

Four flap suspension technique for prevention of bottoming out after breast reduction

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Purpose: Bottoming-out deformity is accepted as the most important disadvantage of inferior pedicle breast reduction. For prevention of this deformity, different techniques are used in combination with inferior pedicle. In this study, we aimed to prevent bottoming-out deformity by producing an internal bra effect through combination of inferior pedicle technique with 2 superior and 2 inferior dermal flaps that were raised from each side of the pedicle.

Methods: Thirteen patients whose medical records became available during the follow-up period at Ankara Training and Research Hospital from January 2010 to January 2015 were included in this study. We retrospectively obtained patient medical records including demographic characteristics and clinical data. Superior dermal flaps were planned on both sides of the pedicle 2 cm inferior to the lower border of areola and inferior dermal flaps were planned 6 cm inferior to the superior dermal flaps. The superior and inferior dermal flaps were secured to the periosteum of the 2nd and 4th ribs respectively with permanent sutures.

Results: Preoperatively, the average distance between the inframammary fold and areola was 13.9 cm (range, 11–18 cm). The average amount of breast parenchymal resection was 745 g (range, 612–1,496 g). The average distance between the inframammary fold and the lower border of the areola was 7.9 cm (range, 7.5–9 cm) on the postoperative first-year measurements.

Conclusion: In conclusion, according to our study, suspension technique to prevent bottoming-out deformity is associated with an easier technique without the need for alloplastic or allogenic materials. Since fixation is performed to the ribs instead of soft tissues like the pectoral fascia or muscle, we believe that this fixation is more long lasting and can be an effective alternative to other suspension techniques.

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Key Words: Mammoplasty, Breast reduction, Flap, Suspension

INTRODUCTION

Besides physical problems like neck, back and shoulder pain, recurrent intertrigo at the undersurface of the breast and restriction of activities, social and psychological problems like increased attention to huge breasts are also quite annoying for women with excessively large breasts [1-3]. Since it eliminates these kinds of difficulties, breast reduction surgery is a procedure that can increase quality of life, and patient satisfaction has been reported at quite high levels from 86%–

95% [3-6].

Until recently, many breast reduction techniques have been defined and each of them has distinctive advantages and disadvantages [7-11].

Breast reduction technique with inferior pedicle, and its variations that were defined by Courtiss and Goldwyn and Georgiade, is still one of the most popular methods today [11-13]. Breast reduction with inferior pedicle is frequently preferred by many surgeons, especially for breasts with a need of very large reduction. Loss of upper pole fullness, flattened breast

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shape, pseudoptosis (bottoming out) and upwards rotation of nipple areola complex (star gazing deformity) are the most important disadvantages of the technique that occur due to a downward movement of the breast parenchyma inferolaterally and recurrent laxity of the skin envelope [11-14].

In order to protect breast shape and avoid pseudoptosis (bottoming out) in the long term, different suspension techniques combined with the inferior pedicle technique have been defined and successful results have been reported in the literature [15-18].

In this study, by combining the inferior pedicle breast reduction technique with 2 superior and 2 inferior flaps originating from the tissue that will be excised, whose bases were on the medial and lateral side of the original pedicle, a suspension technique was defined and aimed to protect the new breast shape for a longer period of time by preventing bottoming out

and flat appearance of the upper pole.

METHODS

Since January 2010, 25 patients had reduction mammoplasty with a combination of inverted T scar inferior pedicle technique and dermal flap suspension technique we defined, and 13 among them whose postoperative 1-year data could be obtained were included in the study. The average age of the patients was 41 years (range, 25–62 years) and the average body mass index was 30.8 kg/m² (range, 29.2–32.4 kg/m²). Digital photographs of all the patients were taken preoperatively, after markings, early on the 10th postoperative day and on the 1st, 3rd, 6th, 9th, and 12th postoperative months. Measurements of the patients were taken and recorded.

