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ABSTRACT SUBMISSION TITLE: *A4 - Does the Donor Matter? An Analysis of Donor Nerve Selection in Neurotized DIEP Flap Breast Reconstruction Sensory Return*

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Abstract Text:

PURPOSE:

Neurotized deep inferior epigastric perforator (DIEP) flaps are increasingly utilized to improve and restore breast sensation in breast reconstruction patients. Most commonly, neurotization is performed by coapting a sensory branch of the tenth (T10), eleventh (T11), or twelfth (T12) intercostal nerve within the DIEP flap to the anterior cutaneous branch of the third intercostal nerve (T3) in the chest, as described by Spiegel et al. No previous study has investigated the effect of donor nerve selection on sensation of the autologous flap. In this study, we aim to compare the regional pattern of sensation return over time in DIEP flaps innervated with T11 and T12 to guide donor nerve selection.

METHODS:

Forty-two patients (65 breasts) underwent neurotized DIEP flap breast reconstruction. Of these, 35 flaps used T11 as the donor nerve, and 30 flaps used T12 as the donor nerve. All nerve coaptation was performed with a nerve allograft to T3. Pre- and postoperative sensation was evaluated using the AcroVal pressure-specified sensory

device (AxoGen, Alachua, FL) in four quadrants (superior, medial, inferior, lateral) and the nipple-areolar complex of the native or reconstructed breast at specified time points. Higher values correlate to a higher threshold of pressure needed to elicit sensation, indicating worse sensation return.

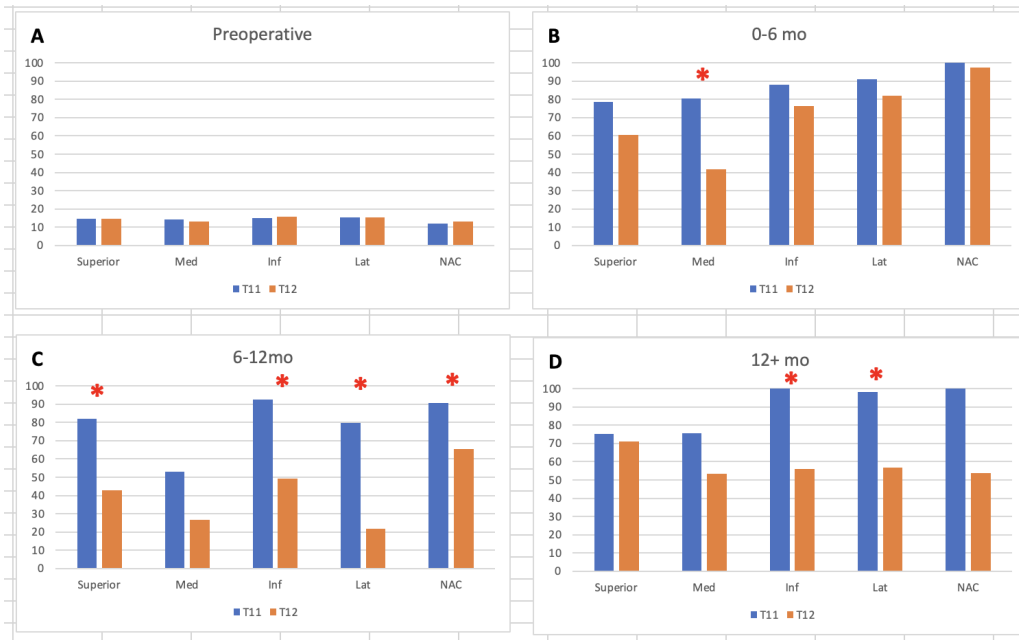
RESULTS:

Baseline characteristics, treatment details, and postoperative complications were similar between the two groups, except the T12 group experienced higher rates of skin necrosis (26.7% vs. 5.7%, $p = 0.047$). Preoperative sensitivity measurements were comparable between the two groups across all breast areas (Figure 1). In the first six months after reconstruction, the T12 cohort experienced greater sensitivity in the medial quadrant of the breast compared to the T11 cohort ($p = 0.019$). At 6 to 12 months after reconstruction, the T12 cohort had greater sensitivity in the superior, inferior, and lateral quadrants, and the nipple-areolar complex ($p < 0.05$). After 12 months, a significant difference persisted in the inferior and lateral quadrants ($p < 0.05$).

CONCLUSIONS:

We found a statistically significant improvement in cutaneous sensation of DIEP flaps innervated with a T12 donor nerve compared to T11, despite higher rates of mastectomy skin flap necrosis. To our knowledge, this is the first reported difference in sensation based on donor nerve selection; these results may guide future surgical decision-making to optimize sensory recovery.

Figure 1. Timeline of sensory return in T11 versus T12 donor nerve cohorts.





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