

87.8, 100.4°C. Fig 2A shows MP touch cautery remained above 45 °C, 8-15 seconds after application. Thermal spread was comparable between each intensity of MP cautery (5.6mm) (p=0.86). The immediate application of ice cold saline reduced the tissue temperatures to <40 °C within 4 seconds of cautery application, Figure 2B.

CONCLUSIONS: Even minimal amounts of electrocautery raises initial tissue temperatures to 85-100 °C. Fear of any Thermal injury led to Athermal nerve sparing techniques during RARP. However the heat dampening capacity of ice cold saline irrigation reduced tissue temperatures to near physiologic levels within 4 seconds. These thermodynamic experiments suggest that the use of ice cold saline irrigation could allow the use of 'touch cautery' in the dissection and hemostasis of neural and other sensitive tissues in clinical studies.

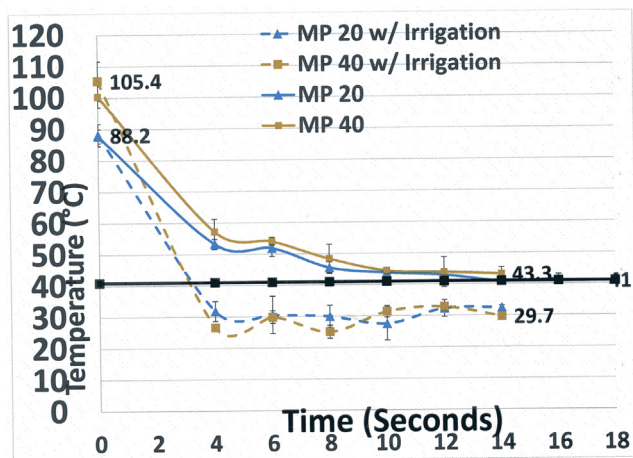


Figure 2A. MP 20 short burst cautery at T₀ (104 °C) versus 4 sec (63.6 °C), 8 sec (51.0 °C) and 12 sec (44.3 °C) on Bladder

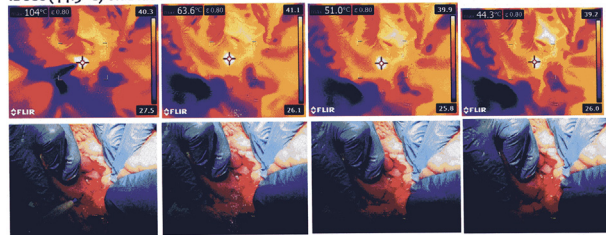
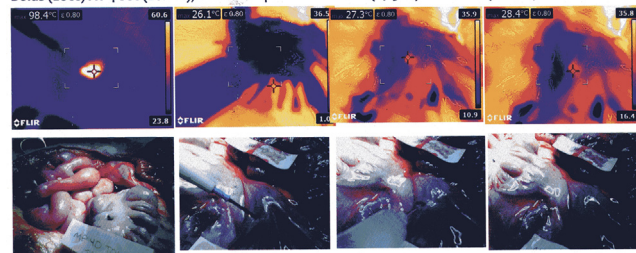


Figure 2B. MP 40 Watt short burst cautery on bowel at T₀ (98.4 °C) versus ICE COLD IRRIGATION Bolus (20cc) AT 4 sec (26.1 °C), and subsequent times 8 sec (27.3 °C) and 12 sec (28.4 °C)



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MP23-06
TRANSVAGINAL NATURAL ORIFICE TRANSLUMINAL
ENDOSCOPIC SURGERY (NOTES) IN UROLOGY: REPORT OF 261
CASES IN A SINGLE CENTER

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INTRODUCTION AND OBJECTIVES: The feasibility of transvaginal natural orifice transluminal endoscopic surgery (NOTES) has

already been demonstrated in urology. However, the experience is limited. We aimed to describe our experience with the transvaginal NOTES in female patients, and to evaluate its clinical value.

METHODS: Between May 2010 and July 2015, a total of 261 female patients were underwent transvaginal NOTES in our center. The median age was 39.2(range 23 to 76) years and the median body mass index was 21.6(range 15.4 to 32.6) kg/m². After induction of general anesthesia, the patients were positioned in lithotomy with ipsilateral lumbar at 30-60° angle to the floor. In transvaginal NOTES-assisted laparoscopic procedures, a 5-mm trocar and a 10-mm trocar were inserted in the umbilical edge for conventional operating apparatus. A 5-mm or 10-mm trocar was inserted in the posterior vaginal fornix for a 5.4-mm flexible-tip 0° or 10-mm 30° laparoscope. In pure transvaginal NOTES procedures, a 30-mm incision was made at the posterior vaginal fornix, and a 5mm trocar was introduced into the pelvic cavity guided by a 5-mm forceps. A 5.4-mm flexible-tip 0° laparoscope was inserted into the pelvic cavity confirming no rectal injury. Then a Zou-Port or TriPort was introduced at the posterior vaginal fornix. In transvaginal NOTES-assisted hybrid endoscopy for nephroureterectomy, the ipsilateral lower ureteral was dissected and clipped with Hem-O-lock clips near the bladder. Then, the pneumovesicum method was applied with CO₂ insufflation, a resectoscope was inserted into the bladder, and dissection was performed circumferentially through the entire detrusor muscle to disconnect the ureter from the bladder wall. Lastly, transvaginal NOTES-assisted laparoscopic nephroureterectomy was performed. Dissection was performed according to the method of the standard laparoscopy. The intact specimen was extracted transvaginally.

