

All vascular closure technologies can fail: Urologists need to be prepared

Kenneth T. Pace, MD, MSc, FRCSC

Division of Urology, St Michael's Hospital, University of Toronto, Toronto, ON, Canada

Cite as: *Can Urol Assoc J* 2017;11(10):325. <http://dx.doi.org/10.5489/cuaj.4931>

See related article on page 321

McGregor and colleagues elegantly present the Canadian experience with vascular closure techniques during donor nephrectomy. While their response rate was 76%, they were able to obtain responses from at least one surgeon at all of the centres in Canada that perform living donor renal transplantation.

While stapling devices represented the most common method for controlling the renal artery and renal vein, titanium clips and plastic locking clips were used by 39% of respondents on the renal artery and 33% on the renal vein.

The most important aspect of the paper, though, is the attention it draws to the fact that all vascular closure devices can fail, and can do so catastrophically. This drives home the importance of a number of points. First, careful technique is vital. Careful dissection around both the renal vein and artery is important during donor nephrectomy, with excellent exposure of both vessels. If a stapler is used, it must be applied fully across the vessel, with care taken to ensure that the vessel is within the stapler markings and that no other structures or clips cross the potential staple line. Using non-bladed staplers is likely the safest stapler approach, since the staple line can be inspected before dividing the vessel and the vessel can be partially transected to ensure complete vascular control. If clips are used, more than one should be applied to the “stay” side and care must be taken to ensure that the clip completely encircles the vessel, that the tips do not “catch” on other tissues (or the vessel itself), and that

the clips do not “cross” one another. For titanium clips, it is important that the tips approximate properly so that they do not “scissor” and lacerate the vessel. When applying clips, it is crucial that the surgeon leave at least 2 mm of tissue intact beyond the clip to minimize the risk of clip “slippage.” Finally, when dividing the vessel after vascular control has been achieved, the vessel should be only partially transected at first (not completely divided), so that if bleeding occurs, the vessel can be grasped and controlled before it retracts.

Urologists also need to be aware that all vascular closure technologies can fail and need to be prepared for when (not if!) they do so. Ready availability of open conversion sets, vascular clamps, and alternative vascular closure devices are all important for these rare, but potentially catastrophic events. In addition, full and informed consent is critical. While operative mortality rates are very low for donor nephrectomy, they are not zero, and all potential living donors (and their recipients) need to be counselled about this small, but measurable risk.

Of course, the lessons learned from donor nephrectomy can be applied to all urological procedures, including radical nephrectomy, “simple” nephrectomy, and adrenalectomy. Careful adherence to surgical technique, particularly around vascular dissection and control, is a critical aspect of all these procedures.

Competing interests: The author reports no competing personal or financial interests.

Correspondence: Dr. Kenneth T. Pace, Division of Urology, St Michael's Hospital, University of Toronto, Toronto, ON, Canada; kenneth.pace@utoronto.ca