

Mini-Laparoscopic Donor Nephrectomy

A Novel Technique

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INTRODUCTION

Randomized studies have proved the safety and efficacy of laparoscopic donor nephrectomy (LDN)^(1,2) and now it is performed in the most major transplant centers for donor nephrectomy. Further attempts are made to make this minimally invasive technique more acceptable for donors by introducing transumbilical and pfannenstiel laparoendoscopic single site surgery (LESS) nephrectomy.^(3,4) We report for the first time a technique for donor nephrectomy not only more cosmetic comparing to standard laparoscopy (SL), but also more ergonomic and user-friendly than LESS technique.

TECHNIQUE

A 27-year-old man underwent general anesthesia in flank position for left LDN. The first trocar was placed by transumbilical approach, which was used to introduce standard 0 degree videoscope. Two 3.5-mm trocars were placed above and lateral to the umbilicus and were used for grasping and scissoring, respectively. A 10-mm trocar with 5 mm reducer was placed through fascia from a 5-cm pfannenstiel incision, which would be used for the kidney extraction (Figure 1). This trocar was used for suctioning, traction, and bipolar coagulation for the adrenal and lumbar veins during nephrectomy. Vascular clips for controlling the renal pedicle were also introduced through this trocar. Laparoscopic nephrectomy was

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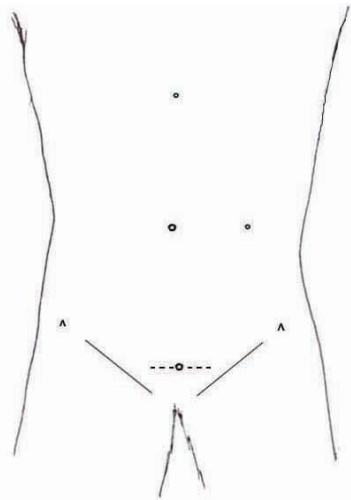


Figure 1. Two 3.5-mm trocars were placed above and lateral to the umbilicus and a 10-mm trocar with 5 mm reducer was fixed through the fascia from a 5-cm pfannenstiell incision, which would be used for the kidney extraction.

performed as we reported in detail previously.⁽¹⁾ The colon was mobilized medially and the spleno-renal ligament was divided. The left ureter together with the gonadal vein was freed from surrounding tissues while preserving peri-ureteral tissue. The renal vein was dissected distal to the gonadal vein by bipolar coagulation and division of the lumbar veins and adrenal vein (Figure 2). Renal artery was exposed after the lumbar veins were divided. The rest of the kidney was dissected free from surrounding tissues as we do in LDN. A transverse incision was made lateral to suprapubic trocar and the rectus muscles were separated from each other without opening the peritoneum. The renal artery and vein and the ureter were clipped through suprapubic trocar using Hem-o-lok clip applicator and titanium clip applicator. The renal artery and vein and the ureter were divided and the kidney was hand extracted.

RESULTS

Mini-laparoscopic donor nephrectomy (MLDN) was successfully performed in a 27-year-old male donor using 3-mm instrument. His body mass index was 18.5 kg/m². Operation time was 135 minutes with a warm ischemia of 5 minutes. Pain score

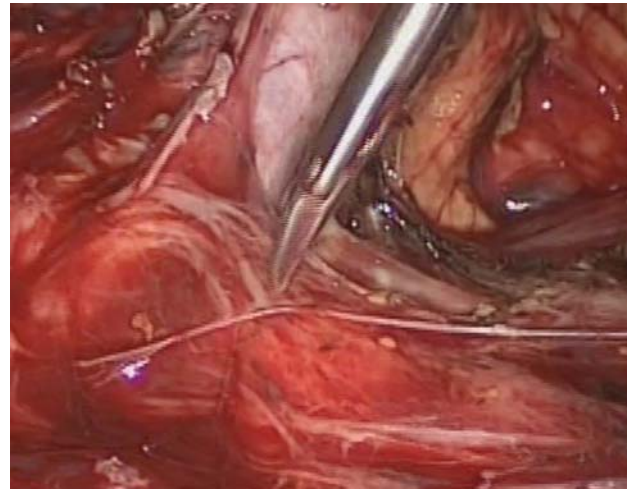


Figure 2. Renal vein was freed from surrounding tissues using mini-laparoscopic scissors.

was zero at discharge and the patient left hospital in 36 hours (less than 2 days). No peri-operative complications occurred. Harvested kidney started diuresis immediately post transplant and nadir serum level of creatinine was 0.8 mg/dL.

DISCUSSION

Laparoscopic donor nephrectomy has encouraged donors for the kidney donation. Randomized and large retrospective studies have shown that LDN has similar graft outcome in recipients while has less morbidity in donors.^(1,5) Recently, LDN has become the standard of care for donor nephrectomy in the most major transplant centers around the world.

Several attempts have been made to make LDN less invasive and new modifications, such as transumbilical and Pfannenstiel LESS, have been introduced in this regard. Gill and colleagues reported the first LESS donor nephrectomy transumbilically (E-NOTES) in 4 patients.⁽³⁾ Kurien and associates compared SL donor nephrectomy versus transumbilical LESS in a randomized comparative study and finally concluded that LESS has comparable graft function, shorter hospital stay, and longer warm ischemia time ($P < .0001$). They emphasized

that LESS donor nephrectomy is challenging even for expert SL surgeons.⁽⁶⁾ Andonian and their colleagues performed LESS Pfannenstiel donor nephrectomy in 6 patients with acceptable results and median warm ischemia time of 5 minutes.⁽⁴⁾ Thereafter, they compared the initial 6 LESS donor nephrectomies with 6 cases matched SL in the other study. Final results were similar in both groups and the only advantage of LESS in comparison with SL was better cosmetic appearance.⁽⁷⁾

Both of these techniques have some limitations: Laparoendoscopic single site surgery technique is not ergonomic, requires new training and expertise, and adds difficulties for the surgeons and their assistants. Another limitation is the lack of triangulation and rolls over of the instruments both inside and outside the peritoneal cavity, which makes working very hard for the surgeon and assistant. In the afore-mentioned techniques, the surgeons have used new flexible videoscope and instruments not routinely used in SL techniques, which adds to the cost of procedure in addition to deep learning curve for using these unfamiliar instruments.

Novitsky and colleagues revealed that mini-laparoscopic cholecystectomy is concomitant with less pain and shorter hospital stay and recovery time comparing to SL.⁽⁸⁾

In our technique, there is more similarity to SL; hence, surgeons perform the procedure more comfortably and no new videoscope is needed while achieving excellent cosmetic results. Likewise, working instruments are regular pediatric and adult instruments already used in SL operating rooms. Mini incision in this approach requires no suturing and final scars will be invisible.

CONCLUSION

Mini-laparoscopic donor nephrectomy offers the benefit of improved cosmetic comparing to SL donor nephrectomy while being more ergonomic and more comfortable for laparoscopic surgeons doing LDN. Randomized clinical trials are needed to

compare MLDN and SLDN.

CONFLICT OF INTEREST

None declared.

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