RESULTS: Transvaginal NOTES was successfully completed in 254 patients. One patients required conversion to suprapubic-assisted laparoendoscopic single-site surgery because of the rectal injury in pure transvaginal NOTES nephrectomy. Six patients underwent open conversion. The various transvaginal NOTES-assisted laparoscopic procedures included adrenalectomy (N=28), nephrectomy (N=178; simple 147, radical 31), partial nephrectomy (N=14), heminephroureterectomy for duplex kidney (N=4) and hybrid endoscopy for nephroureterectomy (N=8). The various pure transvaginal NOTES procedures included nephrectomy (N=18, simple 17, radical 1), renal cyst excision (N=5). Five cases of transumbilical multiport laparoscopic nephrectomy and one laparoscopic radical cystectomy with transvaginal specimen extraction were performed. The mean operative time was 65(45-310) min, 95(70-280) min, 115(100-190) min, 98(87-110) min, 180(160-245) min, 190(160-320) min and 80(60-90) min and estimated blood loss was 110(20-800) ml, 70(30-800) ml, 130(50-450) ml, 225(160-300) ml, 183(100-500) ml, 170(100-500) ml and 25(20-50) ml for transvaginal NOTES-assisted adrenalectomy, transvaginal NOTES-assisted nephrectomy, transvaginal NOTES-assisted partial nephrectomy, transvaginal NOTES-assisted heminephroureterectomy, transvaginal NOTES-assisted hybrid endoscopy for nephroureterectomy, pure transvaginal NOTES nephrectomy and pure NOTES transvaginal renal cyst excision, respectively. Complications occurred in 55 cases (21.1%), including 20 cases (7.66%) of severe complications, and no death case. The mean follow-up of 48(range 3 to 67) months showed hidden umbilicus scar. The incision in the vagina healed well. No infection in the abdominal or pelvic cavity or celiocele occurred.

CONCLUSIONS: Transvaginal NOTES is feasible, safe and effective. It provides a good cosmetic outcome. However, existing instruments need improving for the development of transvaginal NOTES.

Source of Funding: none

MP23-07
BIODEGRADABLE DRUG-ELUTING STENTS: TARGETING
UROTHELIAL TUMORS OF UPPER URINARY TRACT

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INTRODUCTION AND OBJECTIVES: Urothelial tumors of upper urinary tract are ranked among the most common types of

cancers worldwide. The current standard therapy to prevent recurrence is intravesical Bacillus-Calmette–Guerin (BCG) immunotherapy, but it presents several disadvantages such as BCG failure and intolerance. Another way is to use chemotherapy, which is generally better tolerated than BCG. In this case, drugs such as epirubicin, doxorubicin, paclitaxel and gemcitabine are used. Nevertheless, intravesical chemotherapy only prevents recurrence in the short-term. These failings can be partially attributed to the short residence time and low bioavailability of the drug within the upper urinary tract and the cancer cells, resulting in a need for frequent drug instillation. To avoid these problems, biodegradable ureteral stents impregnated by supercritical fluid CO₂(SCF) with each of the four anti-cancer drugs were produced.

METHODS: Four types of drug-eluting biodegradable stents were studied, impregnated with paclitaxel, epirubicin, doxorubicin and gemcitabine. The release kinetics of the impregnated drugs from the anti-cancer drug-eluting stents was measured in artificial urine solution (AUS) for 9 days by UV spectroscopy in a microplate reader. The anti-tumoral effect of the developed stents in transitional cell carcinoma (TCC) and HUVEC primary cells, used as control, was evaluated.

RESULTS: The *in vitro* release study in AUS showed a higher release in the first 72h for the four anti-cancer drugs impregnated after this time the plateau was achieved and the stent degraded after 9 days. To determine the sensitivities to each drug (IC₅₀) TCC cell line was exposed to graded concentrations (0.01 to 2000ng/ml) of the four drugs for both 4 and 72 hours. Additionally, toxicity as a result of both direct and indirect contact of the cell lines with the different material conditions of biodegradable stent were studied. The four anti-cancer drugs studied showed a concentration-dependent inhibitory effect on the TCC and HUVEC cell lines with IC₅₀'s for paclitaxel of 7.30 ng and 501.50 ng, respectively. The TCC cell line has shown to be more sensitive than HUVEC cell line for all the anti-cancer drugs tested.

