ABDOMINOVAGINAL TECHNIQUE FOR COMPLETE REMOVAL OF TRANSOBTURATOR SLINGS
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Introduction and Objectives: Transobturator vaginal mesh is commonly used for the treatment of female stress urinary incontinence. Complications of transobturator mesh may include hip, groin, or leg pain that can occasionally be debilitating. Total removal of mesh may resolve or improve pain symptoms but can be a challenging or daunting procedure. In this video we present the technique of the complete removal of transobturator vaginal mesh.

Methods: Through a transvaginal approach, bilateral oblique distal vaginal incisions are made and the vaginal epithelium is dissected away from the periurethral fascia. The mesh is isolated and anterior and posterior vaginal wall flaps are created. The mesh is transected in the midline and dissected free transvaginally. The cut end of the mesh is secured with a stay suture for later identification. Labial incisions made over the obturator foramen bilaterally. Dissection is carried through the adductor longus muscle, gracilis muscle, adductor brevis muscle, and obturator internus muscle to the vaginal wall. The mesh is freed from the inferior pubic ramus bilaterally. The mesh is carefully passed under finger control from the vagina to the labial incisions and dissected free. The labial and vaginal incisions are closed and an indwelling catheter is left in place postoperatively.

Results: From June 2009 to August 2013 we have performed 217 surgeries for the removal of vaginal suburethral slings. Of these, 92 have included the removal of transobturator mesh. 16 patients had more than one mesh removed at the time of surgery. Average surgery time for removal of one transobturator sling was 84 minutes. 44% of patients had complete removal of their mesh, although degree of mesh removal was not recorded for 40 patients (64%). Complete removal of transobturator mesh may improve or completely resolve symptoms of pain. 2 Dissection of the mesh in the inferior and medial portion of the obturator foramen on the inferior pubic ramus is key to avoid injury to the obturator nerve and artery. None of our patients complained of obturator nerve injury postoperatively.

Conclusions: Complete transobturator mesh sling removal is feasible using this abdominovaginal approach. There is minimal perioperative associated morbidity associated. Long term outcome data is still forthcoming.
ANATOMY OF TRANSOBTURATOR SLING SURGERY
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Objective: Mid-urethral sling placement using mesh remains the most common type of surgery performed for the treatment of female stress urinary incontinence. Approximately 250,000 mesh slings were placed in 2010, with about a quarter of these procedures involving transobturator tape (TOT) slings. Erosion of mesh through the vagina is the most commonly reported mesh-specific complication associated with mid-urethral slings, and may result in local and systemic effects that necessitate complete removal of the sling. However, while the insertion of a TOT sling is a relatively simple procedure, removal of all the mesh requires a complex and delicate dissection around the obturator foramen. We will review the pelvic anatomy important in placement and removal of a TOT sling.

Methods: Using three-dimensional surgical videos, cadaveric images, and anatomy illustrations, we identify the major structures of the obturator region necessary to perform a complete dissection.

Results: The pelvic muscles and superficial nerve distribution are highlighted to shed light on the anatomical basis of de novo symptoms that may arise following TOT sling placement. A firm grasp of these structures is necessary for proper and complete removal of a TOT sling.

Conclusions: Deep knowledge of the anatomy of the obturator region is essential during the placement and removal of TOT slings. Pelvic surgeons must be familiar with the structures in the obturator region so that they can appropriately manage complications related to transobturator mesh.
ROBOTIC PYELOLITHOTOMY WITH TRANSABDOMINAL PYELOSCOPY AND STONE EXTRACTION FOR THE TREATMENT OF STAGHORN CALCULI
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(Presentation to be made by Dr. Stepanian)

Purpose: Percutaneous nephrostolithotomy (PNL) is the preferred approach for the treatment of renal calculi larger than 2 cm. Often times, stones larger than 3 cm, require a multimodal or multi-step approach depending on stone burden, composition, and patient anatomy. Robotic pyelolithotomy has been described for the treatment of large renal stones confined to the renal pelvis, but limited data exists regarding the treatment of staghorn calculi via a robotic approach. We describe, the use of robotic pyelolithotomy combined with transabdominal pyeloscopy for the treatment of large, branched renal stones.

