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## Case Report

# Autologous breast augmentation combining the harvesting of the Anterior Intercostal Artery Perforator (AICAP) and Lateral Intercostal Artery Perforator (LICAP) flaps in massive weight loss patient: A case report <sup>☆</sup>

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## ABSTRACT

Patients undergoing bariatric surgical procedures usually exhibit breast ptosis due to the quick weight loss. In this type of patients, the mastopexy represents a challenge for plastic surgeons considering the abundance of dystrophic cutaneous tissue, the loss of subcutaneous tissue and the impossibility to employ heterologous devices in the setting of Italian public healthcare. In addition, it is necessary to consider that patients undergoing post-bariatric surgery have increasingly high expectations. We describe a new reconstructive technique which combines and utilizes both the AICAP and LICAP flaps as "autoprosthesis". It could be considered a valid option for patients exhibiting a deficiency in the upper poles with hypotrophic and hypoeelastic skin texture, associated with poor glandular representation. This procedure proves to be an

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excellent alternative to breast implants both in the reconstructive surgery and aesthetic surgery settings.

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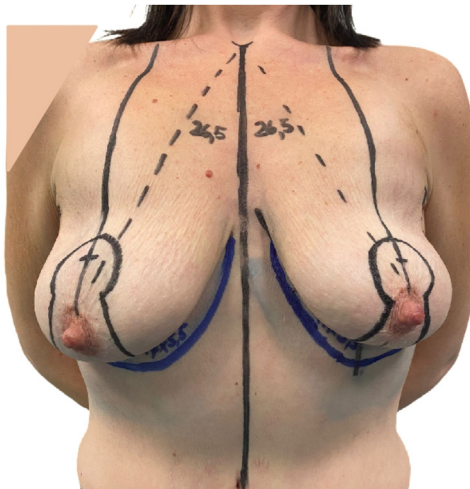
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## Introduction

Patients undergoing bariatric surgical procedures usually exhibit breast ptosis due to the quick weight loss. In this type of patients, mastopexy represents a challenge for plastic surgeons considering the abundance of dystrophic cutaneous tissue, the loss of subcutaneous tissue and the impossibility to employ heterologous devices in the setting of Italian public healthcare. In addition, it is necessary to consider that patients undergoing post-bariatric surgery have increasingly high expectations.<sup>1</sup>

## Patient and methods

A 38 female patient ex-smoker affected by Non-Hodgkin's Lymphoma in complete remission underwent sleeve gastrectomy surgery in 2015. The patient's starting weight was 102 kg before the surgery and a starting BMI of 39. In two years, the patient lost 40 kg reaching a BMI of 23. In 2022 she underwent abdominoplasty surgery and in 2023 thigh lift surgery. She came to our attention as she needed to correct her III Regnault grade ptosis breast, condition which caused her strong psychological discomfort. During the clinical examination the breast shows a visible depression of the upper quadrants and numerous stretch marks on the whole field. Sternal notch-nipple distance was 26.5 cm on the right breast and 26.5 cm on the left. Inframammary fold-nipple distance was 12 cm on the right breast and 11.5 cm on the left. The Breast Ultrasound performed on 10/11/2023 showed no focal alterations of solid or fluid nature. Deep planes were within normal limits (Figure 1).



**Figure 1.** Preoperative anterior view and design.

## Preoperative design

Preoperative drawings were executed with the patient in an upright position. The sternal notch-umbilical line, the inframammary fold line, the sternal notch-nipple line, and the mid-clavicular nipple line were drawn. A bilateral Wise pattern for mastopexy was drawn, and the neo-areolar position was defined using the Pitanguy maneuver. The vertical branches were marked using the Aufricht maneuver. Subsequently, with the patient in a supine position and arms abducted using a unidirectional Doppler, the Anterior Intercostal Artery Perforator (AICAP) and Lateral Intercostal Artery Perforator (LICAP) perforator vessels were identified and marked in red.

To identify the pedicle of the AICAP flap, a unidirectional Doppler was used along the intercostal space below the inframammary fold line, starting approximately 3 cm from the sternal margin. The maximum flap extension was defined using a pinch test (17 cm × 5,5 cm).

To identify the pedicle of the LICAP flap, a unidirectional Doppler was used in the region of the lateral chest wall between the anterior and posterior axillary lines along the intercostal spaces. The LICAP flap and its maximum extension were intraoperatively delineated based on the actual amount of tissue needed to fill the defect in the lateral quadrants (17 cm × 9 cm) (Figure 2).

