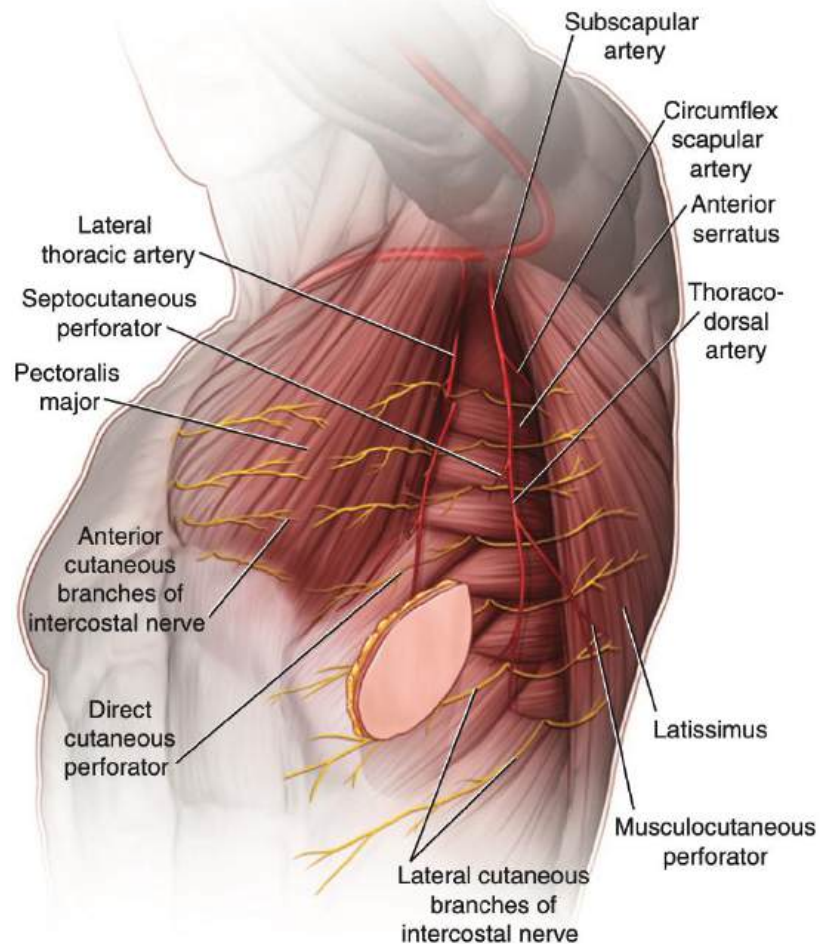




Co-funded by
the European Union

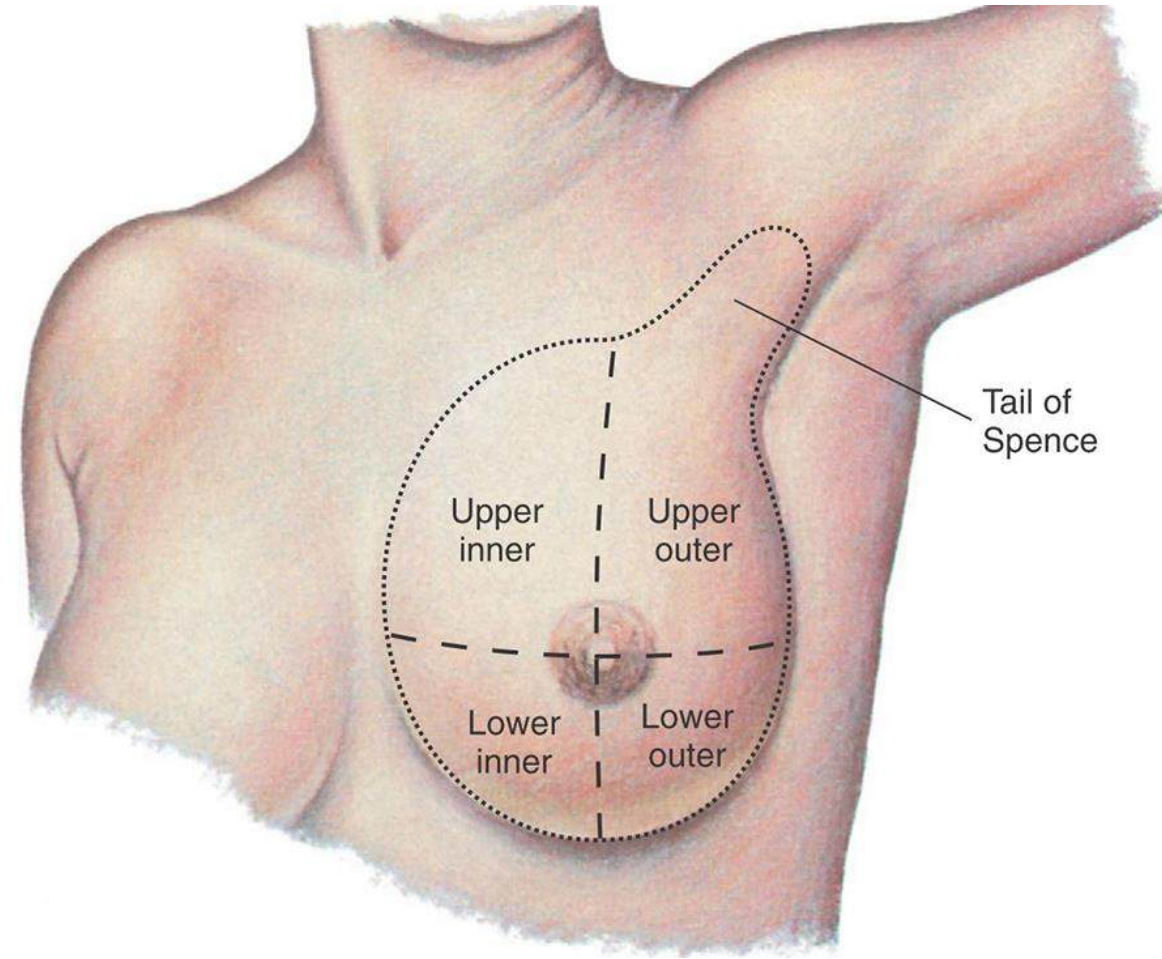
PERFORATOR FLAPS IN THE LATERAL THORACIC REGION FOR BREAST RECONSTRUCTION



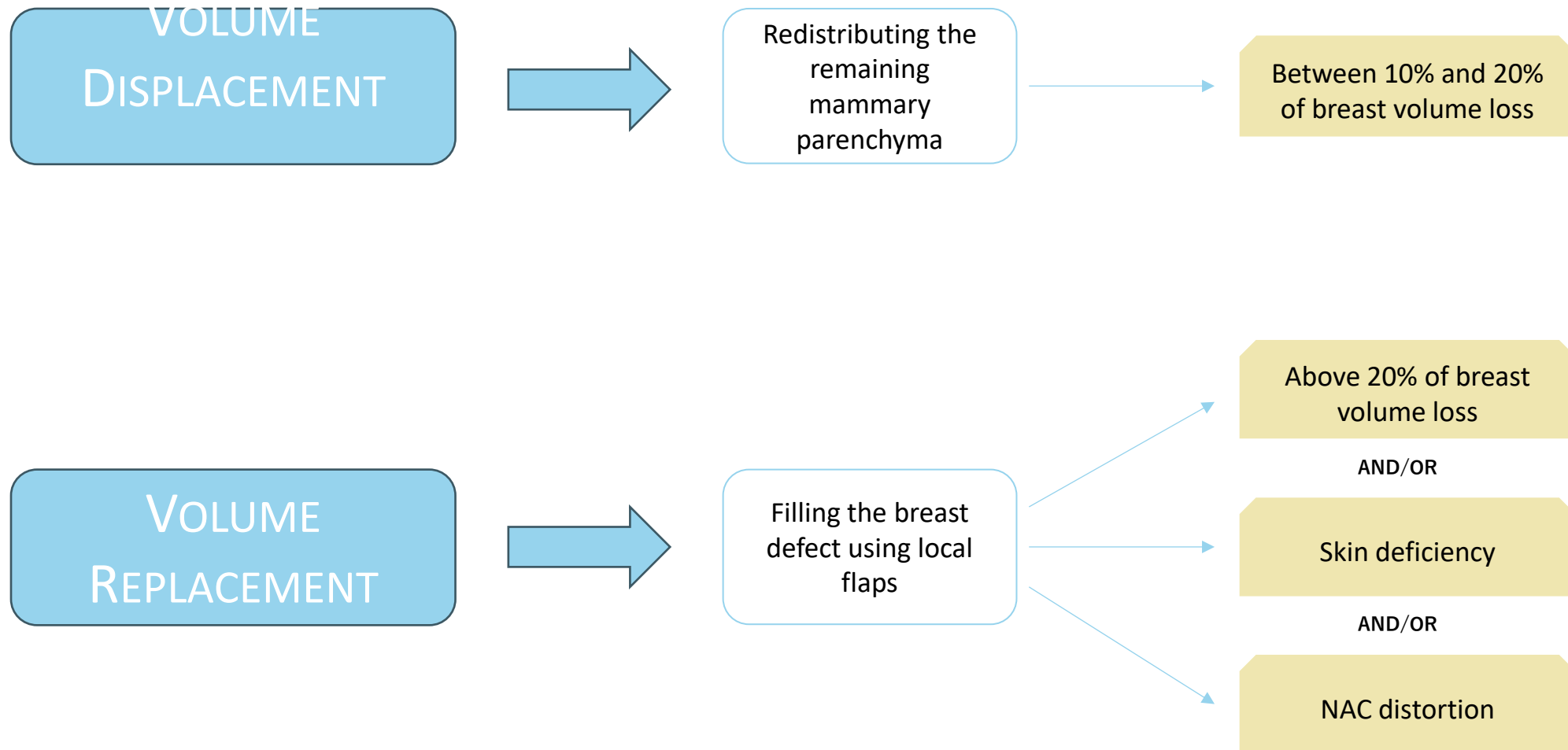
Dott. Lazzeri Domar, Dott.ssa Ratti

INTRODUCTION

- Breast conserving surgery (BCS) + postoperative radiation therapy (RT) is the **standard of care** for early stage breast cancer
- Same rate of overall and disease-free survival as do mastectomy



