

## CASE REPORT

# Back Door Style: A Case Report on Retroperitoneoscopic Donor Nephrectomy - A First in the Philippines

Raul Carlo C. Andutan, MD; Juvido P. Agatep Jr., MD, FPUA and Mark Jason Y. Dequina, MD

*Department of Urology, East Avenue Medical Center*

The aim of this report is to validate the effectiveness and safety of the retroperitoneoscopic donor nephrectomy in kidney transplantation and to document the first Retroperitoneoscopic Left Donor Nephrectomy in the Philippines done last July 5, 2018.

This is a case of 35-year-old female with no comorbidities but with an infraumbilical scar from a previous cesarean section underwent the first Retroperitoneoscopic Left Donor Nephrectomy in the Philippines.

The principle was pure retroperitoneoscopic donor nephrectomy, hand-assist using Gelport device was applied only during vascular transection and allograft retrieval. Access to the retroperitoneum was established using a modified trocar placement.

Retroperitoneal Donor Nephrectomy is a safe and technically-feasible surgery as more urologists become proficient with this approach. The benefits of this approach are in line with the goals of living kidney allograft retrieval, to minimize morbidity and to maximize safety of the patient. Literature shows that it has comparable outcomes with Transperitoneal donor nephrectomy (TDN) and open traditional allograft kidney retrieval.

**Keywords:** Retroperitoneal donor nephrectomy (RDN), living donor nephrectomy (LDN), Transperitoneal donor nephrectomy (TDN) Gelport

Retroperitoneoscopic Donor Nephrectomy was introduced by Yang in 1995. This approach involves access and retrieval of the kidney without violating the peritoneum. In Western countries, several modifications have been developed from the standard transperitoneal laparoscopic approach including hand-assisted transperitoneal laparoscopic, total retroperitoneoscopic, hand-assisted retroperitoneoscopic, laparoendoscopic single site (LESS) and the natural orifice (NOTES) approach. In the Philippines, transperitoneal laparoscopic approach is more commonly used over the retroperitoneoscopic approach for renal and adrenal surgery due to its better learning curve and operating space.

Kidney transplantation is the ideal treatment of choice for patients with End Stage Renal Disease. In the Philippines, there is a growing rate of ESRD from 35.2 patients per million populations in year 2000 to 136.2 PPMP in 2013. In a third world country where most Filipinos personally pay for their medical expenses, kidney transplantation rate has been stagnant at 3.4 PPMP since 2000 despite the increasing number of ESRD candidates for transplantation.

Laparoscopic Live Donor Nephrectomy is the standard of care in Western countries for the recovery of kidney allograft due to its low complication and morbidity rate. Less pain, less hospital stay, early ambulation and early return to

daily activities are the main reasons why it has surpassed the open approach. In the Philippines, approximately 94% of kidney transplantation comes from living donors and most are non-related donors (70.1%).<sup>1</sup> The first locally reported Transperitoneal Laparoscopic Donor Nephrectomy with hand assist was done at NKTI on February 24, 2004.<sup>2</sup> This started a trend towards a minimally invasive route in harvesting kidneys for transplantation. The goal of a good donor surgery is to deliver a safe, least painful and least disruptive operation in harvesting a viable graft with good function.

A recent metanalysis by Özdemir-van Brunschot composed of several cohort studies revealed that significantly fewer complications were seen in the retroperitoneoscopic group as compared to the transperitoneal group. Operation and warm ischemia times were reduced when using hand-assistance.<sup>3</sup> In a study by Arai et al, retroperitoneoscopic approach is associated with less incidence of postoperative ileus.<sup>4</sup> The HARP trial by Leonienke revealed that the retroperitoneoscopic approach had a very small chance of having complications to the intestines and hand assistance was also beneficial for the control of bleeders.<sup>5</sup> Another surgical advantage

of the retroperitoneal approach is the direct access to the hilum and vessels. Both have their own specific advantages but as to date, there are limited data supporting the superiority of one technique over the other.

## The Case

Presented here is a case of a 35-year-old female with no comorbidities but has an infraumbilical scar from a previous cesarean section. Donor selection and pre-operative evaluation were done in coordination with a nephrologist. All blood parameters were within normal limits. Whole abdominal CT-scan with IV was done to evaluate the anatomy of the kidneys. To further evaluate the vasculature of the kidneys, a CT-angiography was done revealing each kidneys being supplied by a single artery and single draining vein (Figure 1.1). The length of the left renal artery is 4.9 cm while the right is 5.9 cm. The left vein is 7.7 cm while the right renal vein is 4.6 cm on CT-angiography. GFR scan revealed 119.7 ml/min, 58.4 ml/min on the left and 61.3 ml/min on the right (Figure 1.2).