## Surgical technique

The patient was positioned supine with abducted arms, and bilateral Wise pattern incision and de-epithelialization was performed. The areolar pedicle flap was sculpted with an upper pedicle. The lower incision of the mastopexy served as an exploratory incision to identify the pedicle of the AICAP flap. The AICAP pedicle was skeletonized and deemed valid based on diameter and intraoperative pulsatility assessed using a Doppler probe. The inframammary fold incision was extended posteriorly up to the posterior axillary line and used as an exploratory incision to locate the pedicle of the LICAP flap, which was also skeletonized and deemed valid, exhibiting a diameter greater than 2 mm and intraoperative pulsatility. After skeletonizing the pedicles, de-epithelialization of the AICAP and LICAP flaps was carried out bilaterally (Item 1).

The viability of the flaps was confirmed by scratch testing, resulting in bleeding of the flaps after their isolation. The LICAP flaps were employed as “autoprosthesis” to fill the outer quadrants of both breasts. The AICAP flaps were similarly employed to enhance the projection of the central quadrants

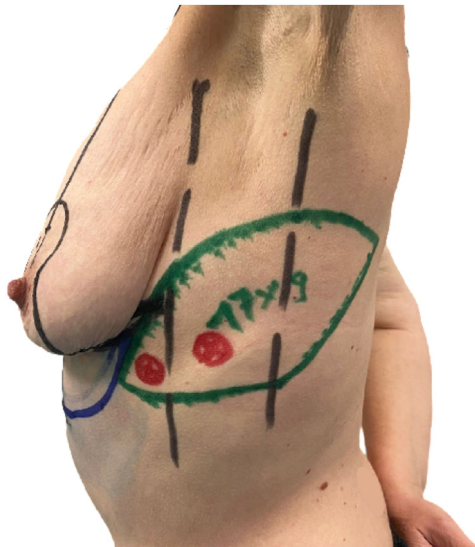


Figure 2. Preoperative lateral view and design.

bilaterally. The profile and shape of the breast cones appeared corrected through the inset of the two flaps. At the end of the inset, flap viability was assessed by injecting indocyanine green and using a fluorescence probe (Video 1).

To close the defects resulting from harvesting the AICAP and LICAP flaps, dissection along the fascial plane of the tissues was performed, and the defects were closed primarily. Finally, after ensuring meticulous hemostasis, two breast drains were placed.

## Discussion

This new reconstructive technique, which combines and utilizes both the AICAP and LICAP flaps as auto prosthesis, is considered a valid option for patients exhibiting a deficiency in the upper poles and hypotrophic, hypoeelastic skin texture, associated with poor glandular representation.

Glandular reshaping in post-bariatric patients is highly complex due to the compromised breast profile resulting from redundant skin and the altered skin texture following rapid weight loss. Patients who have undergone significant weight loss thus require not only an increase in breast volume but also lifting of the breasts. Considering the Italian National Public healthcare system does not allow in most of its settings the use of heterologous prosthetic devices in post bariatric patients, the utilization of autologous flaps could be a valid alternative.

In 2019 Vindigni et al. described the use of autologous flaps like the posteromedial arm flap during a massive weigh loss patient's combined surgery. During the brachioplasty procedure a fascio-cutaneous flap based on the vessels of the brachial artery system was harvested on both sides and then tunnelled across the axilla as it could increase the breast's volume after the mastopexy procedure. The authors state that this combined procedure allowed to achieve satisfying results avoiding the use of breast's implants.<sup>2</sup>

In 2009, Hamdi et al. described the preparation of the LICAP flap in post-bariatric patients noting the consistent presence of perforators at the level of the lateral chest wall at varying distances between the latissimus dorsi muscle and the pectoralis major muscle.<sup>3</sup> Earlier in 2006, versatile applications of ICAP flaps were described.<sup>4</sup> From our literature review no cases of simultaneous harvesting of AICAP and LICAP flaps during a mastopexy procedure in a post-bariatric patient have been reported.<sup>5</sup>



**Figure 3.** Postoperative anterior view. (Postoperative Lateral view.)



**Figure 4.** Postoperative lateral view. (Postoperative Anterior view)

## Results

The preparation of autologous flaps based on perforators in post-bariatric patients allows lifting of the mammary parenchyma with a simultaneous increase in volume. Additionally, post-bariatric patients generally exhibit larger diameter of perforator vessels, making them more reliable from a vascular perspective.<sup>6</sup> This technique is preferable considering that the use of breast implants more easily leads to a recurrence of mammary ptosis and unsatisfactory aesthetic results, along with the potential long-term need for reintervention due to the presence of heterologous materials.

In conclusion, this procedure proves to be an excellent alternative to breast implants both in the reconstructive surgery and aesthetic surgery settings (Figures 3 and 4).

## Ethical approval

Not required.

## Declaration of competing interest

None.

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## Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi: 10.1016/j.jpra.2024.05.013](https://doi.org/10.1016/j.jpra.2024.05.013).

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