INTRODUCTION

Reverse tissue expansion exploits the well-known tissue expansion principle according to which, any tissue subject to a slight but constant biomechanical stretching, responds to the stimulus by growing. Having said this, our study outlines a new surgical procedure, which enables a total breast reconstruction with autologous fat tissue, namely reverse tissue expansion.

MATERIALS AND METHODS

The technique uses a breast expander following mastectomy, which is then filled regularly until the desired expansion is reached (Fig. 1); the expander is then deflated by approximately 100–150 cc of saline to allow the same or slightly greater amount of purified adipose tissue to be transferred to the mammary region; with an approximately 6-month interval in between sessions; this procedure is repeated until the required volume is reached. The number of surgical sessions depends on the size of the breast to be recreated. Once the expander is fully deflated, we proceed to its removal, followed by the replacement of a quantity of adipose tissue equal to or greater than the volume of the deflated expander (approximately 60 cc). Fat grafting is performed according to Coleman’s technique and the typical donor areas are the abdomen, flanks, and thighs.1 No infiltration of Klein solution is performed so as to minimize cell damage. Fat is harvested using a 10-cc luer-lock syringe connected to a 3-mm Coleman blunt tip cannula under a slightly negative pressure. Centrifugation is performed at 3,000 rpm for 4 minutes, and the refined fat is then transferred into 3 cc syringes. Retrograde injections of small aliquots of fat (1 cc) are needed to create a 3D structure, which facilitates the adherence between the fat itself and the vascularized surface and, therefore, the engraftment rate.2–4

Fig. 1. Preoperative picture showing a fully expanded submuscular expander.

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procedure are small/medium-sized breasts, fat availability, no smoking habits, and no history of connective tissue disease or diabetes. Irradiated patients are not excluded from the procedure.

RESULTS

In our unit, 24 selected patients have so far undergone mastectomy, followed by total breast reconstruction using reverse expansion technique, and results have been extremely satisfactory in terms of volume, shape, and mammary texture, with a low number of postoperative complications and a high level of patient satisfaction (Fig. 2).

CONCLUSIONS

The reverse tissue expansion is a versatile and easy procedure, which allows a Breast Unit to propose a total breast reconstruction with autologous fat tissue to a greater number of patients—without, however, precluding the opportunity to change the reconstruction process midway and to opt for the more traditional 2-stage implant-based reconstruction. The use of the expander facilitates the recreation of the infra-mammary fold and the borders of the new breast, allows the skin to expand, and facilitates the introduction and the engraftment of a greater volume of adipose tissue, thanks to the deflation of the expander and the consensual volumetric increase of the receiving site. As a consequence, this procedure requires fewer surgical steps to complete the breast reconstruction, in comparison with traditional fat grafting alone.

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