
Then, now and later

In mid-2017, I attended the annual audit meeting of our plastic surgery unit at The Royal Melbourne Hospital which encompassed not only the June 2016–June 2017 period, but in addition the past five years of free flap surgery. An astounding success rate (99.5%) with only four total flap failures in a series of 769 was presented. One loss in the current year of 189 cases and three of the years with no flap loss at all!

When I reflected on our early days of free flap surgery in the 1970s an average of one in three cases went back to theatre with only half being salvaged. What then had changed over the decades to ensure such a success rate? Obviously, there were many factors—we were pioneering new techniques as we tested new donor sites; the microsurgical suture had progressed from a sharpened metal precipitate on thread to the superb swedged needle with its monofilament suture, pioneered by Professor Robert Acland and refined by S&T together with his microsurgical instruments and clamps; we sought flaps with longer pedicles and larger calibre vessels since early experimental work reported only 80 per cent survival of flaps with vessels of diameter less than one mm; and we sought normal recipient vessels outside the field of trauma or radiotherapy. These were some of the factors that challenged and then improved the success rate but, for our team, our greatest enemy was vessel spasm which invariably increased the operating time and was often compounded by late recognition of a failing anastomosis by a tired surgeon. Almost overnight this was reversed by warming the patient and maintaining the circulation with warm intravenous infusion.

Suddenly our success rate jumped, especially choosing long pedicled latissimus dorsi and rectus abdominis flaps with large calibre vessels. At one stage Dr Russell Corlett and I succeeded in performing 100 successful transfers without a loss. However, when at your top the only way is down. We lost two of the next five! Each were leg trauma cases with muscle flaps attached to an unrecognised deep vein thrombosis that did not present for three or four days at which time our skin graft cover over the muscle began to separate.

The other factor that improved our success rate was early detection of anastomotic compromise and hence patients were kept in the recovery room for longer and the flaps were monitored by residents from theatre who stayed with the patient overnight for the first 24 hours!

When our recent RMH results were analysed further the indications for free flap transfer fell into three main groups—breast reconstruction, head and neck oncology and trauma. Although 12 different donor flaps were used, 90% utilised the ALT, DIEP (40%), RFF and the fibula. All with long pedicles and vessels in excess of 2 mm for anastomosis. Hence keeping our patients warm; using flaps with long pedicles of large calibre to access recipient vessels outside the reconstructive defect; early detection of complications and better instrumentation have all compiled to improve the success rate of free tissue transfer.

Having said this, we are now entering an era where we are reverting back to smaller vessels by some surgeons such as JP Hong, Isao Koshima and Paco del Pinal who are using ‘supermicrosurgery’ to transfer flaps connecting vessels as small as

0.5 mm. Are we all faced with becoming super-microsurgeons or is bigger still best? Remember however, ‘What goes around comes around’—and goes around again!

G Ian Taylor AO MBBS FRACS

The Taylor Lab, Dept of Anatomy and Neuroscience University of Melbourne, Melbourne, Victoria, AUSTRALIA

*Honorary Editor, Australasian Journal of Plastic Surgery
St Leonards, New South Wales, AUSTRALIA*

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