INTRODUCTION



INTRODUCTION

> [Plast Reconstr Surg.](#) 1999 Apr;103(5):1483-90. doi: 10.1097/00006534-199904050-00021.

Flow-through thin latissimus dorsi perforator flap for repair of soft-tissue defects in the legs

I Koshima ¹, H Saisho, S Kawada, T Hamanaka, N Umeda, T Moriguchi

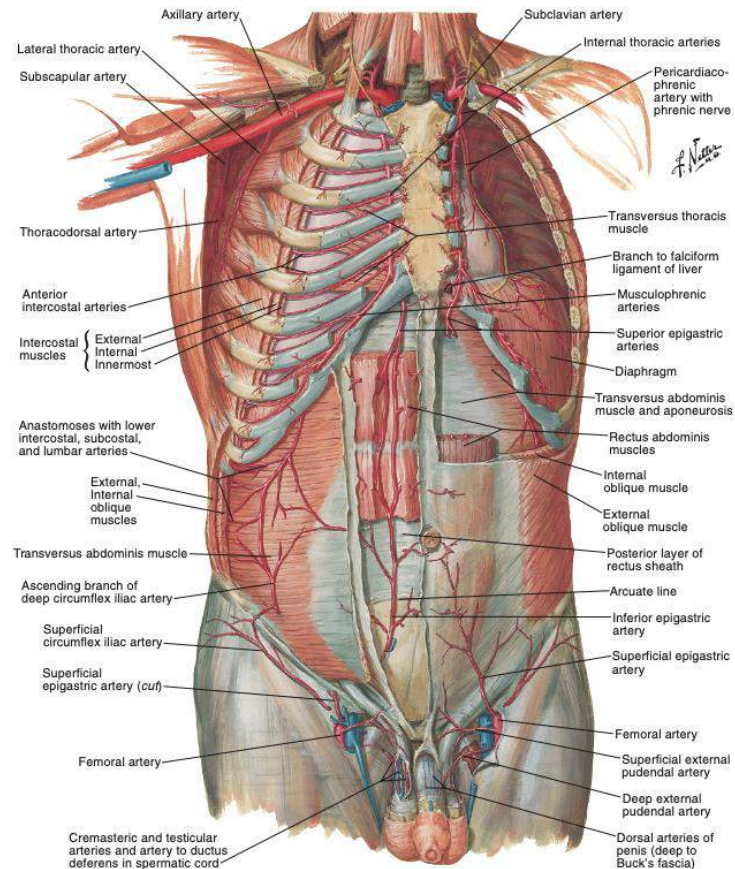
> [Plast Reconstr Surg.](#) 1995 Dec;96(7):1608-14. doi: 10.1097/00006534-199512000-00014.