Materials and Methods: We present two patients who underwent robotic pyelolithotomy combined with transabdominal pyeloscopy for the treatment of staghorn calculi as performed by a single surgeon (JRP). Both patients had an overall stone burden of 4 cm based on CT scan, and had multiple calyces involved. The procedures were performed utilizing a transperitoneal 4-arm robotic approach with the patient in the 60-degree flank position. The renal pelvis was exposed and a longitudinal pyelotomy was made. Stones in the renal pelvis were extracted robotically and placed into a laparoscopic specimen bag. All calyces were then inspected by means of a flexible ureteroscope inserted through the 12 mm assistant port and guided in to the collecting system. Additional stones beyond the view of the robotic scope were extracted using a 2.2F tipless basket. No patients were stented at the time of the initial procedure. The pyelotomy was then closed with a running 3-0 polyglactin and a closed suction drain was brought into the peritoneum.

Results: Two patients underwent robotic pyelolithotomy combined with transabdominal pyeloscopy for staghorn calculi. Four and 3.6 grams of stone material was removed for each patient, respectively. One patient was discharged on postoperative day number 3 after removal of the drain and has been recovering well since surgery. The other patient was discharged on day number one following drain removal and subsequently required readmission for pyelonephritis on postoperative day 5, which resolved with antibiotics and ureteral stenting. The stent was removed in one week, and the patient has been recovering well since. Incidentally, a CT scan done on the day of readmission confirmed no residual stone fragments.

Conclusions: Robotic pyelolithotomy combined with transabdominal pyeloscopy and basket stone extraction was a safe and effective treatment of large, branched renal stones. The addition of flexible pyeloscopy through a trocar allows for the direct inspection of intrarenal calyces. This approach eliminates the need for a percutaneous tract through the renal parenchyma and decreases the risk of renal bleeding associated with PNL.

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ROBOTIC-ASSISTED TRANSURETEROURETEROSTOMY USING A LOWER ABDOMINAL APPROACH
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Introduction: Transureteroureterostomy (TUU) is a well-established procedure to correct proximal ureteral stricture disease. Common approaches more often require an open operation. While laparoscopic procedures have been described, we present a novel robotic-assisted lower abdominal approach to correct a proximal ureteral injury.

Materials and Methods: The patient is a 38 year-old male suffering from diverticular disease who underwent multiple abdominal procedures resulting in a severely injured left ureter causing ureteral obstruction not amenable to endourologic options. The key elements to our approach were: (1) Supine position. (2) Over the left shoulder robotic docking. (3) Infra-umbilical trocar placement. (4) Hammock sutures suspending the posterior peritoneum. (5) Passage of the donor ureter under the mesentery proximal to the inferior mesenteric artery with anastomosis in a tension-free manner to the recipient ureter.

Results: The case was uncomplicated with an operative time of 243 minutes. The estimated blood loss was <10ml. The patient recovered as expected. He was discharged from the hospital on post-operative day #3. Follow up retrograde ureterogram at 3 months revealed a patent anastomosis.

Conclusion: The described technique provided a minimally-invasive approach for transureteroureterostomy with excellent visualization and access in a patient that had a history of multiple abdominal surgeries. Morbidity was low and the outcome was excellent. The views and opinions expressed herein are those of the authors and do not necessarily reflect the official policy or position of the Department of the Navy, Department of Defense, or the U.S. Government.
A NOVEL USE OF NEAR INFRARED FLUORESCENCE TO IDENTIFY THE LOCATION AND EXTENT OF URETERAL STRICTURES DURING ROBOTIC RECONSTRUCTIVE SURGERY
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(Presentation to be made by Dr. Stepanian)

**Purpose:** Identifying the extent of ureteral scarring and fibrosis is critical to the success of excision and primary anastomosis of ureteral strictures. While retrograde pyelogram will show the location of the narrowing associated with a ureteral stricture, this is difficult to correlate with the exact location on the external surface of the ureter. Identifying the exact location of the stricture is important to allow removal of the stricture alone and maintain as much normal ureteral tissue as possible. We present a novel intra-operative technique to identify the exact location of ureteral strictures from the external surface of the ureter using Near Infrared Fluorescence (NIRF) during robotic ureteral reconstruction.

