Moderated Video Session: Miscellaneous Topics
June 29, 2010, 1400-1520

VID01

Use of a Bidirectional Barbed Suture and Early Clamp Removal in Laparoscopic Partial Nephrectomy

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Introduction and Objective: The incidence of renal cell carcinoma currently accounts for 3% of all adult malignancies, and is rising. The current gold standard treatment for most T1 renal masses is open partial nephrectomy (OPN). However, laparoscopic partial nephrectomy (LPN) has gained increased acceptance having shown equivalent results at 5-year oncological and renal function outcomes. Unfortunately, data has shown an increased haemorrhage rate and longer ischemia time. We hypothesise that this is due to technical limitations. The inability to maintain tension on the running continuous suture during primary closure of the defect may result in higher postoperative bleeds. We present a new technique using a barbed tension retaining suture. The barbs allow for the suture to pass through tissue in one direction but not the other, therefore maintaining tension after being let go by the grasping forceps. Furthermore, removal of the renal hilar clamp prior to definitive management of the renal defect with bolstering sutures is theorized to decrease warm ischemia time without significantly compromising intraoperative hemostasis. This early unclamping might also allow the visualisation of smaller bleeding vessels which could then be directly controlled. The objective of these techniques is to decrease blood loss, postoperative haemorrhage rates and ischemia time in the LPN.

Methods: We performed our technique in 16 consecutive LPN for T1 renal masses. In brief, we begin with dissection of the kidney and renal hilum as per the standard laparoscopic operation. A clamp is then applied en-block to the renal vessels. The mass is then removed en block using sharp dissection. Using a single bidirectional 0-PDO barbed suture the renal parenchyma is approximated, beginning with a single bite in the centre of the defect and working towards the ends of the defect until it is closed. Tension in the suture is maintained using 2 self locking clips on each end. The hilar clamp is then removed prior to placement of final bolstering sutures, with or without a biologic hemaostatic agent.

Results: Mean maximal diameter of the 16 masses was 3.2 cm. Mean ischemia time was 12.7 minutes and blood loss was 122 cc. There were no complications and no reoperations.

Conclusions: We have observed that our technique has increased the ease of operation and appears to aid with intraoperative haemostasis. Preliminary results demonstrate a decrease in ischemia time and postoperative bleeding. We have now adopted this method for all our open and laparoscopic partial nephrectomies.

VID02

Demonstration of Extrapleural Catheter Placement for Continuous Paravertebral Block for Flank Surgery: A Case Series

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Introduction and Objective: Neuraxial (epidural) analgesia (NA) has been the gold standard for pain control following thoraco-abdominal and flank surgeries. Continuous thoracic paravertebral block is an alternative to continuous NA for lateral thoracotomy. Continuous paravertebral local anaesthetic block (CPVLAB) has been shown to minimize common side effects associated with NA, while avoiding potential catastrophic complications as a result of neuraxial bleeding or infection. Although CPVLAB has been used for renal surgery it has been performed by Anaesthesiologists via percutaneous access, requiring a great deal of operator skills and experience to ensure correct catheter placement with variable success rates. We present a novel alternative technique of accessing the paravertebral space via an extrapleural approach at the time of flank surgery.

Methods: Fourteen consecutive patients receiving flank incisions for open radical or partial nephrectomy were given CPVLAB via the extrapleural approach. The extrapleural plane is bluntly developed to the heads of the 8th through 12th ribs in the extrapleural space. A catheter is placed with a Tuohy needle passed percutaneously over the 11th rib. Following catheter placement, a bolus of 0.5% bupivacaine is given. For the remainder of the postoperative period, a continuous infusion of ropivacaine is supplemented with breakthrough opioids.

Results: The 14 patients had successful catheter placement and function. They received an average of just 0.6 mg breakthrough IV hydromorphone in the postoperative recovery room. In the 48 hour postoperative period, patients received the equivalent of just 10.6 mg breakthrough oral hydromorphone. There were no complications that arose from the use of this technique.

Conclusions: Surgeon-placed CPVLAB is a novel, safe and very effective method of providing analgesia in the postoperative period for thoracoabdominal and flank surgeries. This represents a significant advance in the postoperative pain management of such patients. We hypothesize that this method is as effective as epidural analgesia, but associated with less opioid-induced side effects and avoids the potential catastrophic complications associated with neuraxial manipulation. At our institution surgeon-placed CPVLAB is the method of choice for lateral thoracotomy and thoracoabdominal surgery for nephrectomy.