Latissimus dorsi musculocutaneous flap without muscle

C Angrigiani, D Grilli, J Siebert

- **1976** → **Coninck et al.** for the first time mention the existence of cutaneous branches from the thoracodorsal and lateral thoracic artery
- **1999** → **Koshima** introduce the perforator concept
- Perforator flap from the lateral thoracic region was first attempted by **Angrigiani et al** under the name of the latissimus dorsi musculocutaneous flap without muscle

ARTERIAL SUPPLY OF FLAPS

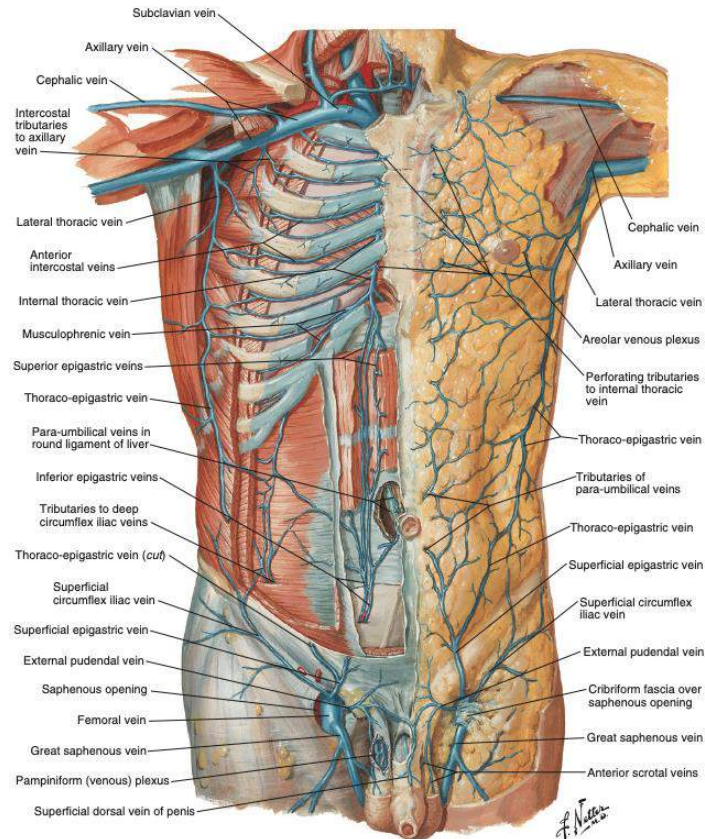


The lateral chest wall has a **triple blood supply**:

1. from the **thoracodorsal artery**
2. from the **lateral thoracic artery**
3. from the **lateral intercostal artery**

- **Fasciocutaneous flaps**, without violating any muscle, result in a significantly **minor morbidity** at the donor site
- **Lateral breast defects** can be reconstructed using the LTAP flap, LICAP flap, or the TDAP flap.

VENOUS DRAINAGE OF THE FLAP



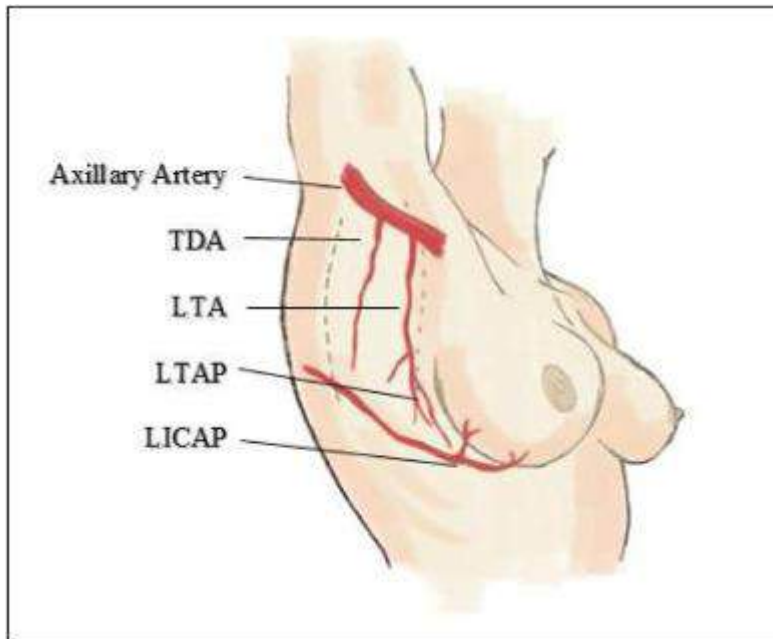
PRIMARY

- **Comitant veins** of the thoracodorsal, subscapular or lateral thoracic artery

secondary

- **Lateral thoracic vein** or other superficial

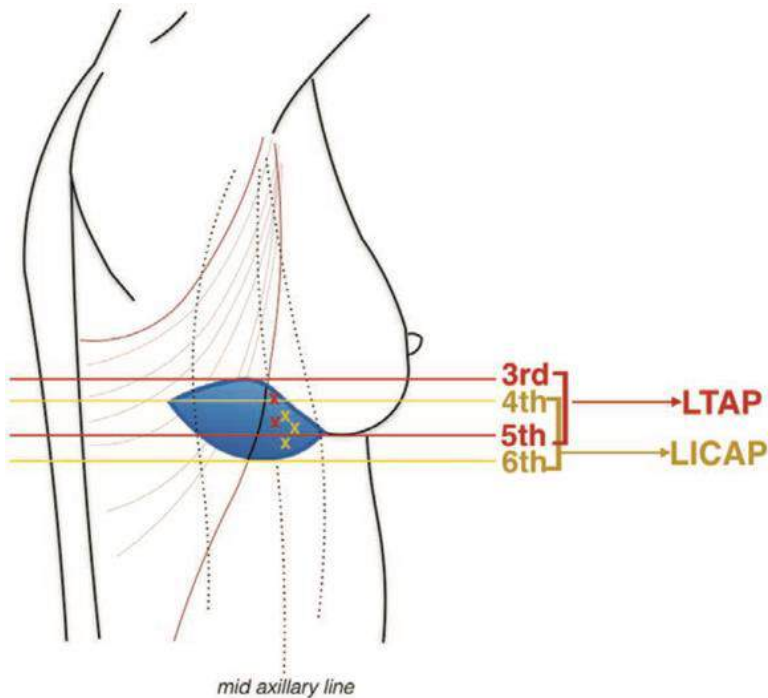
FLAP ANATOMY



- **LTAP flap** is based on a direct cutaneous branch of the **lateral thoracic pedicle**
- **LICAP flap** is based on the **lateral intercostal artery**
- **TDAP flap** is based on musculocutaneous or septocutaneous perforators that arise from the **thoracodorsal artery**
- **Preserving the thoracodorsal pedicle** without sacrificing the skin paddle of the LD musculocutaneous flap (LTAP & LICAP flaps)
- **Available volume is limited** and it is linked to the presence of redundant skin on the lateral chest wall



