ID 11 3DLAPAROSCOPIC DONOR NEPHRECTOMY VS TRANSVAGINAL RETRIEVAL OF DONOR KIDNEY – TECHNIQUES AND OUT COMES

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INTRODUCTION:

Laparoscopic living donor nephrectomy (LDN) has been widely accepted as gold standard for renal donation.(ref1) LDN has reduced the donor morbidity and helped to increase the living donation rate. (ref2) To further decrease the post operative pain and discomfort laparoendoscopic single site surgery (LESS) was developed. But in LESS 5-6 cms incision in linea alba is required. (ref 3) With the increase in laparoscopic experience and new instruments natural orifice vagina has been used to retrieve the donor kidney in selected females called trans vaginal natural orifice assisted laparoscopic donor nephrectomy (TVNALDN).In this paper we share our technique of TVNALDN and compare the out comes with those of conventional LDN in terms of feasibility and reproducibility.

METHODS:

A total of 200 female patients had undergone donor nephrectomy surgery· Among them 40 underwent TVNALDN and rest standard LDN at Malabar institute of medical sciences, Calicut, Kerala, India between Dec. 1st 2013 to March 1st 2015. It is a retrospective study. Females with at least one vaginal delivery were considered for the procedure. Patients with history of difficult labour, caesarian surgery & hysterectomy were excluded. Written informed consent was obtained after detailed explanation of procedure. All these patients were examined by gynecologist and got approval for the procedure . Renal function and glomerular filtration rate (GFR) were measured with nuclear perfusion scan. All abdominal organs were studied with ultrasonography. Computed Tomography angiography was used to examine renal vascular anatomy. All cases of TVNALDN were left sided and eleven cases were having multiple arteries. The operation was performed by single surgeon with experience of assisting more than 400 LDN and performing more than 200 LDN.

PREOPERATIVE PREPERATION:

In TVNALDN patients vaginal sterility is ensured with vaginal swab culture prior to selection. Betadine vaginal pessary is kept for consecutive three nights prior to the surgery. All cases were given bowel preparation with poly ethylene glycol 12hrs prior to the surgery. Prophylactic antibiotics with third generation cephalosporin is given after test dose one hour prior to the skin incision.

OPERATIVE TECHNIQUES:

Aesculap 3D Eienstein vision system was used. After induction of anesthesia Foley catheter was placed. Lateral decubitus position is given and in TVNALDN legs seperated position was given to allow vaginal access. The abdomen, external genitalia, vagina was prepared with povidone-iodine

solution and included in the draping. Transperitoneal approach was used. First 10mm port was placed by open method 4cm lateral and above the umbilicus at the lateral border of rectus muscle. Subsequent working ports are placed under vision creating a pneumoperitoneum of 15 mmHg. The first working port (10mm) was placed just below the 12th rib at mid-clavicular line. Second working port (10mm) at the midpoint of spino-umbilical line. 5mm retractor port at the anterior axillary line corresponding to the lower pole of the kidney. Camera was interchanged through the 10 mm ports so that kidney was dissected in various convenient angles. The upper pole and adrenal dissection were carried out with camera in the upper port. Hilar dissection was carried out with camera in the middle port. Posterior dissection and hilar vessel clipping with camera in the lower most port. 3D laparoscopic view was very helpful in delineating the anatomy especially the vascular and lymphatics very clearly. After port placement, incision made along Told's line &. colon mobilized medially moving away from the kidney using harmonic scalpel. The ureter was identified and traced to the level of iliac vessel crossing. Care was taken to preserve the tunica adventitia and not to jeopardize the ureter vascularity. The Gerota's fascia was opened and renal parenchyma exposed. The gonadal, lumbar,adrenal branches were exposed at the points where they joined the renal vein and divided between the clips. The renal artery was cautiously dissected to the aortic root for maximum length. Adrenal gland was separated with harmonic dissection. Kidney was mobilized all around except over a small area in the upper pole which remained attached to abdomen wall to prevent torsion. In LDN 8-10cm suprapubic incision was placed and incision deepened to cut the rectus sheath. Peritoneum is kept intact and 5mm trocar for bowel retraction was placed through it. In TVNALDN patients, a colpotomy compatible with kidney size was created through the posterior fornix, and indigenously made endocatch bag was introduced. Pneumoperitoneum was maintained by preventing the air leak around the tube by tight sponge wrapping. The ureter was clipped and divided at the iliac vessel crossing level and good urine out put ensured before hilar vessel clamping. Renal artery was secured 2 hem-o-lok clips applied close to the aotra and cut with cold scissors and followed by renal vein clipping (2 hem-o-lok) and divided. In LDN cases peritoneum was opened with the suprapubic incision and kidney was manually retrieved under camera vision placed through the upper most port. Kidney is placed in ice slush and cooled with HTK solution. In TVNALDN kidney was placed in the endocatch bag after ureter division. Hilar vessels were secured with hem-o-lok clips and divided. Kidney in the endocatch bag was pulled out through the colpotomy tube in the vagina by the second surgeon. The main operating surgeon maintained the longitudinal lie of the kidney while kidney was pull out. Once the endocatch bag is out it is opened by nurse and perfusionist takes out the kidney to prevent any possible contamination. After the closure of peritoneum in the LDN and colpotomy wound in the TVNALDN, the abdomen is re-insufflated haemostasis is ensured, peritoneal toileting followed by drain insertion. Ports and wound closed in layers.