VID03

Laparoscopic Partial Nephrectomy for Hilar Renal Masses: Case Series and Surgical Approach

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Introduction and Objective: Nephron sparing surgery (NSS) is the gold standard for the management of T1N0M0 renal cell carcinoma (RCC). Masses in the renal hilum present technical challenges when considering laparoscopic partial nephrectomy (LPN), a technique not yet widely utilized for such tumours. The objective of this study is to demonstrate the surgical approach used at our institution for LPN for hilar masses and its outcomes.

Methods: Thirteen patients underwent LPN for hilar tumours at our centre. Hilar tumours are defined as masses abutting the renal sinus vasculature on preoperative imaging. Our technique includes transperitoneal mobilization of the kidney with exposure of the normal parenchyma while preserving the perirenal fat surrounding the tumour. Intraoperative ultrasound (US) is employed when additional anatomical information is required. The renal hilum is dissected. Perforating vessels from the hilum to the tumour are clipped and divided. The renal hilum is clamped en bloc. The tumour is sharply excised and the central defect is oversewn. Gelatin matrix thrombin and surgical bolsters are placed and secured with bolstering sutures.

Results: The mean age was 61.9 years. The mean diameter of renal lesions on preoperative imaging was 3.4 cm (range 2.0 – 6.5). Three lesions were stage pT1b, while the remainder were pT1a. Intraoperative US was uti-

lized in 3 cases. Mean operative time was 2 hours 3 min, mean ischemia time was 26.6 min (range 12 – 40). Average blood loss was 196 ml (range 30 – 800) and no transfusions were required. The collecting system was entered in 3 cases; all were recognized and repaired intraoperatively. There were no conversions to total nephrectomy or open surgery. There were no instances of postoperative bleeding or urine leaks. Histo-pathology corroborated RCC in all cases. All surgical margins were negative.

Conclusions: Although hilar renal masses portend technical challenges, this series indicates that LPN is a safe and feasible approach for these lesions providing excellent oncological outcomes without significant risk of complications.

VID04

Concurrent Placement of the Advance Male Sling and Three-Piece Inflatable Penile Prosthesis

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Introduction and Objective: Radical prostatectomy remains a common treatment for localized prostate cancer. Unfortunately, postprostatectomy incontinence (PPI) and erectile dysfunction (ED) can result. Placement of a 3-piece inflatable penile prosthesis (IPP) is an excellent treatment option for ED. While placement of an artificial urinary sphincter is considered the gold standard for the treatment of PPI, the AdVance male sling (American Medical Systems) has been shown to be an effective treatment for mild-to-moderate PPI. For men who suffer from both PPI and ED, a single procedure that addresses both complaints is ideal. In this video, we demonstrate our surgical technique for the concurrent placement of an AdVance sling and an IPP.

Methods: All patients demonstrated treatment refractory erectile dysfunction and mild to moderate incontinence. Preoperative evaluation included cystoscopy to confirm the presence of residual sphincter function. Concurrent sling and IPP placement was carried out in lithotomy position with a midline perineal incision for the sling and a transverse scrotal incision for the IPP. The sling was placed first, and then the IPP. Patients had a foley catheter placed at the time of surgery, which was removed the morning following surgery.

Results: Technical considerations are presented in the video presentation. Average operative time was 85 minutes. Of 22 patients, 2 (9%) report persistent incontinence ranging from 1–2 pads/day. At the time of this accompanying abstract, 20/22 patients were using the IPP successfully at 6 months post-surgery or longer. There were no postoperative prosthesis-related infections.

Conclusions: The concurrent placement of the AdVance male sling and an IPP is a safe, efficacious treatment option for men who have post-prostatectomy incontinence and erectile dysfunction.

VID05

Laparoendoscopic Single Site Partial Nephrectomy in a Hypertensive Porcine Model Using the Sliding Clip Technique

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Introduction and Objectives: Laparoendoscopic single site (LESS) partial nephrectomy (PNx) is in the developing phase. Rapid and safe haemostatic renorrhaphy during LESS PNx is technically challenging due to the inherent limitations of LESS surgery such as loss of triangulation and instrument clashing. The sliding clip technique has been described in the robotic literature. Our objective is to test the feasibility and safety of the sliding clip technique in LESS PNx. Our hypothesis is the sliding clip technique is an efficient, rapid, and safe method of renorrhaphy in LESS PNx.

