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Correspondence and Communications

Internal mammary usability as recipient vessels in DIEP breast reconstruction in the setting of previous radiation

Dear Sir,

Autologous breast reconstruction has become the standard of care over the last several decades. The recipient vessel for these patients with microvascular reconstruction has classically been the thoracodorsal (TD) artery. This artery has a reliable anatomic location and is often easily dissected and preserved when exploring the axilla as part of the oncological procedure.[1] Recent recommendations have supported the use of the Internal mammary (IM) vessels for free flap anastomosis. The IM vessel selection allows for better arterial inflow, medial breast mound placement, shorter pedicle length, and avoids axillary exploration with resulting scarring and lymphedema risk.[2-4] Temple et al documented a 20% rate of IM vessel conversion rate in patients who had previously radiated breasts.[4] The purpose of this study was to determine if pre-reconstruction radiation affects IM vessel usability in autologous breast reconstruction.

We performed a retrospective study of all patients undergoing unilateral or bilateral deep inferior epigastric perforator flap for breast reconstruction with previous radiation to the breast, from January 2006 to July 2011. Patient demographics, recipient artery used, and recipient vein size were recorded and analysed.

Two hundred eighteen DIEP flaps were performed in 154 patients (90 unilateral and 64 bilateral). All 154 patients received breast or chest wall radiation as part of their treatment therapy prior to reconstruction. The mean age of our patient population was 51 years of age (range 31–74) with a mean body mass index (BMI) of 28 kg/m^2. Sixty-one patients (40%) had immediate breast reconstruction. The remaining 93 patients (60%) had a delayed breast reconstruction. Fifty-six patients underwent complete axillary dissections (26%). (Table 1)

The internal mammary artery (IMA) and vein (IMV) were used as the recipient vessels in 214 DIEP flaps (98%). The thoracodorsal vessels were used as recipient vessels in only 4 flaps (2.0%). The mean IMV diameter was 2.8 mm. The mean BMI of this group was 27.6 kg/m^2. The thoracodorsal vessels were used on two left-sided breast flaps and 2 right-sided breasts flaps. The mean TD vein diameter was 2.75 mm. There was no significant difference seen between groups ($p = 0.49$). (Table 2)

Table 1 Patient demographics.

Timing of flap	Patients	Mean age	Unilateral	Bilateral
Immediate	93	51	25	36
Delayed	61	49	65	28

Table 2 Recipient vessels used and vessel diameter.

Group	Recipient vessels	Vein diameter (mm)	Axillary dissection	BMI (kg/m^2)
IMA	214	2.8	55	28
TD	4	2.75	1	27.6

The thoracodorsal vessels have conventionally been utilized as recipient vessels for autologous breast reconstruction due to the convenience of exposure with concurrent axillary dissection.[2] Saint-Cyr et al. analysed 1483 free flap reconstruction cases and found the TD vessel was selected more frequently in cases requiring axillary dissection and immediate reconstruction. IM vessels were selected more often in cases with prior axillary dissection, preoperative radiation, and sentinel node biopsy. Given the increasing use of sentinel node biopsy, fewer axillary dissections are being performed.[3] With the axillary contents remaining undisturbed, dissection of IM vessels has become more frequently used for recipient site anastomosis. Saint-Cyr et al. showed a 60% rate of sentinel node biopsy in 2004, marking a large increase from 15% in 2000. This correlates with a decrease in TD vessel utilization and increase in IM vessel utilization in their study.[3]

The IM and TD vessels range in size from 1 to 2.5 mm in arterial diameter and 1 to 4 mm in venous diameter with the majority of differences attributed to flow rates.[5] According to Lorenzetti et al., mean IM arterial blood flow rate is 25 mL/min (range 15–35 mL/min), while mean TD arterial rate was found to be 5 mL/min (range 2–8 mL/min). This high-pressure flow in the IM recipient vessel allows for the option of antegrade or retrograde anastomosis.[5] Saint-Cyr et al. found a conversion rate of 2.8% in TD vessels and 1.9% in IM vessels. They also determined that TD conversion rate was significantly associated with pre-operative radiotherapy and previous axillary dissection. IM conversion, however, was not significantly associated with any of these factors.[3]

According to our data, we identified only a 2% conversion rate for IM recipient vessels. The current literature conversion rates for IM vessels range from 2% to 7%.[2,3] However, these studies included patients that had not received preoperative radiation. However we have several limitations to our study. Due to the fact that our study is an observational retrospective study we cannot determine why the thoracodorsal artery was used in 4 cases. In one case an axillary dissection had been performed potentially exposing the TD vessel as a recipient artery. Therefore, it is very difficult to make any generalized conclusions about selection of TD over IM vessel from our study. Our study did point out that the IM vessels are more often of adequate quality than previously suggested even in the face of previous radiation. For this reason the IM vessels should continue to be used as primary recipient vessels in autologous breast reconstruction with previous radiation. In the event of poor vessel quality or intra-operative difficulties, the TD vessels should be the alternative option.

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Skin-reduction breast reconstructions with prepectoral implant covered by a combined dermal flap and titanium-coated polypropylene mesh

Dear Sir,

Skin-sparing mastectomy (SSM) and nipple-sparing mastectomy (NSM) are conservative mastectomies that developed after the important shift in breast cancer treatment that Umberto Veronesi introduced: “from maximum tolerable treatment to minimum effective treatment”. Since then, along with oncological radicality, major concern to the surgeon was represented by the golden goal of ensuring adequate coverage to the implant minimizing eventual complications related to skin flaps ischemia as well as maximizing cosmetic outcomes.[1]

In 2006, Nava MB et al.[2] presented an innovative reconstructive technique following skin-sparing mastectomy for medium-sized ptotic breasts. The authors described the use of an inferior deepithelialized dermal flap that was sutured to the dissected inferomedial fibers of the pectoralis major muscle, for breast implants full coverage, producing extremely satisfying reconstructive and cosmetic results. Nevertheless, even if subpectoral implant placement presents evident advantages as reduced rippling and minimal implant visibility and palpability, however, pectoralis major detachment may lead to morbidity, animation deformity and postoperative pain.[3]

In this regard, Caputo GG et al.[4] followed the prepectoral breast reconstruction trend and developed their own technique for IBR following skin reducing mastectomy by using a pre-pectoral implant covered by a dermal flap and acellular dermal matrix (ADM).

We report our experience performing immediate implant based breast reconstruction following skin reducing mastectomy with a pre-pectoral approach, by using a combined inferior dermal flap and Titanium-coated polypropylene mesh (TCPM), TiLoop Bra (TiLOOP Bra, pmf medical, Cologne, Germany) pocket.

From January 2014 to December 2015, 12 patients underwent this surgical procedure. Average age and BMI were 43,5 and 22,5. Main comorbidities were hypertension and hypothyroidism. No active smokers or diabetics were considered for surgery, and nobody had previously received radiotherapy. Follow up ranged from 12 to 24 months (average: 18) and outcomes were evaluated by measuring subjective patients’ satisfaction (BREAST-Q parameters, score 0-100, average: 92). Direct to implant reconstruction was performed using 17 silicone gel anatomical implants (Natrelle 410 - ranging from 275 to 410 cc). We recorded 1 case of superficial skin de-epithelialization at the inverted-T edges that healed spontaneously, no implant loss, nor perioperative infections or seromas (Figures 1 and 2). We believe our