LTAP FLAP



- **Lateral breast crease incision**
- Flap is raised **from lateral to medial**
- **Pedicle is completely or partially dissected** until enough length is achieved

DISADVANTAGES

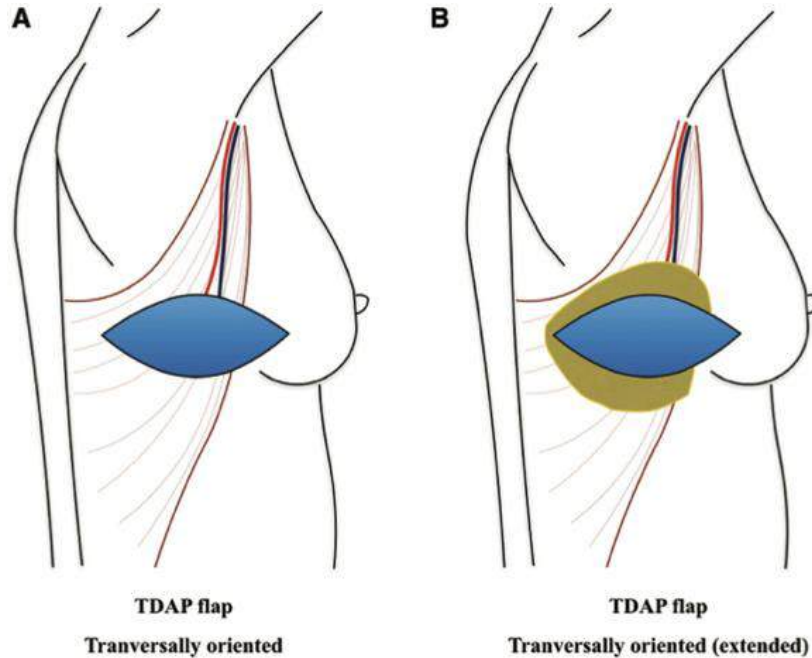
- **Anatomical variation** and the relatively **unstable diameter** of its **perforator vessels**
- **Tashiro et al** suggestion of performing a **preoperative Color Doppler Ultrasound**

ADVANTAGES

- Pedicle can be **partially or entirely dissected**
- **Minimal donor site morbidity**
- **Possibility of including LICAP perforators** provides additional perfusion and volume



TDAP FLAP



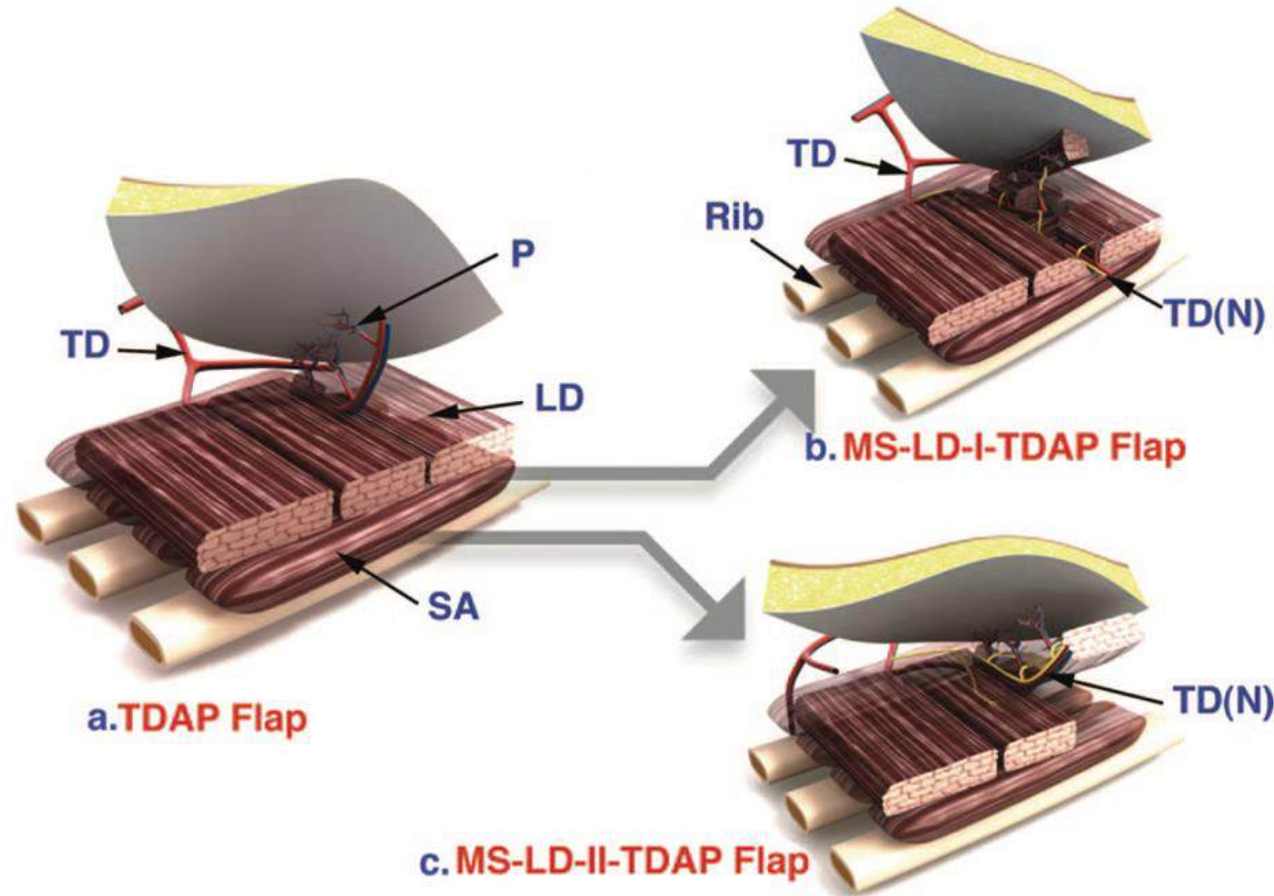
- **Expander** or **implant** can be safely used
- Flaps is designed to **include the located perforators at the proximal part**
- **Disadvantage** → lack of volume
- **Advantage** → can be **converted in an MS-LD flap** by including a part of LD muscle

MS-TDAP FLAP

> *Plast Reconstr Surg.* 2008 Oct;122(4):1111-1117. doi: 10.1097/PRS.0b013e31818459b4.