After preoperative photography, necessary measurements

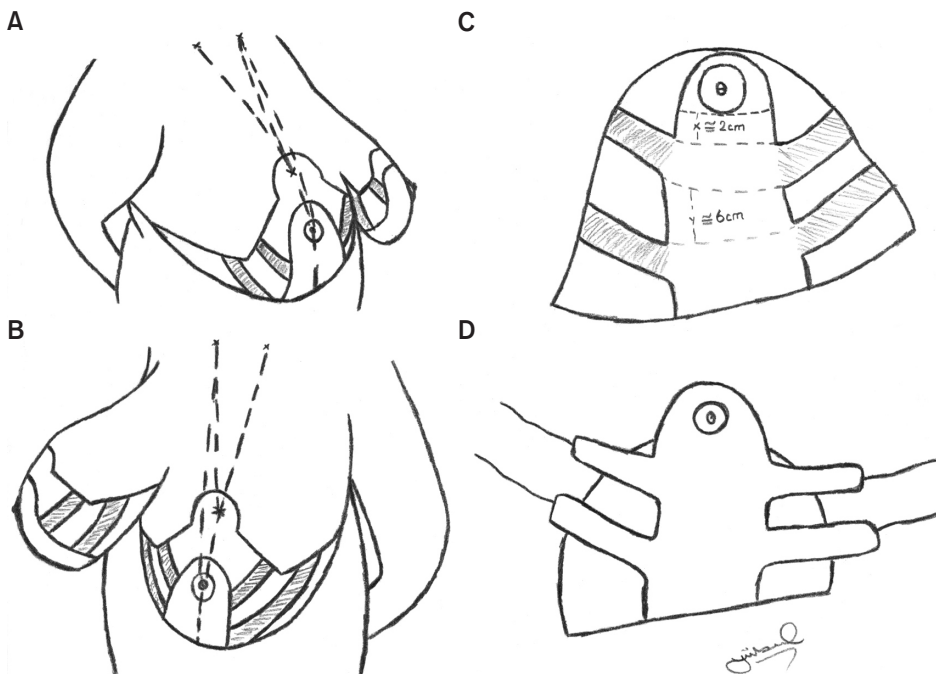


Fig. 1. (A, B) Preoperative schematic drawings of inverted T scar inferior pedicle technique combined with dermal suspension flaps. (C) Measurement and planning of dermal flaps on pedicle. (D) Elevation of inferior pedicle and dermal suspension flaps.

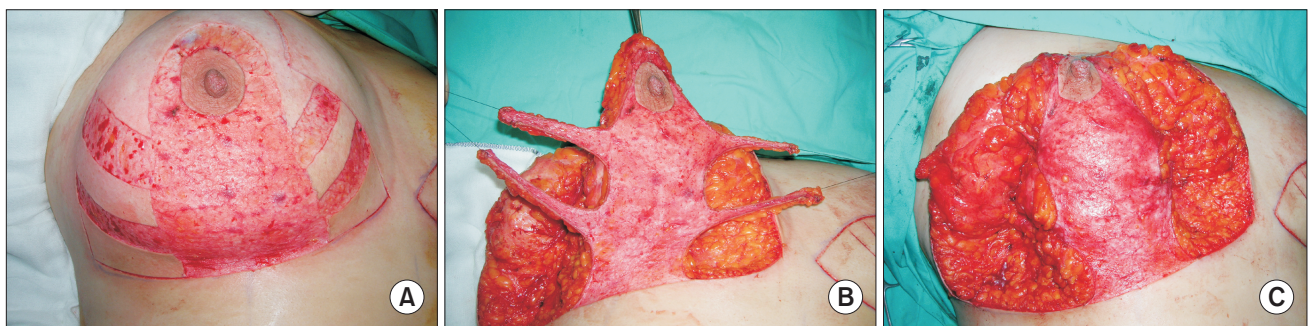


Fig. 2. (A) Intraoperative deepithelization of inferior pedicle and dermal suspension flap. (B) Elevation of dermal suspension flaps and inferior pedicle. (C) Fixation of dermal flaps to periosteum of 2nd and 4th costa.

and markings were performed in standing position. New nipple areola was marked on the midclavicular level by confirming the point by projection of the inframammary fold on the breast and midhumeral level. The distance in between the

sternoclavicular notch and new nipple areola was marked as 21–23 cm. Markings were performed freehand appropriate for the reverse T scar and vertical scar length was defined as 7 cm. Lateral and medial superior dermal flaps were designed