POST OPERATIVE CARE:

All the patients were managed in ICU in day zero of surgery. Patients were allowed to drink clear

liquids by evening and light break fast next day morning. Intravenous fluids were maintained for 36hrs. Paient controlled analgesia with acetaminophen was used. In some cases of LDN TRAMADOL was used where there was no relief with acetaminophen. None of the TVNALDN required opiod analgesics. Vaginal pack and Foley catheter was removed at 24 hrs.

STATISTICS:

The two group comparison for variables were performed by use of student T or Mann-whitney U test. For comparison of the ratio for categorical variables, chi-square test was used. Data expressed as mean (standard deviation), minimum, maximum and percent where appropriate. The level of statistical significance was set at $p<0.05$.

RESULTS:

Donor Characteristics

A total of 40 patients who underwent TVNALDN and 160 patients who underwent standard LDN(SLDN) were included in the study.

There was no significant differences between SLDN and TVNALDN donors in terms of mean values for age, body mass index and post-operative serum creatinine level as well as percent of obesity and history of abdominal surgery. All TVNALDN patients underwent left sided nephrectomy.

Donor and Receiver Characteristics in Laparoscopic Versus Transvaginal Nephrectomy Groups

	SLDN	(n=160)	TVNALDN	(n=40)	p value
	Mean±SD	**n**	**Mean±SD**	**n**	
Donor Characteristics					
Age (yrs)	48.2 ± 12.2		46.9± 11		0.559
BMI(kg/m2)	30.5±5.2		30.3±4.1		0.998
Post op creatinine	0.96±0.21		0.97± 0.12		0.079
Obesity(BMI>30)		68(42.5%)		12(30.0%)	0.15
Right nephrectomy		15		0	
Left nephrectomy		145		40	
H/o abdominal Surg		47(29.3%)		9(22.5%)	0.39
Receiver Characteristics					
Male		117(73.1%)		31(77.5%)	0.57
Female		43(26.9%)		9(22.5%)	
Age(yrs)	39.1±16.2		36.2± 15.4		0.57

Receiver Characteristics and Operative Outcomes

Receivers from LLDN donors and TVNALDN donors were homogeneous in terms of mean age and gender distribution(table 1)

Neither visual analog pain scores scale measured at discharge nor serum creatinine levels at discharge, at the sixth postoperative month, and at the 12th postoperative month differed significantly between the LLDN and TVNALDN groups. No significant difference was detected between groups in terms of duration of hot and cold ischemia, operation time, and length of hospital stay

Operative Characteristics and Receiver Outcomes in Laparoscopic Versus Transvaginal Nephrectomy Groups

	SLDN	(n=140)	TVNALDN	(n=15)	p value
	Mean±SD	**n**	**Mean±SD**	**n**	
Transplantation					
Warm ischemia (s)	176.5±61.3		182.5 ±38.9		0.193
Donor operation time(min)	64.8±16.2		68.7±14.9		0.503
Length of hospitalization (days)	2.3±0.4		2.3±0.5		0.973
VAS pain score at discharge	2±0.5		1.6±0.5		0.766
Serum creatinine (mg/dL)					
At discharge	1.36 ±0.50		1.24 ±0.54		0.852
6 mo post-operatively	1.49 ±0.58		1.40 ±0.67		0.159
12 mo post-operatively	1.35 ±0.41		1.35 ±0.63		0.734

DISCUSSSION:

As the donor nephrectomy is performed in healthy persons kidney donation represents a special situation which necessitates scenarios of maximum effort to minimize the surgical risk and morbidity of the individual.(ref4) Introduction of TVNALDN had led to new option for donor nephrectomy. TVALDN IS THE THIRD GENERATION DONOR NEPHRECTOMY surgery with no large skin incision except port incision reducing post operative pain, preventing abdomen hernia, cosmetic and early recovery. In our study no significant difference between TVNALDN and conventional LDN groups in terms of operative variables, warm ischaemia & operative outcomes. Although the possibility of post operative sexual dysfunction raises concern about the TVANLDN approach,current literature on this topic, mainly gynecology field, suggest that sexual dysfunction is rare even after vaginal surgery.(ref5) In our case series all were related donors (our institution protocol). Most of them were mothers donating kidney to their children, were satisfied and had a feeling of giving birth to them again.

The viability of vagina as an organ of retrieval route was first reported by Alcarez et al.

Absence of pain receptors in the posterior 1/3rd of vagina, elasticity and distensibility of vagina which can be assessed with pervaginal examination makes it safe for organ retrieval. Meticulous care should be taken during endobag retrieval and maintenance of longitudinal lie while retrieval is extremely important for hassle free procedure. Colpotomy should be of adequate size to prevent additional time for retrieval. Use of vaginal retractor during retrieval facilitates satisfactory opening.

CONCLUSION :

1)The TVNALDN seems to be a feasible and reproducible alternative to LLDN in selected cases.

2)The preoperative vaginal swab sterility,endocatch bag,bag opening by nurse and kidney procurement from bag by perfusionist gives a barrier for possible infection

3) The 3D laparoscopy makes surgery comfortable by three dimension vision,magnification,accurate third axis of vision (depth perception) .

4)The 3 D laparoscopy makes makes laparoscopic surgery safe,easier,enjoyable with less learning curve.

REFFERNCES:

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