole together with the NAC, a technique should be used that "redresses" rather than repositions it. In such cases, a central or lower pedicle seems convenient. In contrast, breasts that exhibit bottoming out might be better corrected with a technique that utilizes an upper pedicle, if the shape of the breast is paramount.

### Blood supply of the NAC - safety

Any technique that preserves a large buffer of dermis around the NAC will ensure a good blood supply because of the rich vascular plexuses remaining within the dermis. Similarly, techniques that retain a large part of the parenchyma attached to the skin also provide a good blood supply to the NAC, especially if this attachment belongs to the lateral pole of the breast-skin envelope9. In contrast, techniques that have a central pedicle restrict the blood supply from the intercostal vessels to the emerging arteries. This blood supply is certainly rich in the base of the parenchyma, but experiences a sharp reduction in the distal parenchyma based on the size and length of the operated breast's conus. We noted a number of NAC necroses following the use of the Eren technique<sup>10</sup> in very large breasts, and fewer after having performed the Frey technique.<sup>2</sup> This complication never occurred subsequent to the techniques we previously used for very large<sup>12,13</sup> and medium-sized<sup>1</sup> breasts. Therefore, we are of the opinion that, regarding the blood supply and ensuring survival of the NAC, utilizing a central pedicle is not a good decision, especially for large or very large breasts. This opinion was expressed by Wise in 1956,<sup>14</sup> who

**Table 4** This table lists 9 published techniques of reduction mammoplasty, all of which demonstrate the implementation of a dermis suspension. The table compares the shape of the scar, the type of the pedicle of the NAC, and the quality of blood supply form the dermis suspension. Asterisks mark dermis suspensions, which must be considered to be free dermis flaps - they were not attached to the breast parenchyma, and their dermal attachments were either small, or so narrow that we classified them as free flaps.

	Shape of the scar	Pedicle of NAC	Blood supply of the dermis suspension
Hinderer 1976	inverted T	superior	free flap*
Eren 1989	inverted T	central	well pedicled
Frey 1999	B (Regnault)	central	well pedicled
Exner 2002	vertical	superior	free flap*
Menderes 2005	inverted T	inferior	well pedicled
De la Plaza	inverted T	superior/medial	criss-cross, free flap*
Brongo 2005	inverted T	medial/central	criss-cross, free flap*
Turkof 2009	B (Regnault)	superior	well pedicled

stated that "...[a] technique using the central pedicle shows a higher risk of necrosis for the NAC." Moreover, one of the pioneers of reduction mammaplasty, McKissock,<sup>12</sup> made the following comment in 1985, during a discussion of Hester's publication<sup>15</sup> concerning his centrally pedicled technique: "...[W]hat was found, however, was that the skin undermining partially devascularized the parenchyma and then what was viewed as a conservative tangential resection too often completed the job. It ignores, as did most breast reduction procedures prior to 1960, the vascular contribution of the skin to underlying parenchyma.

The introduction of the Strombeck technique in 1960<sup>13</sup> launched an area in which wide circumferential skin undermining was condemned as needlessly risky and obsolete... [W]ide breast skin undermining and extensive glandular resections form a risky partnership".<sup>13</sup>

Other authors also favor techniques that avoid wide undermining of the skin.<sup>16,17</sup> It is our opinion, therefore, that all techniques using a central pedicle should be implemented with caution, especially in very large breasts.

### Sensibility of the NAC

Regarding the sensibility of the NAC, any technique that preserves the course of the fourth and fifth intercostal nerve has to be regarded as safer than techniques that risk transecting these nerve branches. Some publications claim that the sensibility of the NAC is best preserved by techniques using a central or lower pedicle.<sup>2,11</sup> On the other hand, other authors claim that techniques using a superior or superior-medial pedicle provide the best vascularization of the breast parenchyma, together with an excellent rate of sensibility return to the NAC.<sup>8</sup> Similarly, Hamdi stated in his trial that there is no significant difference in the NAC's sensibility when using techniques that employ a superior pedicle compared with inferior pedicle techniques.<sup>18</sup> Even though few publications<sup>18,19</sup> question the importance of preserving the fourth and fifth intercostal nerves, it is our opinion that, in regard to NAC sensibility, a central pedicle technique exhibits the highest level of security, as this method certainly poses the lowest risk of causing damage to these nerves.

