

Surgery Illustrated – Focus on Details

A novel technique to limit renal warm ischaemia time during laparoscopic partial nephrectomy

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KEYWORDS

partial nephrectomy, surgical technique, warm ischaemia time, Endocatch

INTRODUCTION

Laparoscopic partial nephrectomy (LPN) is now accepted as a minimally invasive treatment option for small favourably located renal tumours [1]. Renal ischaemia is frequently necessary during both open PN (OPN) and LPN to facilitate tumour dissection and renal reconstruction in a bloodless field. In OPN, this can often be

achieved by manual compression, particularly for peripheral tumours. However, this is hard to replicate in the laparoscopic setting, and most surgeons rely on clamping the renal artery(ies) at the level of the hilum.

Similarly, the use of renal cooling to delay the deleterious effects of global ischaemia on acute and long-term renal function is difficult to use effectively, with the result that the most surgeons must 'race against the clock' to complete the surgery within 20–30 min. We describe a technique of compression of the renal parenchyma with a 15-mm Endocatch bag loop during LPN,

which is suitable for removal of small polar renal tumours amenable to LPN, which eliminates the need for global ischaemia times.

SURGICAL STEPS

A standard laparoscopic transperitoneal technique is used. The patient is secured to the table in the 60 ° lateral position with the table slightly flexed. The procedure is done routinely until dissection of renal hilum and clearance of renal pedicle. Full pedicle dissection is not required as the hilum is not clamped and hence there is no global ischaemia time.

Figure 1a and b

A 15-mm Endocatch bag loop, prepared by removing the bag off the loop but leaving the plastic sleeve intact over the Endocatch loop. It is introduced through a 15-mm suprapubic port, which provides the best angle for placement of the Endocatch loop.