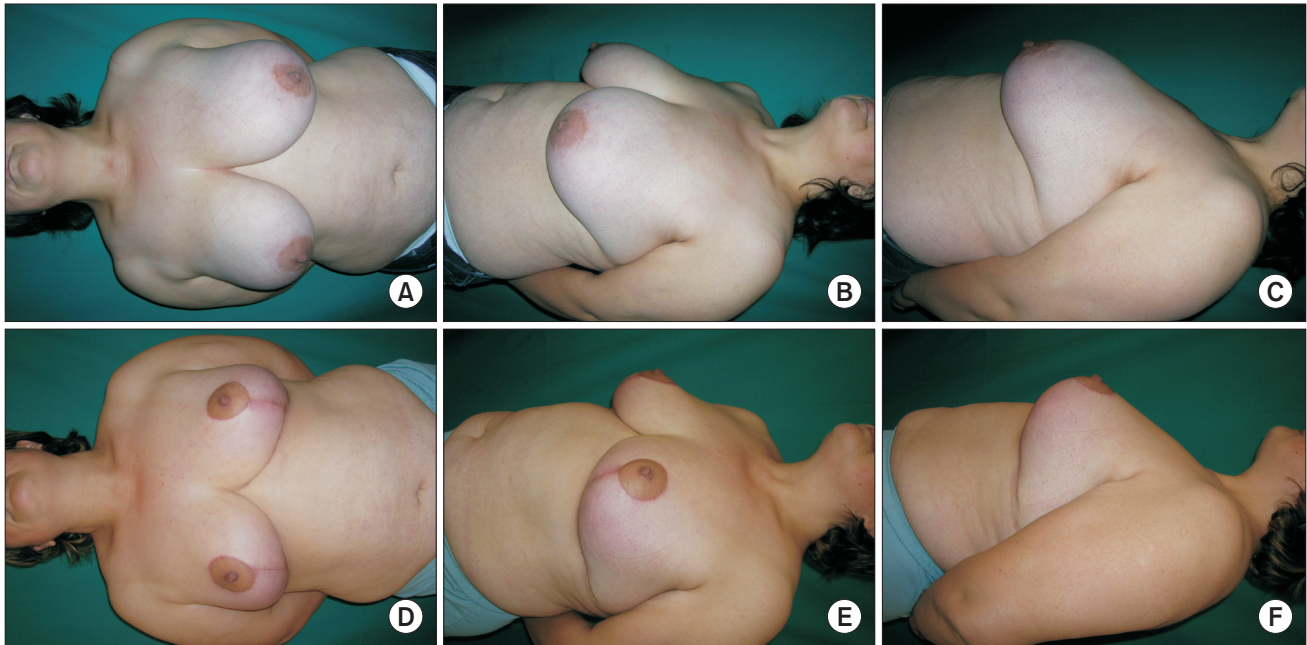


Fig. 3. Case 1: (A) preoperative anteroposterior view; (B) preoperative left oblique view; (C) preoperative left lateral view; (D) anteroposterior view at postoperative year 1; (E) left oblique view at postoperative year 1; (F) left lateral view at postoperative year 1.