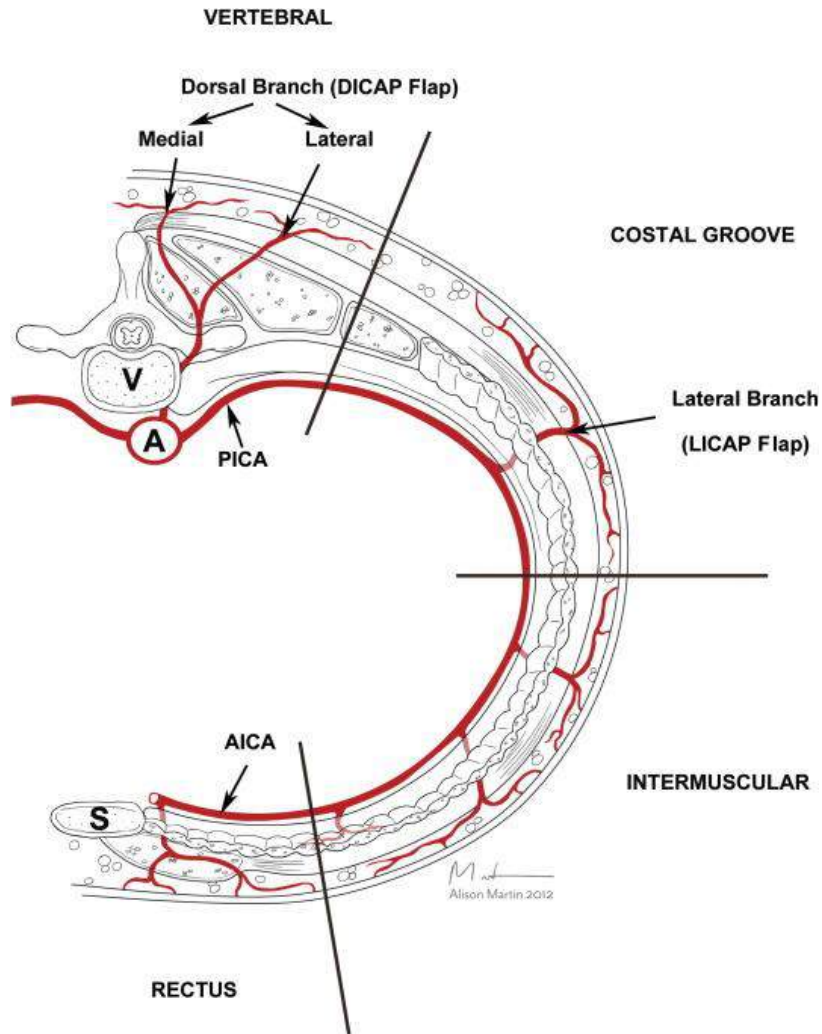
Shoulder function after harvesting a thoracodorsal artery perforator flap

Moustapha Hamdi¹, Tina Decorte, Martine Demuyne, Bob Defrene, Ann Fredrickx, Georges Van Maele, Herman De Pypere, Koenraad Van Landuyt, Phillip Blondeel, Guy Vanderstraeten, Stan Monstrey





LICAP FLAP



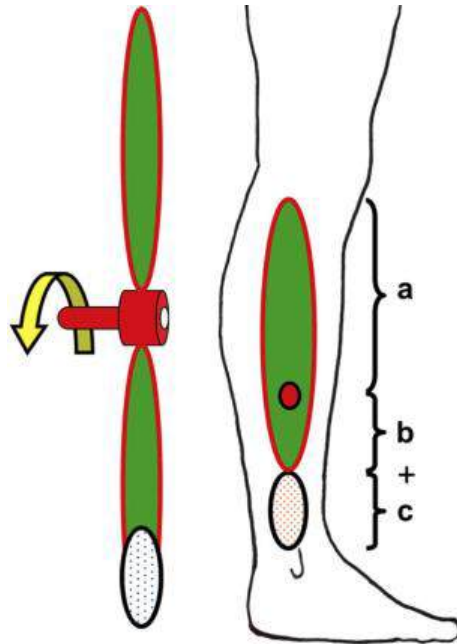
- Margin incision down to the underlying anterior serratus and LD muscles
- Suprafascial or subfascial dissection
- Pedicle's length of 3–5 cm
- LICAP perforators tend to be positioned more inferiorly (**4th–6th intercostal space**) and **laterally** than LTAP perforators
- **Disadvantage** → size and position variability of perforators
- LTAP perforator incorporation in LICAP flaps is quite common

PROPELLER VS PROPULLER FLAPS

Review > Clin Plast Surg. 2010 Oct;37(4):615-26, vi. doi: 10.1016/j.cps.2010.06.003.

