The Paisley Pattern Breast Reduction

La réduction mammaire par patron de Paisley

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Abstract

Background: Skin resection patterns inform the shape and scars after breast reduction. The 2 most commonly performed skin resection patterns, the Wise pattern and vertical pattern, each have limitations. The most common challenge is addressing excess lateral skin while avoiding medial scars. The Paisley Pattern breast reduction addresses this by incorporating lateral dogear excision in the skin resection design. **Methods:** Thirty consecutive patients received a Paisley Pattern breast reduction. After institutional review board approval, a chart review was performed to evaluate resection weight, operative time, American Society of Anesthesiologists class, flap necrosis, and seroma. **Results:** Operative times were comparable to published times for the Wise and vertical pattern techniques. No patients had lateral flap necrosis, and no patients required a return to the operating room during the follow-up period. One patient developed a unilateral seroma that was drained by interventional radiology. **Conclusions:** This report of a novel skin resection design demonstrates a proof of concept that the skin resection pattern can be performed safely in a wide variety of patients. Although there is a learning curve to the technique to prevent over-resection laterally, it provides efficient and aesthetically acceptable alternative to the Wise and vertical skin resection patterns for both large and small reductions.

Résumé

Historique : Les profils de résection cutanée présagent de la forme et des cicatrices après la réduction mammaire. Les deux principaux patrons de résection cutanée, le patron de Wise et le patron vertical, ont leurs limites. Le problème le plus courant consiste à corriger l'excès de peau latérale tout en évitant les cicatrices médiales. La réduction mammaire par patron de Paisley règle ce problème en intégrant l'excision latérale « en oreilles de chien » à la conception de la résection. **Méthodologie :** Trente patientes consécutives ont subi une réduction mammaire par patron de Paisley. Après l'approbation du comité d'éthique indépendant, les chercheurs ont procédé à une analyse des dossiers pour évaluer le poids de la résection, la durée de l'opération, la classification ASA, la nécrose du lambeau et le sérome. **Résultats :** La durée des opérations était comparable à celle publiée pour les techniques par patron de Wise et patron vertical. Aucune patiente n'a souffert de nécrose du lambeau latéral, et aucune n'a dû retourner en salle d'opération pendant la période de suivi. Une patiente a présenté un sérome unilatéral qui a été drainé par radiologie interventionnelle. **Conclusions :** Ce rapport d'une nouvelle conception de la résection cutanée valide la possibilité d'utiliser le nouveau patron de résection en toute sécurité chez toute une variété de patientes. Une courbe d'apprentissage s'impose avant de maîtriser la technique, afin d'éviter les surrésections latérales, mais cette méthode remplace de manière efficace et esthétique le patron de Wise et le patron vertical, tant pour les réductions importantes que mineures.

Keywords

breast reduction, reduction mammoplasty, macromastia

Introduction

Although the vertical technique for reduction mammoplasty has increased in popularity, an overwhelming majority of surgeons (83%) continue to use a Wise pattern skin resection.¹ The advantage of the vertical technique over a Wise pattern resection is avoidance of an “unsightly” scar and “boxy” appearance.² Descriptions of the vertical technique note that it is often less useful for larger breast reductions.²

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Figure 1. Preoperative patients. This technique can be used on a wide variety of patient who have lateral excess.

The paisley pattern breast reduction incorporates the advantages of vertical resection, including projection and natural shape, while allowing for shaping and draping the skin laterally to allow a smooth contour and avoidance of lateral dogears. Because the pattern is part of the original design, operative time spent excising lateral dogears is eliminated. This technique also avoids a medial scar and can be used for both large and small breast reductions.

Materials and Methods

Candidates for this technique met general criteria for breast reduction (Figure 1). Preoperative workup included routine, guideline-based preanesthesia testing, and mammography performed using the guidelines preferred by the patient's primary care provider. If preoperative mammography was performed, a Breast Imaging Reporting and Data System (BI-RADS) category 1 or 2 read was considered necessary to proceed with elective reduction; we defer performing breast reductions on patients with category 3 mammograms until the benign status of the findings is confirmed either radiographically or pathologically.