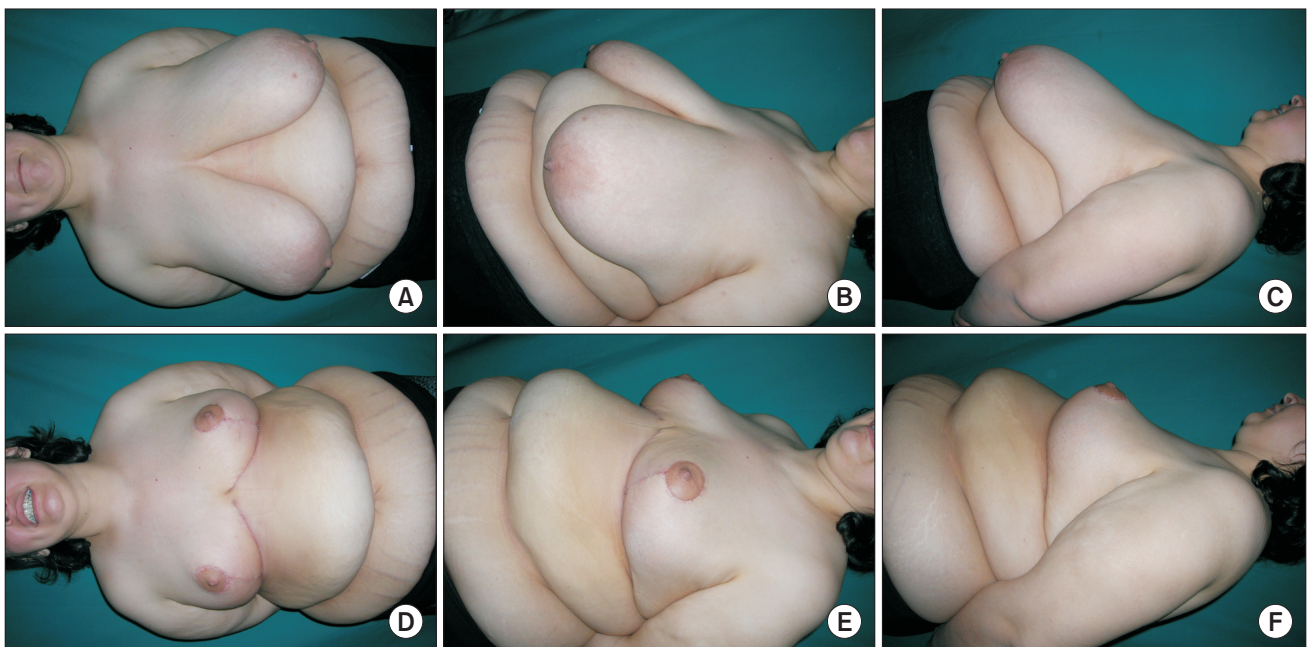


Fig. 4. Case 2: (A) preoperative anteroposterior view; (B) preoperative left oblique view; (C) preoperative left lateral view; (D) anteroposterior view at postoperative year 1; (E) left oblique view at postoperative year 1; (F) left lateral view at postoperative year 1.

with a width of 2 cm at a level of 2 cm inferior to the lower border of the areola extending to the level of incision of the parenchymal resection. Inferior dermal flaps were drawn with same dimensions at a level of 6 cm inferior to the superior dermal flaps. Sternoclavicular notch-nipple distance and areola lower-border inframammary fold distance were measured in all patients. The diameter of the new areola was determined as 4.5 cm. Preoperatively, average distances between sternoclavicular notch-nipple and inframammary-fold areola were 31.7 cm (range, 28–44 cm) and 13.9 cm (range, 11–18 cm), respectively.

Under general anesthesia, operation was started by de-epithelization of the pedicle and the planned dermal flaps. After de-epithelization, by including the dermal flaps, the pyramidal pedicle was prepared and then parenchymal breast resection was performed. Dermal flaps extending towards incision border of parenchymal resection with 2-cm width and 7- to 10-mm thickness were prepared without damaging the subdermal plexus. A hole created at the level of the 2nd rib parallel to the pectoral muscle fibers and superior dermal flaps were sutured to the costal periosteum with 2/0 prolene in a way that intact muscle bulk with 2-cm width would be present in between. On the same line, inferior dermal flaps were fixed to the 4th costal periosteum in a similar manner. Suction drains were placed on each breast and with appropriate skin closure according to the inverted T scar, operation was ended (Fig. 1, 2).

RESULTS

A retrospective analysis was performed with the data of 13 patients who reached postoperative year 1. The average amount of resection was 745 g (range, 612–1,496 g). At postoperative year 1, the average distances between sternoclavicular notch to nipple and inframammary fold to areola were 21.5 cm (range, 21–23 cm) and 7.9 cm (range, 7.5–9 cm), respectively. Partial necrosis developed on the superior side of the right areola in one patient. It was healed uneventfully with appropriate dressing and follow-up. This patient also defined sensory deficit on the areola. In one other patient, wound dehiscence developed at the junction of the T scar and healed well with daily dressing changes. Patients were satisfied with the esthetic results and felt physically comfortable with their preoperative symptoms such as back and shoulder pain reduced. Long-term follow-up of the patients is still going on (Fig. 3, 4).

DISCUSSION

Breast reduction surgery is a safe and reliable procedure with a high level of patient satisfaction [16]. In all the techniques defined for this surgery, the aim is to eliminate the physical and psychological problems of the patients and protect the new breast shape for a long period of time.

Inferior pedicle technique, which was defined in the mid 70s, is still one of the most popular breast reduction techniques used today [19]. In previous studies, necrosis of nipple/pedicle ratio, sensory loss on the nipple and lactation potential have been reported as 0.8%–6%, 1.3%–25%, and 68%–80%, respectively [4-7]. Good vascularity of the pedicle and protection of sensation of the nipple areola complex and lactiferous ducts make this technique safe even for the cases with a need of huge reduction amounts [11,17,19].

Besides these well-known advantages, there are disadvantages of the inferior pedicle technique, too. The most important disadvantages are risk of hypertrophic extensive scar, development of bottoming out and star gazing deformities, and inability to protect breast shape in the long term due to the loss of the fullness of the upper pole [8,14,20].

In this technique, it is accepted that breast volume is basically provided by the inferior pedicle and the skin envelope gives it its ultimate shape. Although successful results are achieved frequently in the early period, a few months postoperatively, due to skin envelope laxity and lateral and inferior migration of the pedicle, pseudoptosis (bottoming out) and upper pole flattening start to appear [11]. It is generally accepted that bottoming-out deformity starts to develop at approximately 6 months postoperative and detected clearly at the end of postoperative year 1. These deformities can be seen more as the amount of breast reduction increases [21,22].

