Editorial

New technology in breast reconstruction

The current edition of *Gland Surgery* offers a range of advances in many aspects of breast reconstruction, describing technologies in preoperative planning and volumetric analysis to operative outcomes, and from microvascular to prosthetic reconstructive options. While there is certainly contention amongst individual practitioners as to the best reconstructive option in a given setting, the articles included in this edition offer techniques that are leading the way at improving outcomes in the range of fields within the broader topic of breast reconstruction. This leads on nicely from the recent edition of the journal, guest-edited by Prof. Nahabedian (1), in which a range of new innovations in breast reconstruction were explored, some already employed widely in many centres, and others still in evolution. The current edition takes this another step further, demonstrating the evidence for these and other new technologies through high-level manuscripts comprising some systematic reviews of the literature, and some large comparative studies in high volume centres. The findings are novel and indeed eye-opening.

The collection of papers in this edition provides both new information and a contemporary update on exciting advanced techniques for breast reconstruction. The use of CTA in the peri-operative imaging of perforator flaps has now become routine rather than experimental in research settings. Newer modalities are used in some institutions, with MRA a prime example, and perhaps newer modalities are on the horizon. We now have readily available techniques to accurately plan reconstructions, measure volumes and pre-operatively customise operations, which have hitherto been unavailable. The work around 3D volumetric analysis and haptic modeling is, of course, of much interest, particularly when we consider the futuristic building of pre-printed biological implantable scaffolds and adipose/stem cell regenerative treatments.

In the not too distant past, a microsurgical case was considered a major event for an institution, and the process carried much mystique, with the whole hospital put on notice and the entire day set aside for these difficult, complex and demanding cases. This is not the case in the current age, with groups describing three consecutive microsurgical cases in a single day in a single theatre as a routine. The paper in this edition that describes this, outlines the microsurgical efficiency that has led to increased rates of breast reconstruction, particularly autologous reconstruction, in their unit. Making an operation quicker is not about performing the cutting, dissection and sewing faster and potentially more recklessly. Rather it is about eliminating the "unnecessary steps" and building teams and protocols. Professor Ramakrishnan and his group highlight these steps.

The use of the microvascular anastomotic coupler is a technology that divides many surgeons. While some suggest that it may de-skill microsurgeons over time, others report that the time-saving is not only cost-effective, but enables more cases to be done, thus increasing through-put. When things get difficult in microsurgical anastomoses, we draw on well-rehearsed and expert technique to get us out of trouble, and the only real opportunity to rehearse/practice this skill is by repeatedly performing hand sewn anastomoses. By removing 1-2 anastomoses per case, we run the risk of losing skills. However, the article herein that addresses this topic, explores improvements in clinical outcomes, the first such paper to do so. As such, this provides robust evidence to potentially sway the indecisive surgeon.

Operative modifications, such as stacked DIEP flaps in microvascular cases, are of great interest and lends itself to the concept of 3D volumetric pre-planning of cases and "custom builds". With a combination of vascular and soft-tissue modifications, we may be able to optimize autologous reconstruction, and lends itself to consideration for prefabrication and prelamination.

New technologies in immunofluorescence for assessing tissue viability and lymphatic flow are at the forefront of breast cancer and breast reconstruction management. These are evolving rapidly, and while previously of poor resolution and expensive, newer units are portable, cheaper and now in more widespread clinical use. The assessment of mastectomy skin flaps is of great importance to reconstructive surgeons—often the quality of a reconstruction is dependent on the mastectomy flaps that have been left post-mastectomy. Unfortunately, there is no consensus between excisional breast cancer surgeons about the degree of excision in a skin-sparing mastectomy, with wide variation in disruption of the inframammary fold, the extent of skin resection, the thickness of mastectomy flaps, and the need to resect the pectoralis major fascia. This makes the assessment of skin viability vital for precise reconstruction, and the technologies for performing this is described herein.

There has been a paradigm shift in the management of breast cancer, particularly with regard to the use of neoadjuvant therapy before mastectomy, both in respect to chemotherapy and radiotherapy. This places a significant burden on the reconstructive surgeon, and in particular can make the use of implant reconstruction more contentious. There are recent studies that describe the relatively new concept of 'delayed immediate' reconstruction, i.e., using tissue expanders at the

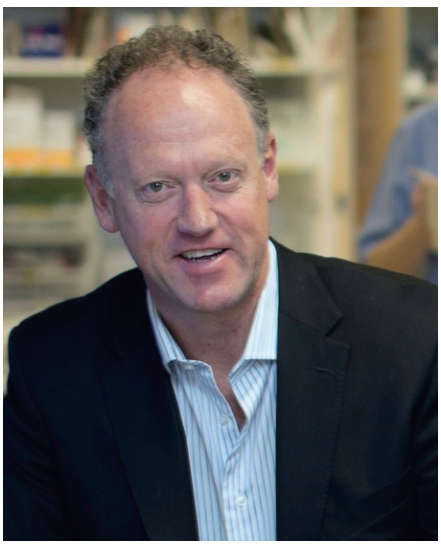
time of mastectomy, irradiating the breast with the expander, and then performing a delayed autologous "immediate" reconstruction at three to 4 months post completion of radiotherapy. This is discussed in the papers on breast implant/ADM. Other controversies with both prosthetic and biologic implants are explored.

Ultimately, breast reconstruction plays an important role in the comprehensive management of women with breast cancer. We are now seeing many well-designed, qualitative research projects (such as the many in this very edition) that highlight the importance of breast reconstruction for women with breast cancer. All of the technological advances need to be prefaced on the background of the holistic approach to breast reconstruction. It is now incumbent on us all to carefully analyse whether or not these new techniques actually make a difference, as it will be unethical to just use, and abuse, technology for technologies sake alone. We hope this edition provides the evidence to support current practice, or opens the reader's eyes to new technologies that may make a clinical difference to our patients.

References

1. Nahabedian MY, Facs MD. Innovations and advancements in breast reconstruction. Gland Surg 2015;4:91-2.

Warren Matthew Rozen, MBBS, BMedSc, MD, PhD.



David J. Hunter-Smith, MBBS, MPH, FRACS, FACS.

Warren Matthew Rozen

Guest Editor of this special issue on New Technology in Breast Reconstruction. Monash University Plastic and Reconstructive Surgery Group (Peninsula Clinical School), Peninsula Health, Frankston, Victoria 3199, Australia; Department of Surgery, Monash University, Monash Medical Centre, Clayton, Victoria 3168, Australia. (Email: warrenrozen@hotmail.com.)

David J. Hunter-Smith

Monash University Plastic and Reconstructive Surgery Group (Peninsula Clinical School), Peninsula Health, Frankston, Victoria 3199, Australia; Department of Surgery, Monash University, Monash Medical Centre, Clayton, Victoria 3168, Australia. (Email: dhuntersmith@mac.com.)

doi: 10.3978/j.issn.2227-684X.2015.05.16

Conflicts of Interest: The authors have no conflicts of interest to declare.

View this article at: http://dx.doi.org/10.3978/j.issn.2227-684X.2015.05.16

Cite this article as: Rozen WM, Hunter-Smith DJ. New technology in breast reconstruction. Gland Surg 2016;5(2):86-87. doi: 10.3978/j.issn.2227-684X.2015.05.16