Methods: We performed bilateral LESS PNx in 4 pigs after having obtained approval from institutional Animal Care and Use Committee. We started the procedure by placing an arterial line using a carotid cut-down for instantaneous blood pressure monitoring. The Triport® (Olympus,USA) & SILS port® (Covidien, USA) were used equally for access along with the 5 mm flexible tip Endoeye® (Olympus,USA) for vision. Roticulating scissors and dissector were used in addition to straight instruments. We inserted a 3 mm clamp in the upper midline to allow for clamping of the renal artery on each side. Renorrhaphy was performed using 2-0 polytrimethyline carbonate on a GS-21 needle. We applied bolsters in the first 4 procedures but omitted their use in the last 4 procedures. After finishing the renorrhaphy, the artery is unclamped. If there is no bleeding for 5 minutes post unclamping, intravenous dopamine is infused and titrated to raise the systemic pressure to more than 180 mmHg.

Results: Eight LESS PNx were performed. None of the renorrhaphy leaked after unclamping or after raising the pressure more than 180 mmHg. Warm ischemia time was more than 1 hour in the first 4 procedures while it improved to less than 30 minutes in the last 4 procedures as we gained experience.

Conclusions: The sliding clip technique is feasible and safe in LESS PNx. Clinical application of this technique needs to be tested after having obtained satisfactory outcome in the animal model. The learning curve for LESS improves rapidly during the first 8 cases.

VID06

Management of Venous Thrombosis Causing Renal Allograft Dysfunction

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Introduction: We present a case of iliac vein deep vein thrombosis (DVT) leading to renal allograft dysfunction in the early postoperative period.

Methods: A 72-year-old man with ESRD secondary to C-ANCA vasculitis underwent an uncomplicated standard criteria deceased donor renal transplant in the left iliac fossa. This patient received standard immunosuppression consisting of prednisone, tacrolimus and mycophenolate mofetil. The allograft demonstrated excellent function and the patient was discharged from hospital on the seventh postoperative day with a serum creatinine level of 90 mmol/L. Two weeks postoperatively, he presented with anuria and found to have an elevated serum creatinine value of 542 mmol/L.

Results: Doppler ultrasound imaging demonstrated an enlarged renal allograft (13 cm) with elevated resistive indices of 0.9. Both ultrasonography and computed tomography (CT) of the abdomen demonstrated a massive deep venous thrombosis extending from the left popliteal region up to the confluence of the left common iliac vein and the inferior vena cava. As well, a left sided 5x5x8 cm pelvic lymphocele compressing the iliac vein was noted. This clot abutted, but did not enter the allograft renal vein. A fenestrated infusion catheter was placed in the left popliteal vein alongside the DVT by the interventional radiology team, allowing the administration of tissue plasminogen activator (tPA) at a slow rate to break up the clot over 48 hr. Venography and CT both demonstrated the resolution of the DVT. Subsequent treatment of the lymphocele by creation of a peritoneal window was performed. Renal function improved immediately and returned to baseline level of 95 mmol/L 1 year later.

Conclusions: In the setting of acute renal allograft dysfunction along with ipsilateral leg swelling, presence of iliac vein DVT must be considered. We present a novel method of therapy utilizing local administration of tPA to enable clot lysis.

VID07

Backstop(TM) To Prevent Retropulsion During the Treatment of Ureteral Calculi

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Introduction and Objective: Stone retropulsion can be problematic during ureteroscopy, increasing surgical complexity and adversely affecting stone-free rates. Backstop™, a novel reverse thermosensitive polymer, has recently been approved for the prevention of stone retropulsion during intracorporeal lithotripsy. This compound exhibits an increase

in viscosity over a narrow temperature range, converting from a liquid to a gel at 16-18°C. We demonstrate the use of this technology in three distinct clinical scenarios.

Methods: Backstop was used in 2 clinical cases including a patient with an obstructing distal ureteric stone and a dilated proximal ureter, as well as a patient with an impacted upper ureteral stone preventing passage of a guidewire. Finally, in a third case, we demonstrate the addition of methylene blue to the gel matrix, enhancing visibility of the polymer during stone manipulation.

Results: Semi-rigid ureteroscopy for the treatment of urolithiasis was successfully performed in both the upper and lower ureter using Backstop to prevent stone retropulsion. Despite prolonged pressurized irrigation, the polymer was persistent and effective. Backstop did not affect stone fragmentation with the Ho:YAG laser. Clearance of stones by ureteral peristalsis was enhanced due to formation of a coagulum. No complications from Backstop have been observed to date.

Conclusions: Backstop has clinical utility in the prevention of stone retropulsion during intracorporeal lithotripsy. In addition, the gel may act as a coagulum, enhancing peristaltic clearance of stone from the ureter. Further studies are warranted to validate these observations.