These difficult-to-correct deformities are important problems and unacceptable for both plastic surgeons and patients. The application of vertical scar methods to decrease the resultant scar also helps in the prevention of bottoming-out deformity [9,10,23,24]. Although other breast reduction techniques with superior, medial, lateral, and superomedial pedicles assist to solve this problem, there are application difficulties for especially large volume breast reductions, and for these indications inferior pedicle technique is usually preferred [11].

In order to prevent the deformities seen with the inferior pedicle technique, many suspension techniques have been defined in the literature. Suspension of the pedicle with internal sutures, suspension with dermal flaps, fascia and muscle flaps, dermal strip and fascia lata, and suspension by providing internal bra effect with allogenic or alloplastic materials are examples of these techniques [3,15,16,23,25-29]. Especially, suspension methods performed with dermal flaps and strips are very popular [3].

Aydın et al. [15] have defined a suspension technique that provides an internal bra effect by fixing the triangular dermal flaps created on the pedicle edges to the pectoral fascia.

Widgerow [16] has described a suspension technique performed with superiorly based dermal fascial flaps prepared from the medial border of the inferior pedicle. In this technique, dermal fascial flaps with 5-cm length, 1- to 1.5-cm width and a

few mm thickness were created at least 2 cm inferior to areola in order to not distort the areola, and these flaps were secured to the pectoral fascia and muscle at the level of 4th and 5th costa. Besides this, the posterolateral edge of the pedicle was also sutured to the base at a similar level with medial dermal flaps. In this study with 25 patients, vertical scar length was planned not to be greater than 7 cm. At postoperative year 1, patients were divided into 3 groups according to the ratio of length of the vertical scar postoperatively to preoperatively as <1.25, 1.25–1.30, and >1.30. The cases with a ratio of >1.30 and vertical scar length >9 cm at postoperative year 1 were accepted as bottoming-out deformity. As a result, Widgerow [16] has declared a 92% success rate with this technique.

Pennington [17] has used a technique combining pedicle suspension and pedicle plication in order to prevent bottoming out deformity for more than 500 patients since 1985 and evaluated 200 of them retrospectively. In this technique, the pedicle was suspended in the midclavicular direction. The first line was drawn at 4.5–6 cm. inferior to the most inferior point of the areola and a second line was drawn in between the inframammary fold and the first line. Then plication with superficial sutures was performed between the fold and the first line and deep sutures were added from the second line to 2–4 cm upwards to the fold. In this study, it has been reported that revision surgery for pseudoptosis was not needed for any of the patients [17].

Perez-Macias [18] has combined inferior pedicle reduction mammoplasty technique with hammock technique that was defined in 1970s for suspension of the bladder. Between 1987 and 2005, this technique was performed for 623 women and 318 of them that occurred between 1994 and 2005 were evaluated retrospectively and successful results were reported.

In 1998, Echo et al. [3] combined inferior pedicle technique with horizontal dermal suspension and horizontal plication by using medial and lateral triangular dermal suspension flaps. After preparation of lateral and medial horizontal dermal flaps of 1-cm thickness with an intact subdermal plexus, they have fixed these flaps to pectoral fascia at the level of 2nd and 3rd costa 3 cm lateral to the sternal midline. They also made ellip-

tical plication between 3 cm below the areola and 3 cm above the inframammary fold and reported successful results with this technique, which was used for 66 patients.

Goes obtained good long-term esthetic results with a technique that creates internal bra effect by using polyglactine and polyester mesh [30]. Although this has been reported as safe for patients, the risk of infection and fibrosis and difficulty in imaging of a possible breast cancer remains as disadvantages of the technique. Due to these disadvantages, Brown et al. [11] used alloderm for the purpose of internal bra support in their study with 27 patients and declared successful results.

As a result, although many suspension techniques have been defined with successful results, prevention of the recurrent ptosis over a long period of time may not be possible all the time [23]. In this study, the aim was to create an internal bra effect with viable dermal flaps prepared from the breast tissue that would be excised during the operation. Inadequate number of patients and lack of long-term follow-up of the patients (more than 1 year) are the disadvantages of our study. But besides these disadvantages, we believe that fixation of the flaps to the costal periosteum instead of the pectoral fascia or muscle is an important advantage that can decrease the risk of recurrence in the long term. Also, suspension with a pair of flaps is more effective and no of need for pedicle plication due to the planned area of the inferior dermal flaps is another advantage of this technique. Since alloplastic and allogenic materials are not used, this technique becomes cost effective and also disadvantages like risk of infection, palpation and prevention of the imaging of possible breast cancer disappears. Besides these advantages, this technique is easy to perform, easy to teach and learn, and also does not increase the operation time nor the amount of hemorrhage and risk of possible complications. For all these reasons, we believe that this technique can be an effective alternative method for breast suspension.

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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