**Materials and Methods:** Patients with ureteral strictures who had failed endoscopic management of the stricture were treated with percutaneous nephrostomy tube placement to drain the kidney and allow the stricture to mature. At the time of ureteral reconstruction, retrograde pyelogram was performed and a 5F ureteral catheter was left in the ureter below the level of the stricture. A standard transperitoneal technique to primary ureteral reconstruction was performed using a 4-arm robotic approach. Once the ureter was dissected and identified, the location of the stricture was determined by simultaneous injection of indocyanine green (ICG) mixed with albumin through both the ureteral catheter and the percutaneous nephrostomy tube. Using NIRF visualization, the internal location of the stricture was identified and correlated with the external surface of the ureter, giving a precise location and extent of the stricture. Primary ureteral re-anastomosis was then performed after careful excision of the strictured segment.

**Results:** Three patients underwent ureteral stricture reconstruction using NIRF to identify the precise location of the ureteral stricture and guide excision. Primary ureteral re-anastomosis with replacement of a ureteral stent was performed in all patients. After stent removal, postoperative diuretic renography showed clinically significant improvement in T½ drainage times in all patients: 39 to 17 mins, >50 to 5 mins and >50 to 15 mins. All patients had resolution of symptoms postoperatively, and there were no complications from intra-ureteral injection of ICG.

**Conclusions:** The location and the extent of ureteral strictures can be clearly identified using NIRF during robotic reconstructive surgery. This technique facilitates excision of the narrowed segment of the ureter and allows intraoperative correlation with the external surface of the ureter thereby reducing the amount of normal ureter excised during ureteral reconstruction.

**Source of Funding:** None
Introduction and Objectives: Following brachytherapy alone for the treatment of Prostate Cancer, the incidence of bladder neck contractures, prostatic urethral stenosis, and bulbo-membranous urethral strictures ranges between 0-12%, usually 4-5%. This has traditionally been a very challenging complication for both the patient and the Urologist. These patients often have a degree of bladder dysfunction and a decreased bladder capacity. Options available to the Urologist have been suprapubic diversion, endoscopic treatment, or less commonly described, radical retropubic prostatectomy (RRP). Having a patient with prostatic urethral stenosis and a membranous urethral stricture who failed endoscopic management and was dissatisfied with suprapubic diversion, we performed a Robotic Prostatectomy with excision of the membranous urethral stricture and primary anastomosis.

Methods: The case was surgically approached in a similar fashion to a robotic assisted laparoscopic prostatectomy. At the level of the prostatic apex the dorsal venous complex and urethra were fibrotic. With the assistance of flexible cystoscopy, the extent of the stricture was established. The membranous urethral stricture was excised robotically. The anastomosis was completed using running monocryl suture in the standard fashion without difficulty.

Results: The operative time was 135 minutes with a blood loss of 50 cc. The patient was discharged home on POD1 and returned to clinic 14 days later for a cystogram which did not demonstrate a urine leak. The catheter was removed. He is incontinent and has been scheduled for an artificial urinary sphincter to complete the reconstruction.

Conclusions: While radiation induced and membranous urethral strictures are exceedingly difficult management dilemmas, several strategies have been proposed. Mundy and Andrich describe a series of 9 patients undergoing RRP for prostatic urethral stenosis with a success rate of 66%, although they describe several difficulties to include dissection and definition of the prostate and the anastomosis. The robotic approach demonstrated in our video displays an improvement in visualization, ease of dissection and anastomosis. The assistance of the cystoscope in the surgical management intraoperatively greatly facilitated our ability to expeditiously identify the extent of the stricture. This option for the management of radiation induced prostatic and membranous urethral strictures should be included as a potential choice for these patients.

Source of Funding: None
Purpose: We present our experience with a technique that can be used in pediatric patients presenting with concomitant ureteropelvic junction obstruction and nephrolithiasis.

Materials and Methods: The patient is a three-year old boy presenting with left flank pain that was found to have radiographic evidence of hydronephrosis and stones in the left kidney. Pre-operative work up included cystoscopy and left retrograde pyelogram that revealed moderate hydronephrosis with a medially inserting ureter. However, MAG-3 renal scan with Lasix washout revealed moderate left hydronephrosis with a T1/2 of 12 minutes. Given persistent hydronephrosis associated with nephrolithiasis, we proceeded with a robotically-assisted pyeloplasty and nephrolithotomy. The ureteropelvic junction was exposed and ureter disarticulated from the pelvis in the usual fashion. Prior to repairing the ureteropelvic junction, a flexible ureteroscope was introduced through a 5 mm accessory port into the pyelotomy where the stones were identified and removed under direct vision using a basket. Routine dismembered pyeloplasty was then performed with antegrade placement of a ureteral stent.