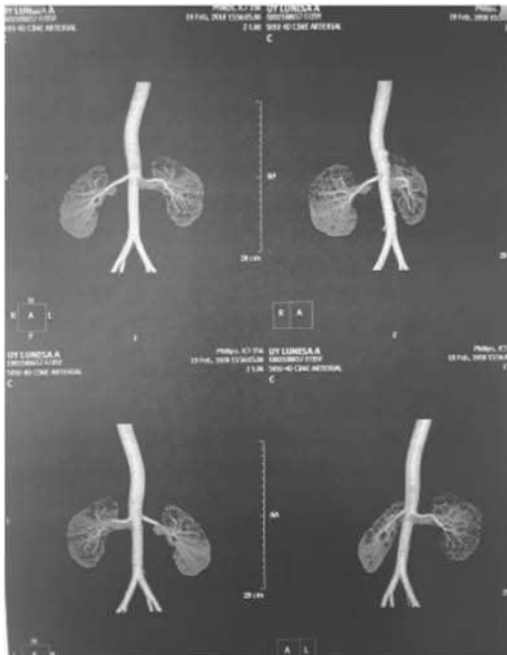


Figure 1.1. CT - angiography

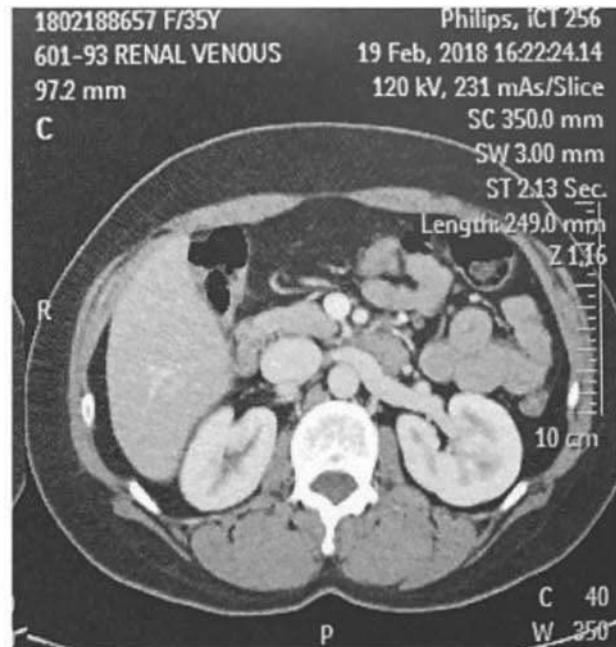


Figure 1.2. CT - scan venous phase

### Surgical Procedure

After general anesthesia induction, thromboembolic stockings and jelly paddings were placed on pressure points. The patient was then placed on a right lateral decubitus position with the body flexed at a right angle to the table. This angulation facilitated optimum port placement by increasing the distance between the 12th rib and the iliac crest. (Figure 2) Modified kidney and axillary rolls were placed to widen the operative site and to protect the right brachial plexus. The patient was fixed to the backrest and table using a velcro strap.

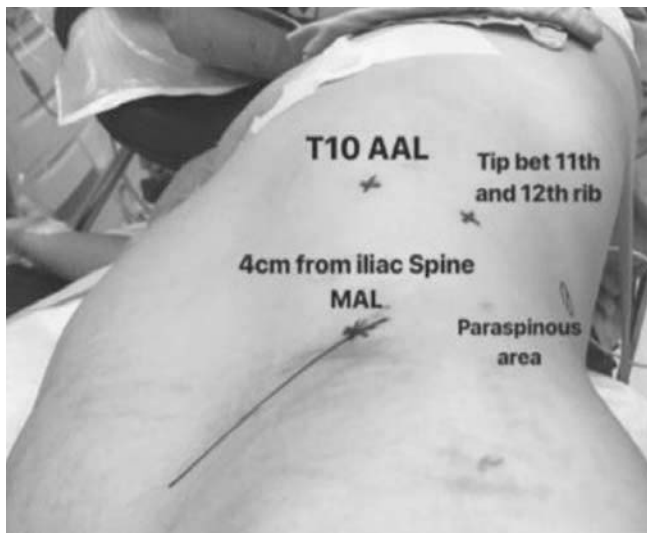


Figure 2. Port placement (Side View)

An initial skin 2cm incision on the paraspinous area was done to facilitate access to the retroperitoneum. Kelly clamp was then used to puncture the thoracolumbar fascia and split the muscle fibers. The index finger was inserted to palpate the psoas muscle and gerotas fascia to confirm access to the retroperitoneum. A lubricated scope guided balloon dilator was then introduced and inflated directed cephalad and caudad to push the kidney anteriorly to create a working space. A 10mm port was inserted for the camera and insufflation was started. Pneumoretroperitoneum pressure was maintained at 12mmHg with flow rate of 35mmHg.

