

Breast reconstruction using free TRAM flap with microvascular anastomoses to internal mammary vessels: report of two cases

Tadeusz Witwicki, Edward Towpik, Sławomir Mazur, Lidia Sieńko, Janusz Jaworowski

Two successful cases of postmastectomy breast reconstruction using free TRAM flap anastomosed to internal mammary vessels are presented. The flap contains only a small inferior portion of the rectus abdominis muscle, therefore abdominal wall function may be less impaired than in cases, in which a pedicled flap is used. Vascularity of the flap island may be excellent, as the island is located on the territory of inferior epigastric vessels. However, flap survival relies entirely on the effectiveness of microsurgical anastomoses.

Rekonstrukcja piersi wolnym płatem TRAM z zespoleniem do naczyń piersiowych wewnętrznych: dwa pierwsze przypadki

Przedstawiono dwa przypadki rekonstrukcji piersi z użyciem wolnego płata z mięśnia prostego brzucha z poprzeczną wyspą skórno-tłuszczową, z mikrochirurgicznym zespoleniem naczyń nabrzuszných dolnych płata do naczyń piersiowych wewnętrznych. Naczynia piersiowe wewnętrzne preparowano w okolicy przymostkowej na wysokości drugiego żebra. Płat pobierano jedynie z niewielkim dolnym odcinkiem mięśnia prostego brzucha.

Sposób ten pozwala na pozostawienie pozostałej części mięśnia nieuszkodzonej, co znacznie zmniejsza uraz operacyjny w obrębie ściany brzucha. Ponadto – wyspa płata ukrwiona jest przez jej naturalną szypułkę – naczynia nabrzuszne dolne. Jeżeli jednak zawiodą mikrozespolenia, płat ulegnie martwicy – nie ma bowiem unaczynienia alternatywnego.

Key words: breast reconstruction, myocutaneous flap, microsurgery

Słowa kluczowe: rekonstrukcja piersi, płat skórno-mięśniowy, mikrochirurgia

The pedicled transverse rectus abdominis myocutaneous (TRAM) flap [1-3] remains the most frequently used method of autologous tissue breast reconstruction. The whole rectus muscle is dissected, cut at its distal origin and transferred together with skin island to the mastectomy site. The inferior epigastric vessels are also severed.

We present two cases of a „free” TRAM flap, containing only a small inferior portion of the rectus muscle with inferior epigastric artery and vein. Such flap is anastomosed microsurgically to the internal mammary vessels.

Case reports

Free TRAM flap breast reconstruction was performed in two women who underwent previous mastectomy for breast cancer.

One surgical team was preparing the internal mammary artery and vein. The parasternal part of the second rib was resected and the vessels were dissected without injuring the pleura (Figure 1). The vessels were cut and microclamps were put on their proximal ends. Artery diameters in reported cases were 1.5 and 2 mm, respectively, and vein diameters were 2 and 2.5 mm.

In the meantime, another team was dissecting the island together with only a small lower portion of the rectus muscle and with the inferior epigastric vascular pedicle. The microclamps were placed on both the artery and vein, the flap was completely detached from the surrounding tissues (Figure 2) and transferred to the postmastectomy site.

End to end anastomoses of the inferior epigastric and internal mammary artery and vein were performed under the microscope, using 10/0 microsutures. New breast mould was subsequently formed using the revascularized flap island. In the meantime, another team was closing the abdominal wall wound.

Total operating time was 6 hours in the first case and 4 hours in the second one. The difference resulted



Figure 1. Internal mammary vessels prepared for anastomosis.

mainly from difficulties in dissecting the internal mammary vessels in the first case. No complications were observed postoperatively. The patients were discharged after 10 days.

Commentary

Vascular supply of a „classical” upper pedicled TRAM flap comes from superior epigastric vessels which enter rectus muscle at the costal margin level. However, skin island which lies below the umbilicus is located on the territory of inferior epigastric artery and vein. These vessels are severed during flap preparation and subsequently the island is supplied only by terminal branches of superior epigastric vessels which join the inferior epigastric territory in a complex collateral network in the periumbilical area [5-9]. The flap vascularity may therefore be impaired; this applies mainly to venous outflow, but to a certain extent also to arterial inflow.

The pedicled TRAM flap vascularity may be enhanced by surgical delay [10-12] or by additional anastomoses of inferior epigastric artery and/or vein to the recipient vessels at the mastectomy site (superdrained or supercharged flaps) [13-15]. Surgical delay has been used by our group since 1986, and microvascular augmentation since 1996 [16-17].



Figure 3. Anastomoses completed. Note that only a small portion of the rectus abdominis muscle is required

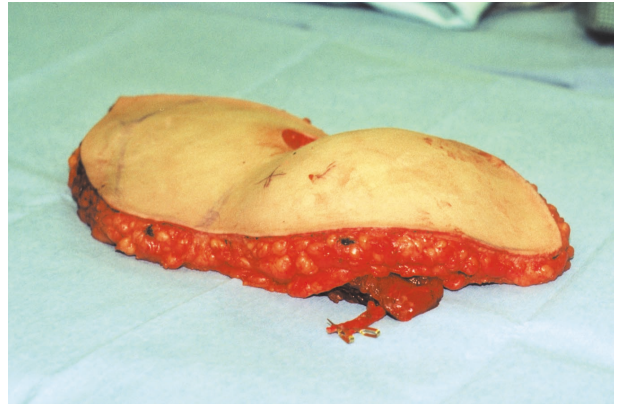


Figure 2. Free TRAM flap with inferior epigastric vascular pedicle ready for anastomoses.

An alternative approach is to use a „free” flap which ignores the upper pedicle and contains the island and only a small lower portion of the rectus muscle with inferior epigastric artery and vein [18-24]. Inferior epigastric vessels are subsequently anastomosed either to thoracodorsal or internal mammary vessels. This provides the most natural vascular supply to the flap, as the island is originally located on the territory of inferior epigastric pedicle. However, the survival of such flap relies entirely on the efficiency of microsurgical anastomoses, as the upper pedicle does not exist. Any failure of those anastomoses results in flap necrosis.

Free TRAM flap requires only a small portion of rectus muscle, therefore abdominal wall function is expected to be less impaired than in pedicled or microvascularly augmented pedicled flap, when a whole muscle is transferred [25, 26]. Thus it appears to be an attractive alternative in hands of an experienced microsurgical team.

Tadeusz Witwicki M.D.

Department of Breast Cancer and Reconstructive Surgery
The Maria Skłodowska Memorial Cancer Center
and Institute of Oncology
Roentgena 5, 02-781 Warsaw, Poland

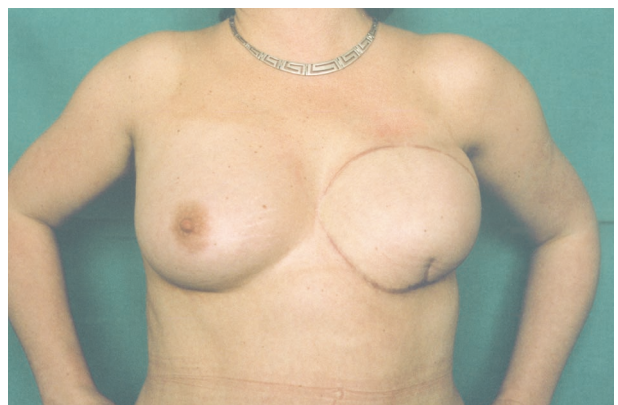


Figure 4. Postoperative result 3 months after the surgery.

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