After institutional review board approval, a retrospective chart review was performed. All patients who had Current Procedural Terminology (CPT) code 19318 (reduction mammoplasty) by the author at a single health system from January 1, 2017 to December 31, 2017 were identified, and 30 consecutive patients who had undergone a paisley pattern breast reduction were chosen from a random time point. The technique was verified by operative notes. Charts were then reviewed for patient demographics including age, body mass index (BMI), and American Society of Anesthesiologists classification. Operative and outcome information was recorded including laterality of reduction, operative time, weight of specimen, number of postoperative appointments and timing, postoperative flap necrosis, seroma/hematoma, wound dehiscence, nipple loss, and return to operating room.

The surgical technique is described below.

Surgical Technique

The patient is marked in the standing position in the holding area. The patient's arms are held at the sides, and any lower body coverings are tied such that the patient does not need to hold them during marking. The shoulders are checked to ensure that there is no slouching or asymmetric shoulder positioning.

A midline marking is made, and the sternal notch is marked. The breast meridian is marked bilaterally on the breast and onto the abdomen. The inframammary fold (IMF) is marked bilaterally. The new nipple position is set and marked with a single point. The nipple position is set slightly lower than a transposed line of the IMF on the visible breast surface at approximately the mid- to low-humerus level. The arm provides an auxiliary reference point; while it is imprecise and should not be used as a primary landmark, it can be useful to visually confirm placement. A mosque pattern is then designed around the new nipple position. The breast is then rotated laterally to determine the medial marking. As the breast is held in the rotated position, a mark is made that connects the superior and inferior visible meridian markings. This line is then connected to the mosque pattern, and this marking is very similar to a vertical pattern reduction. The breast is then rotated medially and the lateral skin marking is made in a similar fashion. At the midpoint of the lateral markings, a "paisley" shape is extended laterally (Figure 2). The inflection point is made at the junction of the breast and axillary tissue. This inflection point helps avoid dogears, provides a smooth contour of scar, and allows the scar to be hidden within the bra line (Figure 3).

The pedicle is then designed. The cases presented used a superomedial pedicle, although—as with all breast reductions—any reliable pedicle can be used. Intraoperatively, routine surgical site preparation is performed, and perioperative antibiotics administration and deep venous thrombosis prophylaxis is performed according to guidelines. The nipple areolar complex is scored after measuring and marking with a Freeman cookie cutter. The pedicle is de-epithelialized often after a laparotomy pad is secured around the base of the breast to

Figure 2. Examples of preoperative markings. a,b, and c represent a single patient and note that the left shoulder is held higher in the picture than the right. This is corrected during marking to prevent exacerbation of nipple areolar complex (NAC) asymmetry. d shows a patient with more significant lateral excess, but note the markings do not need to go to the lateral chest wall. e shows the markings for a patient who will have a free nipple graft; the pedicle has been marked.

Figure 3. Arrows point to areas that must be checked for ease of closure. Over-resection of this area can lead to contour deformities.

provide tension. The skin markings are scored after confirming that the skin can be closed. The breast reduction then proceeds with resection of the breast parenchyma, rotation of the pedicle into position, placing pillar sutures, and closing the incisions in layers using absorbable suture. Drains are not used.

Results

Thirty consecutive patients over a 32-week period underwent the paisley pattern breast reduction. Representative results are shown in Figure 4. Of those, 4 underwent unilateral reduction for matching procedures after oncological reconstruction on the contralateral side, and 26 underwent bilateral reduction for symptomatic macromastia. Average age at time of surgery was 43 (range: 19-71). Average BMI was 34.8 (standard deviation

Figure 4. Postoperative result of Figures 1B and 2E. The scars have not yet fully matured.

Table 1. Patient Characteristics.

Average Age	Average BMI	ASA Class	Average Specimen Weight, Right	Average Specimen Weight, Left	Average Operative Time (Excludes Combined Cases, n = 3)
43 (range: 19-71)	34.8, (SD: 6.2, range: 25.7-51.8)	1: 14%, n = 6 2: 37%, n = 11 3: 43%, n = 13	662.5 g, SD: 386.6, range: 85.2-1680	708.1 g, SD: 448.6 g range: 89.5-2000 g	118 minutes, SD: 18 minutes, range: 84-151

Abbreviations: ASA, American Society of Anesthesiologists; BMI, body mass index; SD, standard deviation.