The propeller flap concept

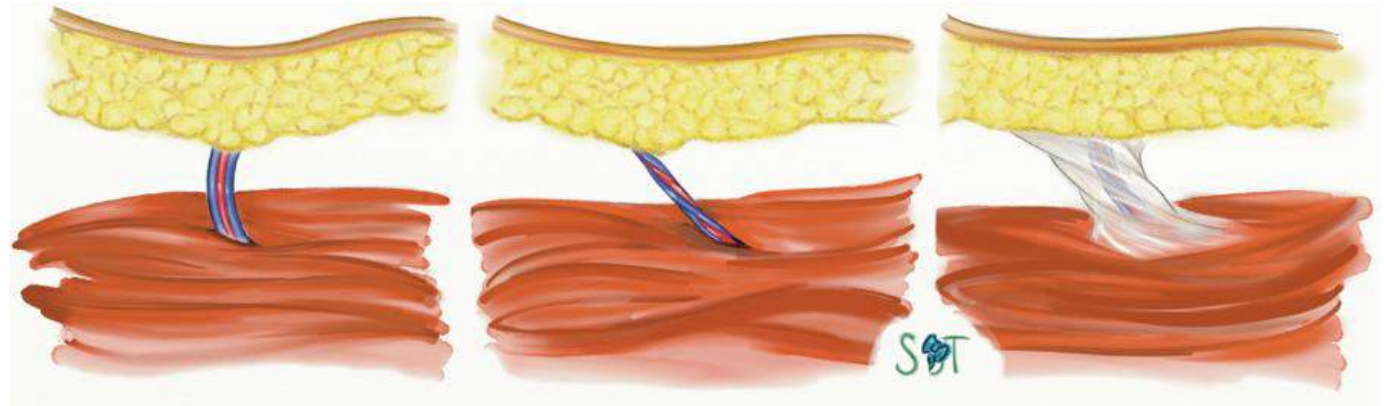
Tiew Chong Teo ¹



> Aesthetic Plast Surg. 2022 Dec 14. doi: 10.1007/s00266-022-03208-8. Online ahead of print.

The Ultrasound Evolution of Lateral Thoracic Perforator Flaps Design and Harvest for Partial and Total Breast Reconstruction

Giuseppe Visconti ¹, Alessandro Bianchi ², Alba Di Leone ^{2, 3}, Gianluca Franceschini ³,
Riccardo Masetti ³, Marzia Salgarello ²

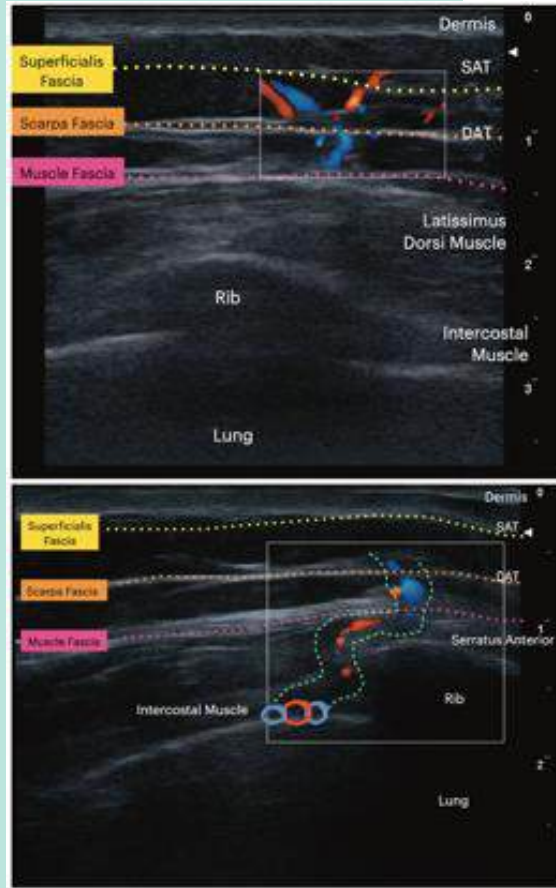




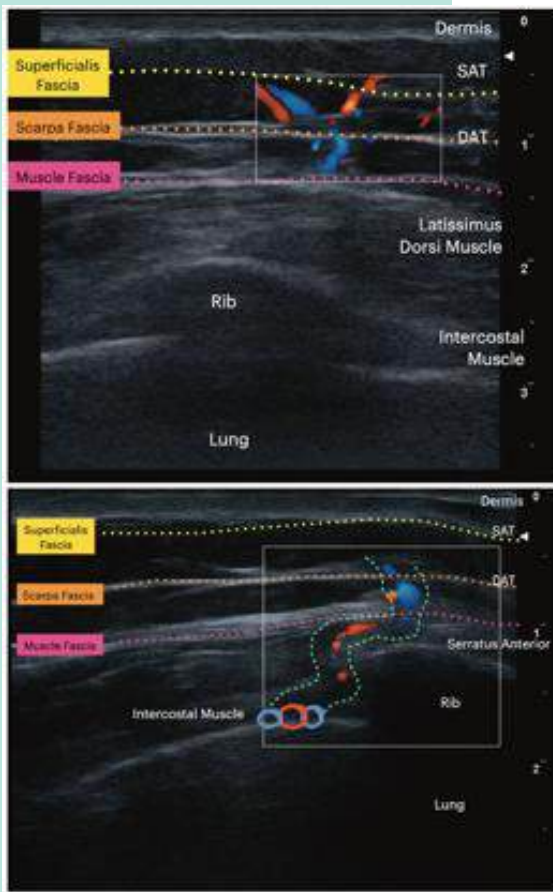
PROPELLER VS PROPULLER FLAPS

- Propuller flap is an **evolution of the perforator-based island flap (PBIF)**
- Applicable wherever there is some **degree of tissue laxity**
- Procedures are **easier** and **faster**
- There's **increased degree of freedom** in selecting the best perforator
- **Conventional exploratory incision** is not needed
- **NO microvascular dissection** needed

PREOPERATIVE STUDY



- Patients in the **same position** that they would be placed in during flap harvesting
- Identify the **anatomical landmarks**
- **High-Frequency Ultrasound Machine** with linear probes
 - **Flap thickness** from epidermis to the muscular fascia
 - **Microvascular anatomy**
- **ABSR** is evaluated for laxity and volume



PREOPERATIVE STUDY

THE IDEAL PERFORATOR

1. Adequate caliber (> 1 mm)
2. Close to the breast region
3. Favorable subcutaneous tissue

axiality



Flap is marked with orientation along the axillary skin roll respecting perforator axiality

