Annals of Plastic and Reconstructive Surgery

Case Study
Published: 22 Jan, 2021

Profunda Artery Perforator Flap as a Therapeutic Option for Breast Reconstruction of Tuberous Breast Deformity

*Marie-Luise Klietz[2,3], Maximilian Kückelhaus[1,2,3], Kamran Harati[1,2,3], Matthias M. Aitzetmüller[1,2,3], Tobias Hirsch[1,2,3] and Philipp Wiebringhaus[1,2,3]**

[1]Department of Plastic, Reconstructive and Aesthetic Surgery, Hand Surgery, Fachklinik Hornheide, Germany

[2]Department of Trauma Surgery, University Hospital Muenster, Germany

[3]Department Plastic and Reconstructive Surgery, Westphalian Wilhelms University of Münster, Germany

Abstract

The tuberous breast deformity as a malformation of the mammary glands describes a morbidity that is difficult to treat and characterized by incomplete breast development.

Up to now, volume gain has mostly been achieved by breast implants or autologous lipotransfer.

We hereby describe a two-step approach using a free micro-vascular profunda artery perforator flap and late breast reduction for reconstruction of a tuberous breast in an 18-year-old patient.

Introduction

The tuberous breast deformity as a malformation of the mammary glands describes an incomplete breast development, especially of the two lower quadrants with herniation of the glandular body into the enlarged areola [1].

This deformity goes along with high psychological stress and thereby most likely leads to restrictions in the Quality of Life (QAL) of patients [2].

While surgical treatment is excessively described to be challenging [3,4], recognized reconstruction procedures include reformation of the glandular body, reduction of the nipple-areola complex and correction of hypoplasia. Up to now, volume gain has mostly been achieved by breast implants or autologous lipotransfer [5-7].

Despite some of the advantages that these procedures offer (short operation time, inconspicuous scarring), there are also serious disadvantages. In autologous lipotransfer approximately half of the injected volume is re-absorbed [8]. Therefore, a single operation is often not sufficient. There is also a high risk of developing oil-cysts when transferring a large amount of fat into the breast [9]. Breast implants go along with well-known implant-associated complications such as capsular fibrosis, implant dislocation, rippling, or BIA-ALCL [10-12].

Material and Methods

We hereby present a case of an eighteen years old women, who visited our department with a type III tuberous breast deformity on her right side (cup size: b-cup) and a mamma hypertrophy on her left side (cup size: d-cup). Classification was performed following previously described algorithms [13]. The patient had a BMI of 21.

After consultation and intensive education, the patient consciously decided against reconstruction of the right side with implants. When applying for cost coverage the health insurance refused an autologous lipotransfer but approved the reconstruction with free microvascular tissue transfer. To ensure a satisfying outcome, we decided on a two-stage procedure (initial unfurling of the breast with reconstruction using a Profunda Artery Perforator (PAP) flap with periareolar mastopexy [14] and as second step the breast reduction of the contralateral side).

The day before the first surgery, the "Profunda Artery Perforator" of the PAP flap was visualized and percutaneously marked by color ultrasound sonography. During this examination, both the flow of the perforator and its course were displayed and marked on the skin.

The planned incision was then drawn according to the position of the perforator in the area of the proximodorsal thigh. For following inconspicuousness, care was taken to place the cranial

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Correspondence:
Philipp Wiebringhaus, Department of Plastic, Reconstructive and Aesthetic Surgery, Hand Surgery, Fachklinik Hornheide, Dorbaumstrasse 300, 48157 Muenster, Germany, E-mail: Philipp.Wiebringhaus@fachklinik-hornheide.de

Received Date: *11 Dec 2020*
Accepted Date: *19 Jan 2021*
Published Date: *22 Jan 2021*

Citation:
Klietz M-L, Kückelhaus M, Harati K, Aitzetmüller MM, Hirsch T, Wiebringhaus P. Profunda Artery Perforator Flap as a Therapeutic Option for Breast Reconstruction of Tuberous Breast Deformity. Ann Plast Reconstr Surg. 2021; 5(1): 1070.

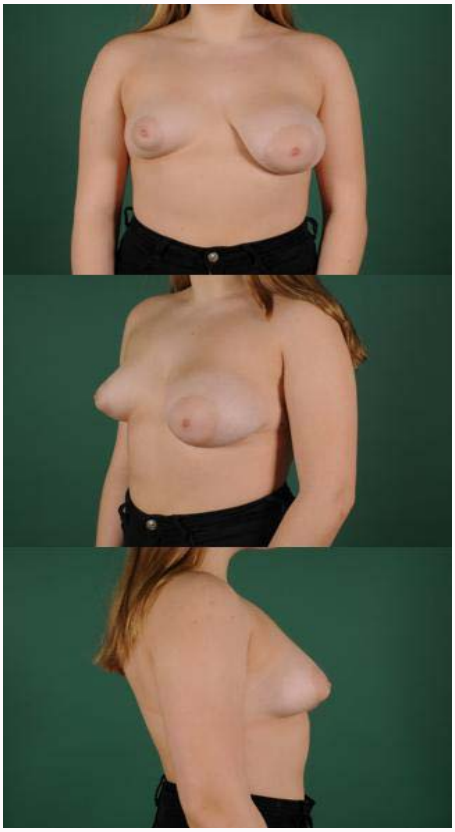

Figure 1: Preoperative tubular breast deformity and mamma hypertrophy in an 18 years old patient.