[SD], 6.2, range: 25.7-51.8). Of the 30 cases, 4 cases were combined with other procedures (1 fat grafting of breast reconstruction, 1 panniculectomy, 1 revision of reconstructed breast, and 1 hernia repair and panniculectomy). The average operative time, excluding combined cases, was 118 minutes (SD: 18 minutes, range: 84-151). One specimen had no recorded weights; average specimen weights of the remaining 29 specimens were right: 662.5 g, SD: 386.6, range: 85.2-1680; left: 708.1 g, SD: 448.6 g range: 89.5-2000 g (Table 1). One patient had free nipple grafts as part of the planned reduction.

All procedures were performed as outpatient surgeries; one patient was admitted as an observation patient who had combined procedures including breast reduction, panniculectomy, and hernia repair. All patients received perioperative antibiotics.

One patient developed a postoperative seroma drained by interventional radiology. There were no cases of flap necrosis, nipple loss, or return to the operating room within 30 days. There were no recorded wound dehiscences from tension. One patient had a unilateral contour deformity that was likely related to over-resection of the skin in the superolateral aspect.

Discussion

A breast reduction must take into account the skin envelope, the amount and density of breast parenchyma, and the breast footprint.

This study provides proof of concept for a skin resection design that obviates the challenges of a vertical resection pattern and a Wise pattern resection. To be sure, the published literature on breast reduction documents skin resection patterns that avoid medial scars. Meyer and Kesserling described an L-shaped suture line in 1975³; the authors note that in some cases, they perform a 2-stage operation. Regnault described his "B" technique in 1980 and noted that in this technique the lateral resection is performed at the end of the resection and is best performed on reductions of <1500 cm.^{3,4} Over time the vertical incision gained popularity, but limitations were noted with higher resection rates, and Pallua and Ermisch proposed modifying the vertical incision to an "L."⁵ Despite the literature, in a 2002 paper evaluating preferences for breast reduction techniques, a plurality of the respondents reported using inferior pedicles/Wise pattern techniques.⁶

A prospective randomized study comparing a medial pedicle with a vertical resection pattern to an inferior pedicle with a Wise resection pattern found that while rates of infections,

seromas, hematomas, partial areolar necrosis, and wound dehiscence were similar between the 2 groups, the patients who underwent vertical mammoplasty requires more revisions of dogears. It is interesting to note that in this study, patients had average resection weights of 553 and 548 g and had BMIs of 26 ± 4 and 27 ± 5 .⁷ A retrospective review of patients matched for age and weight of resection (average: 815 [medial pedicle, vertical resection] and 840 g [inferior pedicle, Wise pattern]) who underwent medial pedicle with a vertical resection pattern or an inferior pedicle with a Wise resection pattern found no difference in complication rates. There was a 2% return to the operating room for the medial pedicle/vertical technique and no reported return to the operating room in the inferior pedicle group, although this was not found to be statistically significant.⁸ This study did not have any patients return to the operating room but was not powered for that. The average resection weights were higher in this study than in the prospective randomized trial comparing medial pedicle/vertical resection with inferior pedicle/Wise pattern resection,⁷ but the average BMI of the patients in this study was higher. The abovementioned studies did not evaluate surgical times. The average surgical time of less than 2 hours using this technique suggests that it is safe to combine with other procedures.

As with the vertical technique,⁹ the nipple areolar complex should be positioned lower than traditionally used in a Wise pattern reduction because of the postoperative projection. Lateral extensions have been described, most notably in the Boomerang Pattern correction of gynecomastia,¹⁰ but this technique is distinct in that it addresses a different issue, namely, that it removes excess lateral skin and subcutaneous tissue in a breast reduction without the intent of addressing skin excess of the axilla and lateral chest wall as in massive weight loss. It is different from the L-shaped reduction patterns³⁻⁵ in that the design is determined preoperatively rather than intraoperatively, and the pattern helps to accommodate lateral fullness.

Because this modification is to the skin resection and not to the pedicle itself, the biggest risk is over-resection of tissue, wound dehiscence from tension, and flap necrosis. This study did not find any patients who had wound dehiscence from tension. There is a learning curve to the technique, and it is important to check to make sure the incisions can be closed without tension. Over-resection of the lateral aspect of the Paisley pattern can lead to an excess of skin and subcutaneous tissue medially relative to the skin and subcutaneous tissue laterally, which can lead to a step-off deformity.

Conclusions

The paisley pattern breast reduction provides a mechanism to eliminate lateral dogears while avoiding a medial scar. In the series presented, there was not an increased risk of flap necrosis or wound dehiscence.

Declaration of Conflicting Interests

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