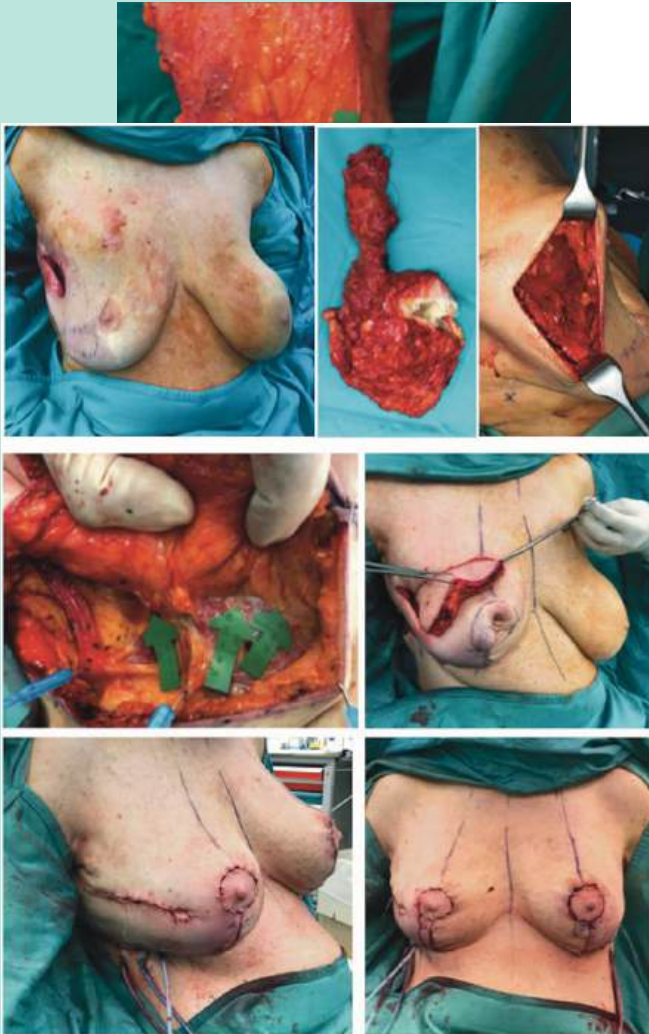
MARGINS

WIDTH

LENGTH

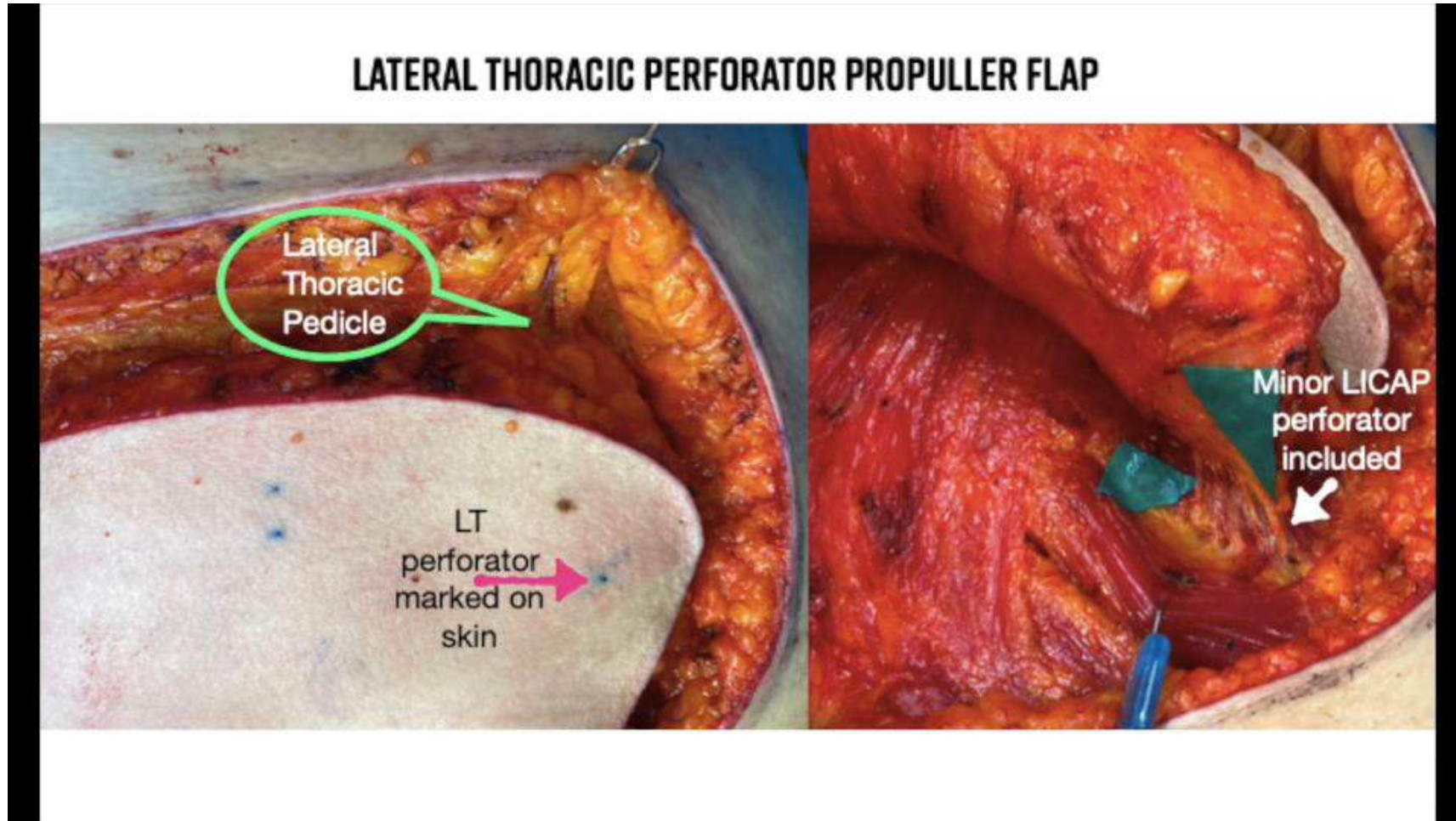


OPERATIVE TECHNIQUE



- Patient in the **lateral decubitus position**
- Edges of the flap margins are **injected with saline solution and epinephrine**
- Patient is turned in **supine position**
- **Flap is carefully incised down to the muscle fascia and raised**
- **Superfascial perfusion are discarded**
- **The flap is inset**
- **Flap is incised 2 cm before the location of the perforator**
- Fascia incision is continued circularly around the medialmost flap margins
- **Flap is propelled toward the breast**
- Donor site closure **contributes to push the lateral tissue excess** at the anterior axillary line inside the breast