### Characteristics of the parenchymal resection

Techniques utilizing a central pedicle tend to involve relatively long dissection times as first the skin envelope must be completely detached from the central cone, and then the parenchyma resections occur layer by layer, circularly around the remaining cone - resulting in relatively high blood loss. In contrast, techniques using superior pedicles allow for faster parenchyma resection<sup>20</sup> and reduced blood loss, as the "multi-layer" dissection is nonexistent in these cases. Even though the amount of blood loss will remain limited in experienced hands with any technique, this aspect deserves attention. The procedure described in this paper essentially allows the surgeon to resect the desired amount of breast tissue simply and safely, resulting in a short operative time and minimal loss of blood.

### Shape of the scar

The scar resulting from reduction mammaplasty has always been a concern for patients. We, therefore, wanted to compare the scars resulting from the other techniques that also use a dermis suspension.

Five authors used a technique that resulted in a scar resembling an inverted "T," 2 authors (including our trial) used a technique that resulted in a scar resembling a "B," 1 author's chosen technique resulted in a scar resembling an "L," and 1 author's chosen technique resulted in a vertical scar (Table 4). Even though we are of the opinion that the length of the scar should not be a higher priority than the shape of the breast, one should try to keep it as short as possible, provided the shape of the breast is not compromised. Compared to the other techniques mentioned<sup>6,7,8-10</sup>, our method leaves a scar that is most often shorter, and can therefore be recommended, provided that the aesthetic results are satisfactory and comparable.

### Blood supply of the dermis

The dermis suspension is the key aspect of the operation. It is expected to hold the weight of the operated breast and is

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considered to be responsible for the reduction of postoperative sagging.

Within the pertinent literature, one author performed the dermis suspension as a free graft,<sup>9</sup> 4 with a very narrow pedicle rendering the dermis flap essentially a free flap<sup>3,7,8</sup>, and<sup>11</sup> and 4 (including our trial) performed well-vascularized pedicles<sup>2,6</sup>, and<sup>10</sup>. Hammond<sup>3</sup> strongly criticized the technique of Exner<sup>4</sup>, by which the dermis suspension is performed as a free dermis flap, and therefore, might not always (or may even never) survive.

Our personal observations in 2 early cases confirm Hammond's objections to a free dermis suspension: Prior to implementing the technique described in this article, we had performed 9 operations with a dermis suspension pedicled only at the caudal margin of the areola, and therefore implemented, in fact, a free dermis flap. Two patients out of this group were unsatisfied with their results, and we performed a revision at 11 and 13 months, respectively, after the initial operation. In both revisions, the dermis suspension could no longer be identified. These findings led us to change the initial technique, and we developed the presently described technique to include a well-pedicled, and therefore, vascularized, dermis suspension. In addition, in this new group of patients (using the presently described technique), 4 out of 131 cases had to undergo reoperation after the initial intervention. As all showed their respective DM to be perfectly in situ and well vascularized, the validity of a well-pedicled dermis suspension was confirmed

Consequently, all techniques missing a well-vascularized dermis suspension<sup>3,7,8,9,11</sup> (Table 4) have to be questioned regarding the efficacy of their approach, as a dermis suspension without adequate blood supply will almost certainly disintegrate, and thus lose its supportive function.

### Conclusion

The presented technique - which consists of completing the B-technique with a well-vascularized dermis suspension - proved to be an effective and safe procedure, leading to high patient satisfaction.

### **Declaration of Competing Interest**

None declared.

### Funding

None.

### Ethical approval

Not required.

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