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**“Surgical Delay-Induced Hemodynamic Alterations of the SIEA Flap for Autologous Breast Reconstruction”**

**Background:**

The superficial inferior epigastric artery (SIEA) flap allows transfer of tissue without violating the rectus fascia. Traditionally it is best utilized in single stage reconstruction when vessel caliber is 1.5 mm; 56-70% of SIEAs are <1.5mm and therefore not reliable. We aim to demonstrate the increased reliability of SIEA through surgical delay by quantifying reconstructive outcomes and delay-induced hemodynamic alterations.

**Methods:**

Patients presenting for autologous breast reconstruction between May 2019 and October 2020 were evaluated with preoperative imaging and received either delayed SIEA or delayed deep inferior epigastric (DIEP) reconstruction based on clinical considerations such as prior surgery and perforator size/location. Prospective data was collected on operative time, length of stay, and complications. Arterial diameter and peak flow were quantified with Doppler ultrasound pre- and post- delay.

**Results:**

Seventeen delayed SIEA flaps were included. The mean age ( $\pm$  SD) was 46.2 years old  $\pm$  10.55 and BMI was  $26.7 \pm 4.26$  kg/m<sup>2</sup>. Average hospital stay after delay was  $0.85 \pm 0.90$  days, and duration prior to reconstruction was six days to 14.5 months. Delay complications included one abdominal seroma (n=1, 7.7%). SIEA diameter pre-delay (mean  $\pm$  95% CI) was  $1.37 \pm 0.20$  mm and increased to  $2.26 \pm 0.24$  mm post-delay. A significant increase in diameter was noted  $0.9 \pm 0.22$  mm ( $p < 0.0001$ ). Mean peak flow pre-delay was  $14.43 \pm 13.38$  cm/s and  $44.61 \pm 60.35$  cm/s (n=4,  $p = 0.1822$ ) post-delay.

**Conclusion:**

Surgical delay of the SIEA flap augments SIEA diameter, increasing the reliability of this flap for breast reconstruction. SIEA delay results in low rates of complications and no failures in our series. While more patients are needed to assess increase in arterial flow, use of surgical delay can expand the use of SIEA flap reconstruction and reduce abdominal morbidity associated with abdominal flap breast reconstruction.