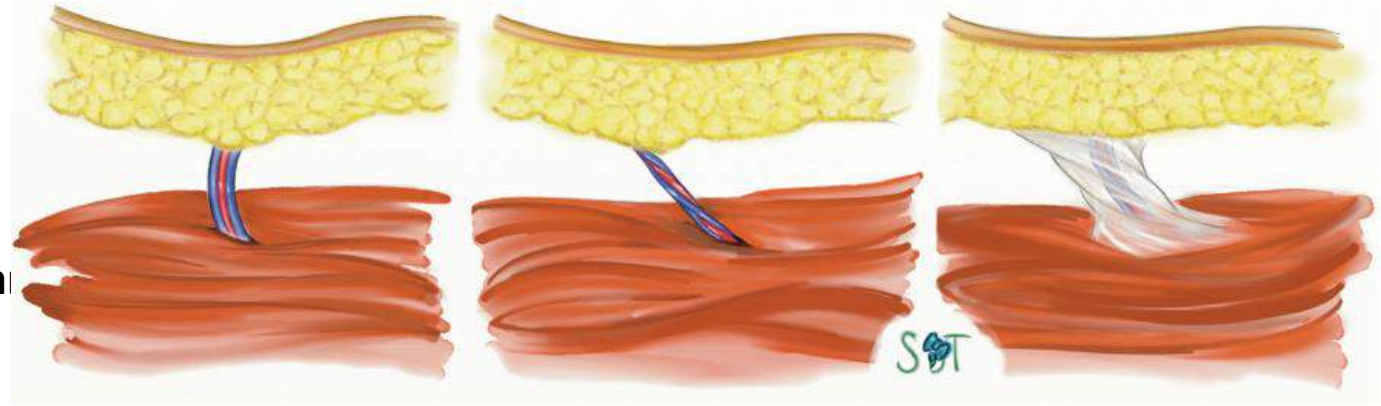
OPERATIVE TECHNIQUE



RESULTS

- **Total correspondence** between the ultrasound findings and the intraoperative findings
- **NO** partial or total **flap loss** was experienced; **NO donor site problems**; **NO** early complications
- **Suitable to all quadrants** independently of flap selection
- Mean operative time was **75 minutes** (range 53–125)
- **Very high patients' satisfaction**

CONCLUSIONS

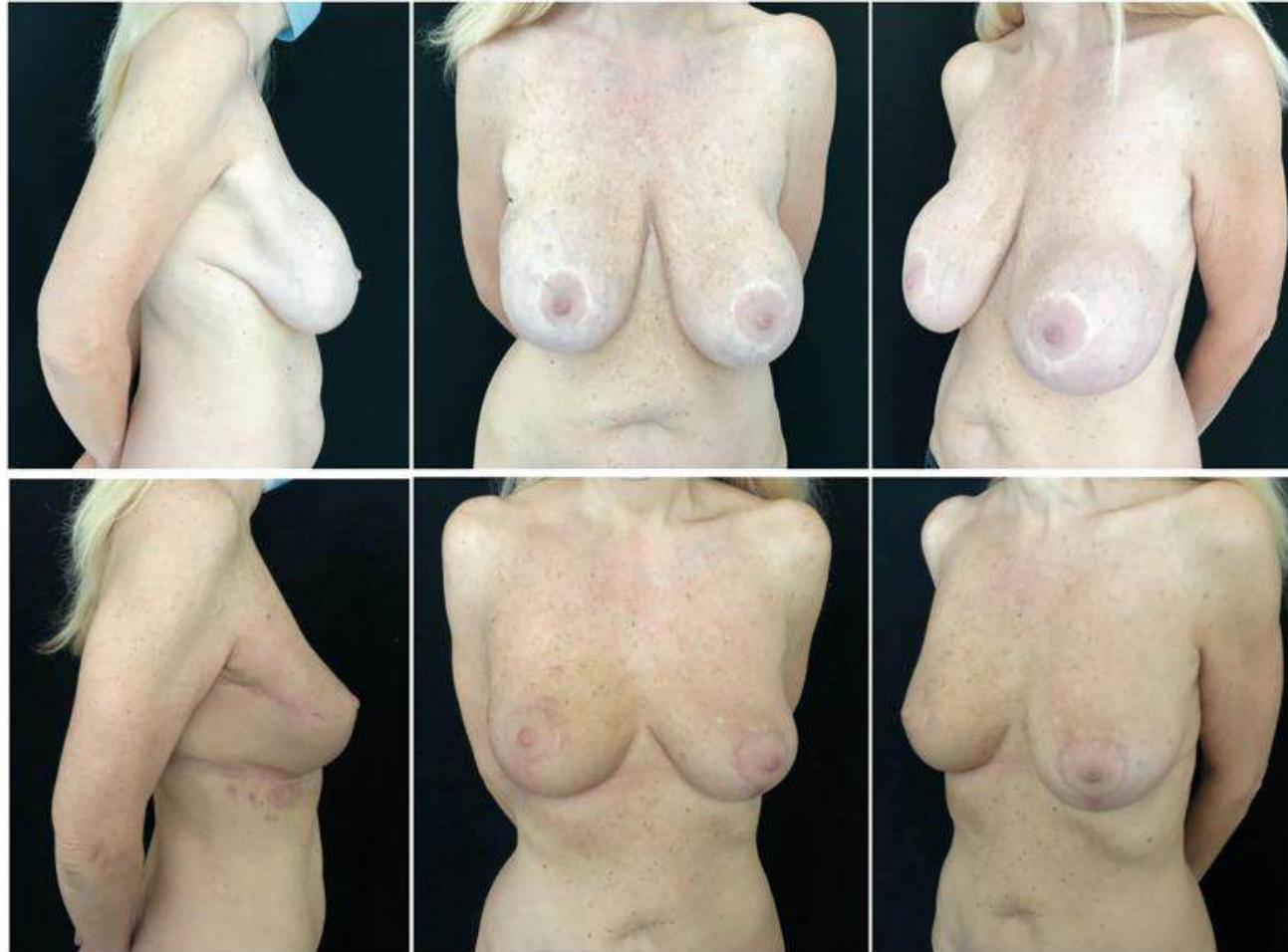


- Propuller method makes **LICAP** a **breast reconstruction**
- Possible to **safely pull the cuff of tissue** including the perforator without jeopardizing flap vascularity
- Cuff of tissue left intact allows to **include more than one perforator**
- **LICAP flap became the most commonly used** lateral thoracic flap for partial and total breast reconstruction
- **Judicious evaluation** regarding the estimation of volume needed for reconstruction to obtain good results
- **Mastering ultrasound technology** in perforator detection is paramount

AESTHETIC RESULTS



AESTHETIC RESULTS



AESTHETIC RESULTS

