LAPAROSCOPIC LIVE DONOR NEPHRECTOMY

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BACKGROUND

• Kavoussi and colleagues performed the first laparoscopic donor nephrectomy in 1995.

• After 6 years the United Network for Organ Sharing announced that the number of living donation procedures performed in the United States during 2001 equaled the number of cadaver donations for the first time.

ADVANTAGES

• Decreased hospital stay and convalescence

• Less pain and greater patient acceptance

• Better quality of life

• No increased risk to the donor, graft or recipient compared to the standard open procedure

TESTS

• Routine blood tests

• Electrocardiogram (EKG), chest X-ray, urinalysis

• 4 phase spiral CT scan with 3D CT angiogram

• Psychological evaluation

• Nephrologic evaluation
Utility of 16-MDCT Angiography for Comprehensive Preoperative Vascular Evaluation of Laparoscopic Renal Donors

AJR:186, June 2006

Left aberrant renal venous branch (black arrow) connecting with large gonadal vein (white arrow)

1-mm accessory renal artery (arrow)
Two retro-aortic left renal veins (*arrows*)

Single left renal artery with very early branches as two capsular arteries (*arrow*)

Large lumbar vein (*white arrowhead*)

Small retroaortic renal vein (*arrow*)
CONTRAINDICATIONS
(Absolute/Relative)

- Bleeding disorders
- Recurrent urinary infections
- Malignancy
- Kidney stone disease
- Multiple prior abdominal surgeries
- Obesity

LEFT OR RIGHT LLDN?

- The results confirm that there is no difference between the two procedures
- Early concerns about high thrombosis rates are not supported by a multi-institutional review of laparoscopic right donor nephrectomies

MULTIPLE ARTERIES?

- With meticulous procurement and reconstructive transplantation techniques, the presence of multiple renal arteries (>1) in laparoscopic donor nephrectomy does not have a significant impact on the outcomes of the renal donors or recipients

Hsu TH, Kavoussi LR. Urology. 2003 Feb;61(2):323-7

Multiple Arteries at UCLA

- Arterial Evaluation
  - 2L vs 1R
  - 1R vs 3L
  - +/- upper pole capsular artery (<1 mm)

- Venous Evaluation (most variations acceptable)
  - Retroaortic
  - Circumaortic
  - Late confluence
  - Multiple veins

PREPARATION FOR LAP SURGERY AT UCLA

- 2 DAYS BEFORE SURGERY
  - CLEAR LIQUID DIET

- 1 BOTTLE OF MAGNESIUM CITRATE (150 ML) A DAY BEFORE SURGERY

- 1 FLEETS ENEMA THE NIGHT BEFORE

- NPO AFTER MIDNIGHT

SURGICAL TECHNIQUE

1) Patient positioning and trocar placement
2) Medial reflection of colon
3) Reflection the spleen and mobilization the upper pole

(Previously discussed)
**STEPS OF THE OPERATION**

1) Identification of the ureter and gonadal vein  
2) Dissection, ligation, and transection of the gonadal vein (just distal to the renal vein)  
3) Dissection of the ureter off the gonadal vein (drop medial) to the level of iliac vessels

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**UCLA EXPERIENCE**

- Between 2000-2005, 300 LLDN  
- 167 females and 133 males  
- Mean age 37.6 (18-68)  
- Mean operative time 180 ± 55 min

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**COMPLICATIONS**

- Overall complication rate: 4%  
- Intraoperative major complications: 0.6%  
  - Endovascular staple malfunction  
  - Veress needle injury to the left common iliac artery  
- Postoperative major complications: 1%  
  - 2 Chylous ascites  
  - 1 Rhabdomyolysis  
- Postoperative minor complications: 2.3%  
  - 4 Paralytic ileus  
  - 2 Epididymitis  
  - 1 Subcutaneous hematoma

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Breda A. et al Urology 2007
HOSPITAL STAY AT UCLA

- Preoperative preparation
  - Clear liquid diet 2 days before surgery
  - 1 bottle of magnesium citrate 150 mL PO the day before surgery
  - NPO after midnight before surgery

- Immediate postoperative care
  - Ketorolac 30 mg intravenously every 6 hours for a maximum of 48 hours
  - Additional narcotics if necessary for analgesia

- First day postop
  - Clear liquid diet for breakfast
  - Regular diet for lunch

Mean donor hospital stay: 1.1 days

Breda A. et al Urology 2007

FOLLOW-UP

- Postoperative clinic visit after one or two weeks

- Clinic visit annually by the primary doctor

INCIDENCE OF URETERAL STRICTURES AFTER LAPAROSCOPIC DONOR NEPHRECTOMY

- Preservation of the gonadal vein is essential for the prevention of ureteral strictures


INCIDENCE OF URETERAL STRICTURES AFTER LAPAROSCOPIC DONOR NEPHRECTOMY

- Gonadal vein isolated and transected just distal to the renal vein

- Average F.U. 2 years

- Over 300 pts. no ureteral strictures or urine leak in the recipient

Breda A. et al J Urol 2004
The gonadal vein is isolated and transected just distal to the renal vein.

Advantages:
- Dissection of the ureter
- Elevation
- Access to lumbar vein

CONCLUSIONS

- The intraoperative and postoperative complications for LLDN are low
- LLDN is a safe procedure associated with low morbidity

IS LLDN THE NEW STANDARD OF CARE?

YES


CONCLUSIONS

- Gonadal vein preservation during laparoscopic donor nephrectomy is not necessary
- Preservation of the peri-ureteral blood supply is sufficient to prevent ureteral strictures and/or urine leak in the recipient
- With current data LLDN has become the standard of care for kidney donation
THANK YOU