incision in a standing position in the area of the gluteal fold (sulcus glutealis). The caudal border of the flap was placed 7 cm caudally from the cranial incision line. The lateral limits of the incisions were marked by the ventral margin of the gracilis muscle and the lateral limit of the gluteal fold.

The preparation of the PAP flap (weight: 150 g) took place with the patient in a supine position her leg bent and rotated outwards.

In parallel, the second surgical team prepared the recipient region and the connecting vessels by unfurling the gland with an incision in the suspected new inframammary fold. An epipectoral pocket was created for the flap and internal mammary artery was exposed for microsurgical anastomosis. Before reconnecting the flap to the recipient vessels, the patient was drawn up intra-operatively and the flap was fitted into the breast and shaped accordingly. Right before end of surgery we performed a periareolar mastopexy using multiple tobacco pouch sutures to address the enlarged and slightly herniated nipple-areola-complex.

The donor region was closed in the sense of a vertical thigh lift by multi-layer suture techniques (gathering sutures, subcutaneous sutures and skin sutures).

The operation time was 187 min and the hospitalization time was 5 days.

The patient gave full written consent for publishing data and figures.

Results

After three months, the contralateral side was adjusted by breast

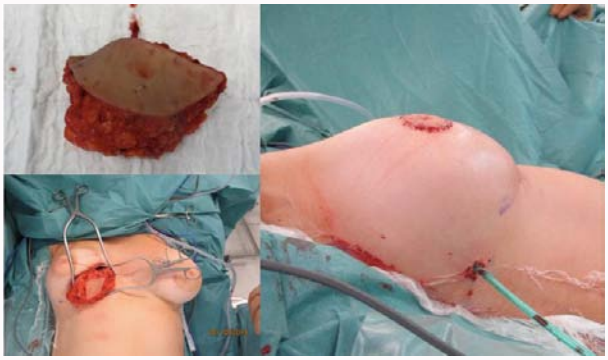

Figure 2: Reconstruction of the deformity with the PAP flap.

Figure 3: Right breast after reconstruction with the PAP flap and left side before breast reduction; PAP-donor-region.

Figure 4: Right breast four months after reconstruction with the PAP flap and left side 6 weeks after breast reduction; PAP-donor-region.

reduction. Using a conventional anchor technique 485 g of breast tissue was removed on the left side. Postoperatively the patient was very satisfied and showed no complications in both surgeries (Figure 1 and 2).

The operation time was 60 min and the hospitalization time was 2 days.

After evaluation of the Breast-Q questionnaire (Breast-Q-Version 2.0, Copyright 2017, Memorial Sloan Kettering Cancer Center, The University of British Columbia) it can be stated that the patient has no muscular or other complaints in the area of the thigh three months after surgery. The patient is psychosocially very stable (Rasch = 77) and sexually satisfied (Rasch = 59). The satisfaction with the breasts is evaluated preoperatively at Rasch = 23 and postoperatively at Rasch = 64 (Figure 3 and 4).

Discussion

The two-step-approach using a free microvascular profunda artery perforator flap represents a reliable and satisfying method for treating patients with tuberous breast deformity and large imbalance of their breasts.

Despite the associated additional scar on the donor-site and the extended scar for the internal mammary artery access in reconstruction

using microvascular transplants, implant associated complications (e.g. capsular contraction, implant at dislocation or BIA-ALCL) and the variable resorption rate in autologous lipotransfer can be avoided. Regarding to high incidence of capsular contraction and the necessity for re-operations in lipotransfer, the usage of free microvascular flaps represents the only one-step procedure for reshaping the tuberous breast [15].

When comparing with other free microvascular flaps the PAP flap is preferentially used in slim patients with small breast volume. Hereby it represents a predictable muscle sparing free flap from the thigh. In contrast to other thigh-harvested flaps like the Transverse Upper Gracilis flap (TUG flap) it shows a far-reaching extra muscular perforator leading to shorter surgical time and less donor-site morbidity [16,17].

Conclusion

Summarizing the postoperative results and the patient's satisfaction, we conclude that the PAP-flap is an effective method to reconstruct tubular breast deformity.

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