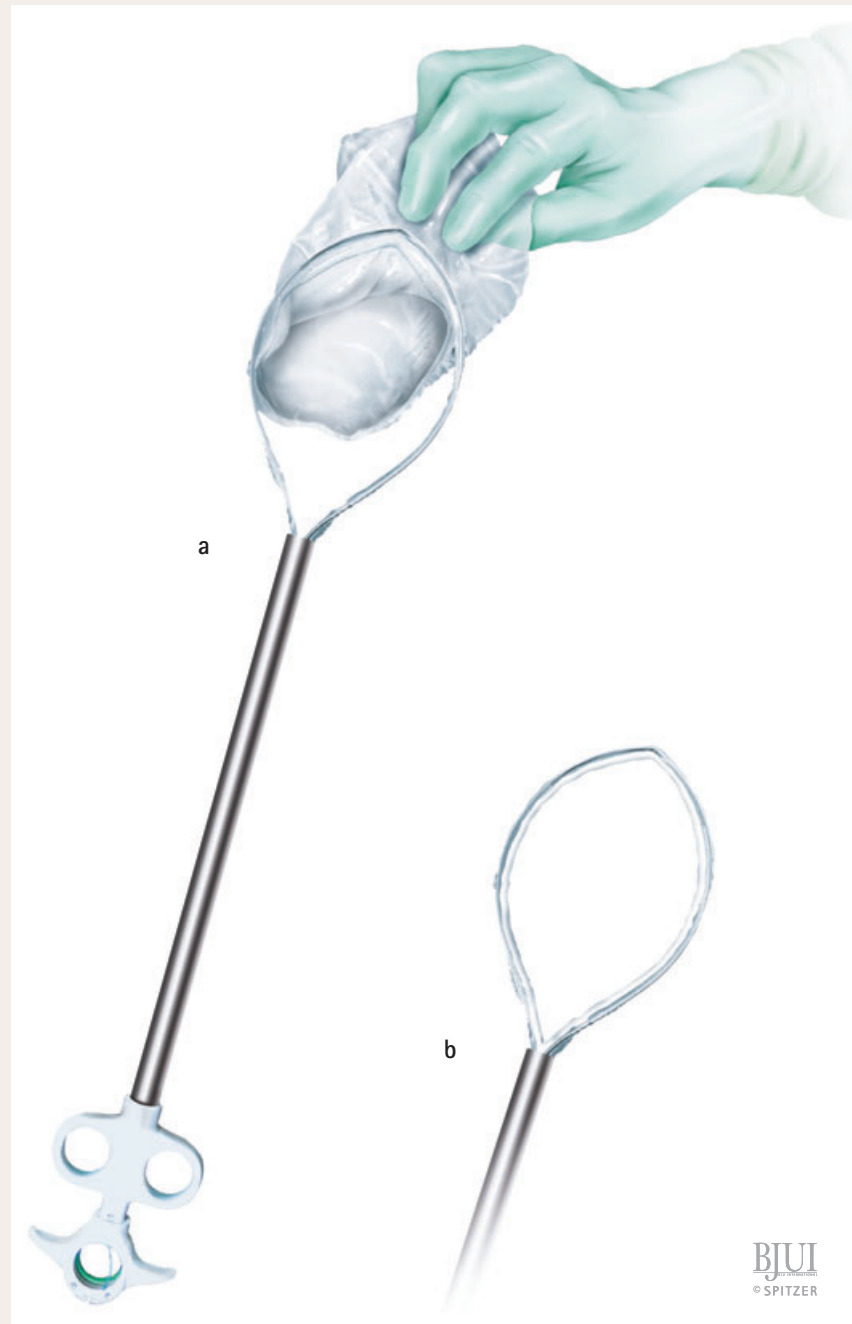
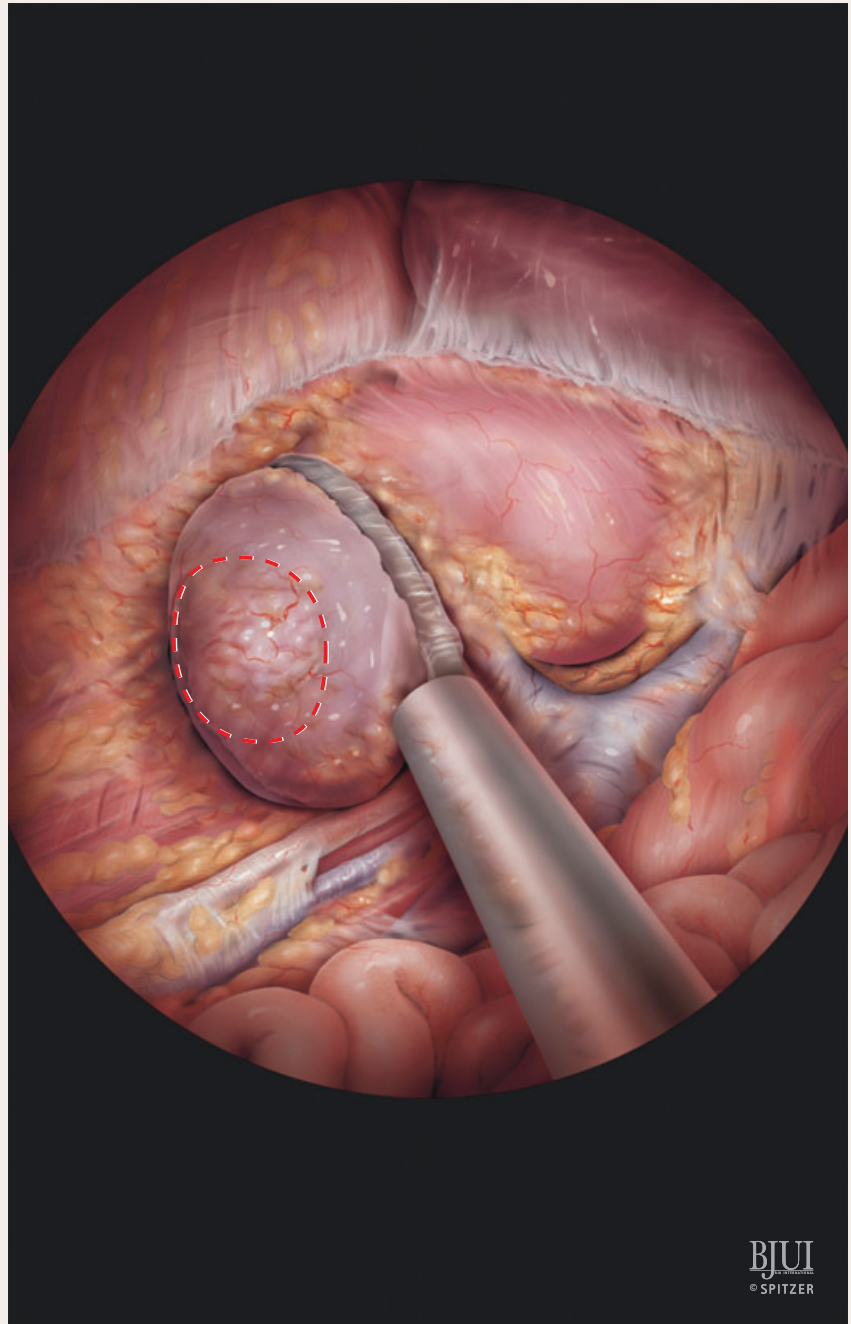


Figure 2

The pole is compressed and the tumour is excised with a 1-cm margin with cold scissors. The Agarwal Hem-o-lok sliding technique of renal defect closure, which has been previously described [2], is used to close the renal defect and compression is released. The surgical field is carefully checked for bleeding and the specimen is retrieved in an Endocatch bag. A drain is inserted in the renal bed.



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DISCUSSION

LPN is now the procedure of choice for renal tumours of < 4 cm [1]. However, it remains a challenging procedure reserved for experienced laparoscopists, limited mainly by the ability to achieve haemostasis and closure in an acceptable time frame. A recent series showed 'no-ischaemia' LPN decreased the deleterious effects of any warm ischaemia on renal function during standard LPN [3]. Various techniques have been used to reduce warm ischaemia time during LPN, including eliminating knot tying during warm ischaemia time [4], earlier arterial unclamping after one or two running sutures on the tumour bed [5] and robotic approaches.

The authors feel this technique offers significant advantages mainly in the form of no global warm ischaemia time. The use of a renal parenchymal clamp (B. Braun Aesculap) has been reported by Verhoest *et al.* [6] to achieve similar effects with elimination of warm ischaemia times. The authors have previously used this clamp without much success. The recently

developed Karl Storz Kidney Clamp now offers similar advantages to our technique described here. However, this clamp is thin and may not be strong enough for renal parenchymal compression.

We have now used this technique for two patients, both having 1–2 cm polar tumours. Histology showed clear cell carcinomas in both cases. A limitation of this technique is that it is useful only for small polar tumours, hence is not suitable for all LPN cases.

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Abbreviation: (L)(O)PN, (laparoscopic) (open) partial nephrectomy.