deeper spaces, alternating each plane for odd- or even-numbered clock-face hours. The upper half is best for the deepest muscular and submuscular planes because the configuration of the ribs makes it less likely to enter the chest when driving the cannula caudally (Fig. 7.11).

Intraoperatively, we insert a catheter in the recipient site and connect it to a pressure transducer to monitor IFP during grafting. According to our theoretical calculations and clinical experience, grafting should be stopped when IFP reaches 8–9 mmHg.[4]

POSTOPERATIVE SUPPORT

In our clinical experience, postoperative splinting and support improves fat graft survival and deformity correction. Immobilizing and maintaining open the graft-expanded space is important for many reasons:

1. Immobilization is necessary for graft revascularization.
2. After releasing a contracture and grafting the defect, to prevent recurrence, it is imperative to preserve the expanded space in an open state by splinting it in extension until the graft matures.
3. Tension encourages cell growth, even in a Petri dish.[11]
4. Splinting maintains a water-rich proteinaceous matrix, which induces adipogenesis.

REVERSE ABDOMINOPLASTY AND FAT TRANSFER

To salvage secondary cases with poorly defined mammary folds, capsular contractures, and a less-than-ideal shape, we use the reverse abdominoplasty and fat transfer (RAFT). This can recruit a crescent of upper abdominal and lateral thoracic tissue into the breast to increase autologous tissue volume, improve the cutaneous envelope for a more natural shape, and define new inframammary and lateral mammary folds. The procedure consists of extensive liposuction of the abdominal apron in order to loosen it, followed by insertion of a long purse-string suture that grabs the subdermal tissue at the caudal end of the epigastric crescent. Pulling up on the suture recruits the crescent into the breast as a reverse abdominoplasty, and the purse-string effect defines the fold and mushrooms out the breast. The suture is then suspended to the clavicle through a bone anchor. However, we now prefer a soft tissue suspension over the pectoralis muscle that is made tensionless with extensive Rigottomy and PALF release of the abdominal skin apron. RAFT allows for significant advancement of the epigastric apron past the deep muscle layer to add 150–250 mL of abdominal fat and 5–10 cm of skin into the breast. The resultant scarring allows the tissues to heal in their new position (Fig. 7.12).

We also found RAFT to be extremely versatile for primary breast reconstructions, primary augmentations (where it provides 100–200 mL of additional volume from the abdomen); for congenital tuberous breasts (where it provides the necessary lower pole fullness in one procedure); and for patients undergoing implant removal (where it can help create a new breast mound).

With the help of Brava, AFT, and RAFT, PALF prevents a regenerative, incisionless alternative to flaps for many indications.

Expert Commentary

Peter Rubin, MD, FACS

In this chapter the authors present a paradigm challenging concept of percutaneous aponeurotomy and lipofilling (PALF), as an alternative to flap procedures. Even the acronym "PALF" is a clever twist on the word flap. Indeed, this concept turns the traditional paradigms on end.

Traditional approaches to scar contracture release often involve excision of the scar and adjacent scar band to fully mobilize the tissue, adhering to the principle of "re-creating the defect." The resultant defect can then be treated by coverage with a local or distant flap, or skin grafting. The PALF principle, alternatively, dictates that the scarred tissue itself can be mobilized by up to 20–30% through percutaneous release of scar bands. As the authors point out, this is a very focused approach in which the scar is essentially meshed internally to allow mobilization in multiple dimensions. The newly meshed tissue matrix is then filled with lipoaspirate to complete the process. Fat grafting is well known to soften scars and can assist in tissue healing through improving vascularization. The authors favor a dilute aspirate for their procedures.

As the authors show, this concept can be effective in releasing significant scar contractures. The fact that tissues have a maximum advancement potential with PALF of 20–30%, mandates a wide area of treatment in order to properly mobilize tissues for certain defects. The authors use several enabling technologies in association with percutaneous aponeurotic lipofilling. One technology is the use of Brava external expansion. The authors have championed this technology as a method of expanding the skin envelope in breast surgery and improving vascularization prior to fat grafting. In conjunction with PALF, the authors can treat breasts that are heavily scarred, especially by radiation injury. The authors advocate both preoperative and postoperative expansion. Another innovative enabling technology is the use of a RAFT suture. RAFT, or "reverse abdominoplasty and fat transfer," mobilizes epigastric tissue in to the chest through the use of a large purse-string suture anchored to the clavicle. Through a combination of these techniques, very challenging post-mastectomy breast deformities can be reconstructed.

The authors are to be congratulated for developing a synergistic portfolio of innovative techniques to advance and repair tissue in a minimally invasive fashion. These techniques will most certainly have a place in our reconstructive treatment algorithms.

Access Figures 7.14 and 7.15, as well as case examples 7.4 and 7.5 online at http://expertconsult.inkling.com

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CASE 7.4 Breast Reconstruction with Brava, and Fat Transfer

Figure 7.14 (A) A 40-year-old woman presented 2 years after a bilateral mastectomy. She was not interested in having implants or flap reconstruction. After three Brava + AFT procedures, she regenerated >600 mL per breast and improved her body contour without any incisions. (B) At 6 months later, she feels she has gained back her lost breasts; they feel soft, natural, and have near normal sensation.