

GUEST EDITORIAL

## Vascular composite tissue transplantation: achievements and challenges in a rapidly developing field

Stefan G. Tullius

---

 Professor of Surgery

Chief, Division of Transplant Surgery,  
 Director, Transplant Surgery Research Laboratory  
 Brigham and Women's Hospital  
 Harvard Medical School, Boston, MA, USA  
 E-mail: stullius@partners.org

Vascular Composite tissue transplantation has evolved like no other field in transplantation during the last 15 years. Indeed, only a few years prior to the success of the early clinical vascular composite tissue transplants, procedures such as face transplantation have not even been considered possible. Today, vascular composite tissue transplants (VCA) are being performed around the world.

From an immunological perspective, skin transplants have traditionally been considered as most immunogenic. Nevertheless, face and hand transplants have had excellent clinical outcomes with immunosuppressive protocols based on the experience in solid organ transplantation.

Chronic graft dysfunction had been absent until recently; however, most recent observations documented graft losses with typical signs of chronic vasculopathy, potentially related to suboptimal immunosuppression.

As in solid organ transplantation, aspects of organ (VCA)-specific immune responses remain debated. Of potential additional interest, VCA transplants like no other graft do not only have a vascular in- and outflow but also a broad surface connecting VCAs to recipient's tissue potentially supporting neovascularization. Will that VCA-specific aspect impact antigen recognition/representation and graft outcome?

With the rising clinical volume comes the necessity for regulations with geographic specificities. Seeing VCAs regulated under the principles of solid organ transplantation is certainly reassuring.

There are many open questions in this rapidly developing field, and one would like to have the opportunity



to look into the future. Will there be less burdensome immunosuppressive protocols or even a tolerogenic approaches for VCA transplants? What will be the overall volume of VCA transplants? Will the field expand to the successful clinical transplantation of other VCA transplants such as lower limbs?

There are currently close to 30 centers in the USA with more than VCA programs. However, at this time, there are only 12 patients listed for VCA transplants and 'only' 10 VCA transplants have been performed during the last 20 months countrywide. Thus, will there be many centers with minimal volumes or will VCA transplantation need to be concentrated in few centers? With many relevant clinical and research questions, funding remains a major obstacle that will need to be resolved to expand the application of VCA.

Many of the issues in the field of VCA appear like a 'blast from the past' of the early days in solid organ transplantation. Certainly, those are very exciting times and it is wonderful to see many new disciplines, clinicians, scientists interested in the challenges, and opportunities in and around (VCA) transplantation.

Appreciative of the opportunity to serve as a guest editor for this special feature edition of 'Transplant International'.