### Trocar Placement

After balloon dilation, modified port placement using a 10mm port was inserted at the tip between the 11th and 12th rib with direct vision followed by a 5mm port inserted on the t10 level at the left anterior axillary line and a 3rd 5mm port was placed approximately 4cm from the iliac spine at the mid axillary line level.

### Surgical Procedure

Once access was established, dissection of the gerota's fascia using endodissector was commenced. Mobilization of the kidney using blunt dissection and ligasure followed. Pure retroperitoneoscopic principle was used to identify, isolate and dissect the renal, adrenal and gonadal and lumbar vessels and ureter. Left renal vein in particular was mobilized and dissected as proximal as possible to the IVC. The lumbar, adrenal and gonadal veins were identified. All these small draining veins were clipped with hem-o-lok and transected. The renal artery was mobilized and dissected up to the root of aorta. The distal ureter was dissected and isolated just below the level of the iliac vessels.

Once the vessels and ureter were secured, Gelport device was then applied. (Figure 3) GelPort system is a wound-sealing device that allows access of the hand to the surgical field while preserving the pneumoretroperitoneum. Clamping of the renal vessels and ureter with hem-o-lok and titanium clips ensued and the kidney was delivered through the device with a warm ischemia time of 2 minutes and 50 seconds.

Total operative time was 2 hours and 30 minutes with an estimated blood loss of less than 100ml. No intraoperative complications were noted. Immediately after transplantation, there was urine output. No hematoma was seen on the kidney allograft. Postoperative course was unremarkable. Patient was put into full diet once fully awake. No postoperative ileus and only minimal pain was noted. She was discharged on the 3rd postoperative day with creatinine of 1mg/dl.



Figure 3. Application of Gelpport device

## Discussion

Ratner, et al. were the first to perform laparoscopic donor nephrectomy (LDN) in 1995.<sup>6</sup> Subsequently, Yang, et al. performed the first assisted retroperitoneal endoscopic live donor nephrectomy in 1995.<sup>7</sup>

In the Philippines, Gregorio, et al. described the first transperitoneal laparoscopic donor nephrectomy (hand-assisted) done at NKTi on February 24, 2004.<sup>2</sup> This started the trend towards a minimally invasive approach for kidney allograft retrieval in the country. Several centers in the Philippines offer TDN but to my knowledge, RDN has yet to be done.

On June 5, 2018, Dr. Juvido Agatep and the surgical team performed the first retroperitoneal donor nephrectomy in the Philippines. The principle for kidney dissection and isolation was pure retroperitoneoscopic. Hand-assist using the Gelpport device was done only during vascular transection and allograft retrieval. The technique used is safe and feasible for an experienced and proficient surgeon of the retroperitoneal approach. This approach can potentially lead to lesser pain, shorter hospital stay and lesser hospital cost.

## Conclusion

Retroperitoneal donor nephrectomy is a safe and technically feasible surgery as more urologists become proficient with this approach. The benefits of this approach are in line with the goals of living kidney allograft retrieval, to minimize morbidity and to maximize safety of the patient.

## References

1. Chan-on C, Sarwal M. A comprehensive analysis of the current status and unmet needs in kidney transplantation in Southeast Asia. June 2017. p.8.
2. Gregorio MRS, et al. Living donor nephrectomy at the National Kidney and Transplant Institute: surgical techniques, perioperative complications and outcomes. 2017; 4-5.
3. Özdemir-van Brunschot D, et al. A comparison of technique modifications in laparoscopic donor nephrectomy: A systematic review and meta-analysis.
4. Arai Kei, et al. Retroperitoneoscopic donor nephrectomy with a gel-sealed hand-assist access device. 2013; 2.
5. Rocca, et al. Live donor nephrectomy. Mount Sinai J Med 2012; 330-41.
6. Ratner le, et al. Laparoscopic live donor nephrectomy. Transplantation 1995; 60: 1047-9.
7. Yang SC, et al. Retroperitoneal endoscopic live donor nephrectomy: report of 3 cases. J Urol 1995; 153: 1884-6. [PubMed]