Video Article

DOI: 10.4274/uob.galenos.2020.1739.video

Bull Urooncol 2020;18:96-97

Laparoscopic Partial Nephrectomy: Tips and Tricks

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Introduction

Partial nephrectomy (PN) should be recommended for clinically stage T1 or "resectable" T2 tumors rather than radical nephrectomy if technically feasible. Technical preference for PN depends on the expertise of the surgeon (1). In experienced hands, laparoscopic partial nephrectomy (LPN) indeed works as an effective nephron preserving platform despite a more difficult learning curve (2). In this video article, we aim to present LPN's technical details and tips on all steps.

Approach, Patient Positioning and Trocar Setup

We mostly prefer the transperitoneal approach, as it provides a wider area during operation and easier anatomical orientation. We use a modified lateral decubitus position, which helps in colon medialization by allowing the intestines to fall away from the kidney. We use the closed technique to create pneumoperitoneum. The optic trocar is usually placed into the pararectal line or umbilicus according to the anatomical features of the patient. The location of other trocars is detailed in the video.

Vascular and Perirenal Dissection

First, by cutting the Toldt's line and lienorenal and triangular ligaments, mobilizing the colon, liver, and spleen is a part of this stage. The duodenum is medialized with the Kocher maneuver after mobilization. Following medialization, Gerota's fascia is incised over the gonadal vein and Gerota's fascia is dissected to the inferior border of the renal vein and the lower pole is suspended. The plane between the kidney and adrenal gland may be freed to help facilitate mobilization. The renal vein and artery are dissected separately and secured with silicon tapes. The use of intraoperative ultrasound (IU) may guide to proper parenchymal dissection, prevention of tumor capsule breach and defining margins. We use ultrasonic energy devices such as Thunderbeat® for perirenal dissection and margin of the tumor is scored by hook cautery. The use of IU in endophytic masses is essential to perform PN.

Resection and Renorraphy

After preparations, we insert endo-bulldog clamps separately into the artery and vein. To avoid tumor capsule breach and to develop the crater, the tumor is resected with cold scissors, tips pointing outwards. The surgeon uses the suction to keep the resection field bloodless and the assistant creates space by retracting the kidney. Obvious arteries in tumor bed can be controlled with metal or Hem-o-lok™ clips. The renorraphy is performed in two phases; in the first step, we prefer 2/0 V-loc™ or monocryl sutures with a Hem-o-lok™ clip in the end. In the second step, we use 2/0 absorbable, braided suture with sliding clip technique (3). Bulldog clamps are released after renorraphy, by aligning the clamp's base with the bulldog remover. For hemostasis, visual inspection of the resection site is done by reducing the pressure to 5 mm Hg. The specimen is placed into endobag via the working port. Finally, the Gerota's fascia is closed with a 2/0 absorbable suture, paying attention to the ureter. We remove the specimen from the separate Gibson incision if the patient is not morbidly obese.

Conclusion

Minimally invasive PN is one of the most demanding procedure in urology practice and it can be used even in complex cases safely and efficiently with experience.

Acknowledgements

Publication: The results of the study were not published in full or in part in form of abstracts.

Contribution: There is not any contributors who may not be listed as authors.

Conflict of Interest: No conflict of interest was declared by the authors.

Cite this article as: Gülşen M, Özden E, Yakupoğlu YM. Laparoscopic Partial Nephrectomy: Tips and Tricks. Bull Urooncol 2020;18:96-97

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Received: 12.05.2020 **Accepted:** 18.05.2020

Financial Disclosure: The authors declared that this study received no financial support.

Ethics

Informed Consent: Patient approval was obtained.

Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Concept: M.G., E.Ö., Y.K.Y., Design: M.G., E.Ö., Y.K.Y., Data Collection or Processing: M.G., E.Ö., Analysis or Interpretation: M.G., E.Ö., Literature Search: M.G., Writing: M.G.

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