

## CONFERENCIA MAGISTRAL

# From perforators to progenitor cells-milestones in breast reconstruction

**Eva M. Weiler-Mithoff**

*FRCS Ed, FRCS Glasg (Plast), Consultant Plastic Surgeon, Canniesburn Plastic Surgery Unit, Jubilee Building, Glasgow Royal Infirmary, Glasgow, Scotland*

Breast reconstruction plays a significant role in a woman's physical, emotional and psychological recovery from breast cancer. Utilization of the patient's own tissues gives the most natural, most durable and the best cosmetic results in breast reconstruction. Fat has become the most important tissue for partial or total breast reconstruction.

Free flap surgery allows for a safe transfer of large amounts of tissue with a higher degree of freedom and flexibility compared to pedicled flaps. The lower abdomen is often an abundant source of tissue for autologous breast reconstruction. A sizeable breast mound can be created without an implant with tissue, which is usually discarded during an aesthetic abdominoplasty procedure. The donor defect is acceptable and often a cosmetic improvement. The main disadvantage is donor site morbidity where myocutaneous flap harvest leads to loss of function of the donor muscle. The extent of abdominal wall weakness is related to:

- The extent of muscle resection.
- Extent of fascia resection.
- The use of a mesh to repair the abdominal wall.

Perforator flaps are the ultimate refinement of free autologous tissue transfer, providing the necessary tissue for reconstruction yet sparing the donor muscle and fascia.

The free deep inferior epigastric perforator (DIEP) flap preserves the whole of the Rectus abdominis muscle. The skin ellipse is transferred after meticulous dissection of perforating vessels through a split in the muscle to the deep inferior epigastric vessels.

The DIEP flap still has all the potential flap complications of any free tissue transfer but donor site complications and morbidity are reduced, maintaining abdominal and back extensor muscle strength, reducing postoperative pain and hospital stay. The vascularity of the transferred tissue is not compromised and incidence of fat necrosis is no different from the standard free TRAM flap.

Women undergoing breast conservation therapy (BCT) for breast cancer are often left with contour defects and few acceptable reconstructive options. The re-discovery of Lipomodelling has revolutionized breast reconstruction surgery in recent years.

Traditional fat transfer of larger defects after BCT or heavily scarred and irradiated recipient sites can be associated with poor graft take, fat necrosis and formation of oil cysts. Adipose-derived regenerative cell (ADRC)-enriched fat grafting for reconstruction of such defects is thought to facilitate long term retention of fat grafts by angiogenesis, prevention of cell death and direct repair of surrounding tissues.

Adipose tissue is collected via syringe lipoharvest and then processed during the same surgical procedure using a closed automated system that isolates ADRCs and prepares a fat graft for immediate re-implantation. The largest prospective trial of ADRC- assisted fat grafting to date, the RESTORE 2 trial is a single-arm, multi-centre clinical trial which enrolled 71 patients post-BCT with defects up to 150 ml. A high rate of patient and investigator satisfaction with the results was reported. Independent radiographic core laboratory assessment demonstrated improvement in the breast contour on blinded assessment of MRI sequences. There were no serious adverse events associated with the procedure. There were no reported local cancer recurrences. Injection site cysts were reported in ten patients.

## References

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