Results: The operative time was 194 minutes, estimated blood loss was minimal, and hospital stay was 1 day. There were no intraoperative or post-surgical complications. Two out of three stones were successfully extracted. The third stone could not be extracted, but passed without incident. At one-year follow-up, the patient was pain free and had no radiographic evidence of residual stone burden. MAG-3 renal scan showed no functional obstruction and renal ultrasound showed improved, mild hydronephrosis.

Conclusions: Treatment of concomitant ureteropelvic junction obstruction and nephrolithiasis can be done in a safe and minimally invasive manner with excellent short and long-term results in the pediatric population. We found a limitation of simultaneous robot assisted laparoscopic pyeloplasty and endoscopic stone extraction to be the inability to utilize fluoroscopy and contrast to identify and localize stones. However, with a successful pyeloplasty, the remaining stone was able to spontaneously pass without incident.
PRE-TRANSPLANT ROBOTIC ASSISTED LAPAROSCOPIC SIMPLE NEPHRECTOMY WITH CREATION OF CATHETERIZABLE URETERAL STOMA

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(Presentation to be made by Dr. Kokorowski)

Purpose: Pre-transplant creation of a catheterizable urinary stoma is commonly recommended for boys with poor bladder emptying secondary to posterior urethral valves. Typically the appendix is fashioned into a continent vesicostomy (Mitrofanoff procedure) or a segment of intestine is harvested (Yang-Monti procedure). We describe a minimally invasive use of the native ureter as a catheterizable channel in a boy with chronic renal disease and neurogenic bladder secondary to posterior urethral valves.

Materials and Methods: The patient is a 7-year-old boy with a history of stage IV chronic kidney disease secondary to posterior urethral valves. He was on intermittent catheterization for a neurogenic bladder with good capacity and compliance, but poor emptying. He also had a history of bilateral high-grade vesicoureteral reflux, which resolve on the left side and persisted into a small dysplastic appearing right kidney. His pre-operative serum creatinine was 2.3 and his GFR estimated to be 15-29 ml/min with little function from the small right kidney. Pre-transplant right nephrectomy with creation of a catheterizable vesicostomy was recommended and discussed with the family.

Results: The procedure began with placement of a 12mm umbilical camera port, two 8mm robotic arm ports (one in the right lower quadrant and another in the midline four fingers from the umbilical port), as well as a 5mm assistant port. We began with a simple right nephrectomy and transected the dilated ureter proximally. Once separated from the surrounding tissue, the kidney was placed in a specimen bag and left in situ until the end of the procedure. An additional 8mm robotic arm port was placed in the left lower quadrant and the robot repositioned for the ureteral reimplantation with vesicostomy creation. A long submucosal tunnel was made along the right side of the urinary bladder from the ureteral insertion towards the dome by dividing the detrusor muscle. The ureter was placed in the tunnel and the detrusor muscle re-approximated to create an anti-reflux valve. The proximal ureter was then brought out through the right lower quadrant 8mm port site and matured to the skin. Continence of the vesicostomy was tested and a drain positioned in the pelvis via the left lower quadrant 8mm port site. Post-operative course was uneventful and the patient is completely dry on intermittent drainage with 12 fr catheters.

Conclusions: Robotic assisted laparoscopic simple nephrectomy with creation of a continent native ureter stoma is a feasible minimally invasive method for creating a catheterizable vesicostomy in carefully selected patients.
A VENTRAL APPROACH TO BURIED PENIS REPAIR IN CHILDREN
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The correction of buried penis is a common urologic procedure at Seattle Children’s Hospital. We present here a video that details a penoscrotoplasty using a ventral approach that has produced good results in over 1,000 patients. The three main advantages of this approach are an operative time under 30 minutes, ease of degloving the penis, and because all tissue is preserved until the final trimming, all options are available intraoperatively. Occasionally there will be some separation of the ventral closure which pulls together by secondary intent. In chubby babies the penis may look somewhat retrusive at first until the suprapubic fat pad recedes with age and activity. No child has required a return to the operating room and there have been no infections or significant bleeding episodes.