

Volumetric changes following partial nephrectomy

Jay D. Raman, MD

Department of Urology, Penn State Milton S. Hershey Medical Center, Hershey, Pennsylvania, USA
Referring to the article published on pp. 7788-7796 in this issue

RAMAN JD. Volumetric changes following partial nephrectomy. *Can J Urol* 2015;22(3):7797.

Technical nuances of partial nephrectomy (PN) remain a continued debate in the urologic literature. Indeed, a number of contemporary studies advocate the use of an early unclamping or a “zero ischemia” technique to manage small renal cortical tumors.¹ These technical approaches have been carried even further to address more complex renal masses including those that are hilar or larger (cT1b) in diameter.^{2,3} The impetus for minimizing ischemia has been to optimize renal preservation and limit the decline of glomerular filtration rate (GFR) following surgery. Nonetheless, challenges and questions are raised when attempting to translate this approach further into general practice. In particular, given that this is a cancer operation, is greater blood loss with poorer visualization really the operative environment that should be translated to the average practicing urologist performing partial nephrectomy? Or perhaps, are there alternative and safer means to achieve kidney preservation that may be feasible for a larger population of urologists to embrace?

The concept of functional renal preservation is one that highlights that optimal kidney function following partial nephrectomy may be predicated on maximizing the volume of residual parenchyma after resection of tumor.⁴ Therefore, the emphasis is less on actual ischemia time but more on precision of resection and effectiveness of reconstruction. The preceding article by Bahler and colleagues is a relatively small series but highlights salient points of consideration in this regard.⁵ Firstly, computed tomography can be a valuable and easily accessible means to determine volumetric renal measurements and estimated GFR following partial nephrectomy. Given the routine use

of CT scanning to assess disease status following PN, the imaging foundation exists to easily and reliably perform these volumetric measurements. Secondly, technical aspects of renorrhaphy may be critical (even more so than ischemia duration) in parenchymal preservation following PN. Specifically, this study suggests that a two layer closure of renal defect results in a greater volume loss with implications of GFR decline when compared to a base layer closure only. This renorrhaphy approach would greatly benefit from further investigation in a larger cohort with a greater number of surgeons.

Ultimately, the goal of kidney tumor surgery is removal of the mass without need for complete nephrectomy when technically feasible. As the size and complexity of these tumors increase, the likelihood of safe and oncologically effective PN decreases in the standard urologist attempting minimal or no ischemia techniques. The emphasis should be on investigation of reconstructive techniques that can preserve renal function whilst providing an operative field that permits reasonable resection. □

References

1. Simone G, Gill IS, Mottrie A et al. Indications, techniques, outcomes, and limitations for minimally ischemic and off-clamp partial nephrectomy: a systematic review of the literature. *Eur Urol* 2015. Epub ahead of print.
2. Salami SS, George AK, Rais-Bahrami S et al. Off-clamp laparoscopic partial nephrectomy for hilar tumors: oncologic and renal function outcomes. *J Endourol* 2014;28(2):191-195.
3. Kreshover JE, Kavoussi LR, Richstone L. Hilar clamping versus off-clamp laparoscopic partial nephrectomy for T1b tumors. *Curr Opin Urol* 2013;23(5):399-402.
4. Simmons MN, Fergany AF, Campbell SC. Effect of parenchymal volume preservation on kidney function after partial nephrectomy. *J Urol* 2011;186(2):405-410.
5. Bahler CD, Kary KC, Garg S et al. Differentiating reconstructive techniques in partial nephrectomy: a propensity score analysis. *Can J Urol* 2015;22(3):7788-7796.

Address correspondence to Dr. Jay D. Raman, Department of Urology, Penn State Milton S. Hershey Medical Center, 500 University Drive, c4830b, Hershey, PA 17036 USA