

BASIC RESEARCH SYMPOSIUM 1/2 THURSDAY, SEPTEMBER 19

P1-17

SIMPLIFIED LAPAROSCOPIC RADICAL CYSTECTOMY WITH ORTHOTOPIC ILEAL NEOBLADDER IN THE PORCINE MODEL

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Introduction:

Laparoscopic radical cystectomy with orthotopic ileal neobladder is a technically challenging surgical procedure. We present our experience with a simplified technique for laparoscopic cystectomy and neobladder in the porcine model.

Materials and Methods:

Eight female minipigs underwent a purely laparoscopic radical cystectomy with orthotopic ileal neobladder. Nine ureterointestinal anastomoses (UIA) were performed using a simplified "dunk" technique. The ureter was prolapsed 5 mm into the afferent limb and the periureteral tissue was secured to the bowel serosa with 3 superficial sutures (6 ureters without stents, three with indwelling stents). In seven ureters the anastomosis was performed using a running mucosa to mucosa technique (3 with stents, 4 without stents). The Lapra-Ty (Ethicon Endosurgical, Cincinnati, OH USA) suture clip was used to secure the running sutures on the urethra, ureters and neobladder. Animals were harvested at 3–8 weeks (mean 6 weeks) following surgery. Serology, static cystogram, IVP, gross and histopathologic evaluations were performed.

Results:

Of 6 unstented "dunked" UIA 2 (33%) were widely patent, 2 (33%) were strictured but patent, and 2 (33%) were completely obstructed. In the 3 stented ureters performed using the "dunk" technique 1 (33%) was widely patent, 1 (33%) was strictured, and 1 (33%) was completely obstructed. All UIA performed with a mucosa to mucosa running anastomosis whether stented (3 ureters) or not stented (4 ureters), were widely patent (100%). Lapra-Ty clip migration into the neobladder pouch caused urethral obstruction resulting in delayed bladder perforation in two animals.

Discussion:

Laparoscopic cystectomy and ileal neobladder is a technically feasible surgical technique. Attempts to simplify the ureterointestinal anastomosis require further evaluation and modification. Stent placement appears to be unnecessary in the laparoscopic ureterointestinal anastomosis.

P2-1

VALIDATION OF THE UNIVERSITY OF WASHINGTON VIRTUAL REALITY TURP SIMULATOR AS A TRAINING TOOL

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Introduction: We have completed version 1 of a prototype training simulator for TURP. Value of such a training tool is evident only through validation protocols. We present our work in progress for validating the UW TURP simulator as a training tool.

Methods: Urologists and novices of varying levels of experience completed a five minute resection task as efficiently as possible, attempting to maintain the least amount of blood loss, while conserving irrigant. Metrics were logged for each subject. Resection styles were correlated with efficiency and all metrics were stratified with respect to experience level, video game experience and demographic data. Feedback with regards to acceptability was obtained after the simulation task.

Results: 98% of urologist participants believe that TURP is the standard of care of medically refractory symptoms of bladder outlet obstruction. 99% believe that a validated simulator would be useful in training programs. 76% felt that a validated simulator would be useful to maintain skills after residency. After the simulation task, 93% of participants believed that the UW TURP simulator would be useful as a training tool. 88% felt that it should be implemented into the curriculum of residency programs and 58% felt that it should be used for accreditation. The various components of the simulator were individually rated and all means were above the acceptability threshold. Urologists performed better than novices.

Discussion: Version 1 of our TURP simulator performed well in its first validation trial. TURP is still perceived to be the gold standard for symptoms of bladder outlet obstruction and is thus an extremely important skill to train. The perception of its potential as a training tool was positive, though many useful recommendations were made on how to make it more realistic. Through logging metrics during the simulation task, we have established content and construct validity for this simulator to train TURP.

P1-18

LAPAROSCOPIC RADICAL CYSTECTOMY WITH ORTHOTOPIC NEOBLADDER URINARY DIVERSION-AN ANIMAL STUDY

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Purpose: The operative time for any reconstructive laparoscopic procedure is extremely lengthy due to poor anastomosing technology at present. In order to assess the feasibility of orthotopic ileal neobladder after laparoscopic radical cystectomy, this animal study tested tissue fibrin glue for the approximation of the urethra and the ileal neobladder.

Materials and Methods: Eighteen pigs (1 male, 17 female) underwent laparoscopic radical cystectomy with orthotopic urinary diversion (Camey's pouch). Both ends of a 20cm U-shaped segment of ileum were sutured with bilateral ureters, and the central portion was anastomosed with the urethra. The first 12 pigs underwent laparoscopic entero-enteral anastomosis and entero-ureteral anastomosis. In the remaining 6 pigs, a 3–4cm low abdominal midline incision was made, the ileum and ureter were anastomosed extracorporeally. In all pigs, one laparoscopic stitch was placed for fixing the neobladder and urethra. Two ml. of fibrin glue (Tisseel TM, Baxter, Austria) was applied around the anastomosis which was fixed by traction with an indwelling Foley catheter. IVU and cystogram were performed one week postoperatively. Pigs were sacrificed in 4 weeks.

Results: In the first 12 pigs, the mean operative time was 8.5 hours (range 7–13 hours). Only one pig survived 4 weeks. Of the remaining 6 pigs, 4 pigs survived to 4 weeks, and the mean operative time was shortened to 4.2 hours. IVU revealed bilateral hydronephrosis of variable degrees and cystogram revealed no obvious urine leakage at the neobladder-urethral anastomotic site. The entero-urethral anastomotic site showed collagen fiber ingrowth in the intestinal and urethral muscle layers histologically. Growth of the intestinal and urethral mucosa was not seen.

Conclusions: In our study, fibrin glue did not provide good healing condition for mucosa growth, but it successfully prevented urine leakage and resulted in connective tissue growth in muscle layer.

P2-2

INTRAPROSTATIC LESIONS INDUCED BY THE NEW TUNA GENERATOR AND CATHETER SYSTEM: AN HISTOPATHOLOGICAL STUDY

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Introduction: TUNA treatment for BPH has been demonstrated to produce well-defined coagulative lesions in 5 minutes. Because all new technologies including further developments of older devices require a careful analysis, we studied a new generation of TUNA catheter and generator. These now allow to monitor the temperature at the center of the lesion and to achieve maximum temperature levels in less than 30 seconds.

Methods: We have compared the size of lesions induced by 2, 3 and 4 minutes of TUNA treatment using a new TUNA system. Ten patients were treated with TUNA immediately prior to open retropubic prostatectomy. We used NADPH staining to assess the extent of the lesions induced by TUNA on the surgical specimens. All treatment were performed in the right lobe whereas the left lobe was used as control.

Results: We performed 28 lesions (8 of 2 minutes, 10 of 3 and 10 of 4 minutes). Needle deployment varied from 16 to 22 mm. On pathological examination, untreated contralateral lobes did not show any lesion. Lesions created (absence of NADPH staining) by 2 minutes of treatment (up to 14 mm x 8 mm) were statistically smaller than the needle deployment and than those induced by 3 and 4 minutes of treatment ($p < 0.01$, t-test). The maximal extent of lesion was already achieved in 3 minutes (up to 25 x 15 mm) with a complete destruction of the treated tissue on NADPH.

Conclusions: Extensive reproducible lesions are created in already 3 minutes of treatment with the new TUNA catheter and generator. More rapid creation of lesions may allow for quicker treatment and/or more extensive treatment of BPH patients.