CONCLUSIONS: The direct and indirect contact of the anti-cancer biodegradable stents with the TCC and HUVEC cell lines confirm the anti-tumor effect of the stents impregnated with the four anti-cancer drugs, reducing around 75% of the viability of the TCC cell line after 72h and no killing effect in the HUVEC cells. This study has thus shown the killing efficacy of the anti-cancer drug eluting biodegradable stents *in vitro* for the TCC cell line, with no toxicity observed in the control, non-cancerous cells.

Source of Funding: APU/Jaba Recordati Grant 2015

MP23-08 HYBRID TRANSVAGINAL NOTES NEPHRECTOMY VERSUS CONVENTIONAL LAPAROSCOPIC NEPHRECTOMY: A PROSPECTIVE, NONRANDOMISED TRIAL AT A SINGLE CENTER

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INTRODUCTION AND OBJECTIVES: Recent reports have suggested that transvaginal natural orifice transluminal endoscopic surgery nephrectomy (NOTES-N) is feasible and safe, yet clinical evidence with regard to the benefits of NOTES-N are absent. The aim of this study is to present a comparison between NOTES-N and conventional laparoscopic nephrectomy (LN) with respect to perioperative outcomes, cosmetic results and quality of life.

METHODS: This was a prospective nonrandomised comparative study of all female patients undergoing NOTES-N or LN at our institution between November 2012 and March 2014. The primary outcome was pain scores on days 1-5 after surgery using the visual analog scale (VAS). The secondary outcomes included comparison of surgical results, inflammatory response, postoperative convalescence, quality of life, and cosmetic result. Patient convalescence was assessed using the Convalescence and Recovery Evaluation (CARE) questionnaire. Quality of life was measured by a 36-item Health Survey (SF-36) questionnaire. Cosmetic result was assessed using a Patient Scar Assessment Questionnaire (PSAQ). Sexual function was evaluated with the Female Sexual Function Index (FSFI). Continuous

variables with a normal distribution were analysed by Student t test. Variables without a normal distribution were analysed using Mann-Whitney U test. Categorical variables were compared using χ^2 tests.

RESULTS: We enrolled 46 patients in the NOTES-N and 41 in the LN group; the two groups were comparable for all preoperative parameters. Operative time, estimated blood loss, rate of intra- and postoperative complications were similar in the 2 groups. NOTES-N resulted in a significant decrease in pain scores on days 1-5 after surgery. The mean C-reactive protein and interleukin 6 values were higher for LN at 24 h before surgery ($p = 0.003$ and 0.01), during surgery ($p < 0.001$ for both), at the end of anaesthesia ($p < 0.001$ for both) and 24 h after surgery ($p < 0.001$ for both), respectively. The NOTES-N group demonstrated CARE higher activity scores at 2 wk ($p = 0.007$) and 4 wk ($p = 0.026$), as well as CARE higher pain scores at 2 weeks ($p = 0.012$). The PSAQ scores showed that patients who received NOTES-N were significantly more satisfied with their cosmetic results than those who had LN. No significant differences were seen between the 2 groups in 8 domains of SF-36 at 4, 8 and 12 mo postoperatively. There were no statistically significant differences in sexual function from preoperatively to 4 and 8 mo postoperatively or between NOTES-N and LN groups. The most significant limitation of this study is the lack of randomization.

CONCLUSIONS: This study adds to the existing evidence that NOTES-N is a feasible and safe surgical technique with significantly less pain, shorter LOS, shortened convalescence times, and better cosmetic result compared to LN; however, randomized trials are required to confirm benefits.

Source of Funding: none

MP23-09 ROBOT-ASSISTED LAPAROSCOPIC RETROPERITONEAL LYMPH NODE DISSECTION FOR NON-SEMINOMATOUS TESTICULAR CANCER IN THE PRIMARY SETTING: A RETROSPECTIVE MULTI-INSTITUTIONAL ANALYSIS

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INTRODUCTION AND OBJECTIVES: Robot-assisted laparoscopic retroperitoneal lymph node dissection (RA-RPLND) for testicular cancer is an advanced surgical technique that has been slow to gain acceptance due to technical challenges and concerns about patient safety and oncologic efficacy. Herein, we report a multi-institutional analysis of RA-RPLND compared to the traditional open midline approach (O-RPLND) in the primary setting.

METHODS: We conducted a multicenter, retrospective review of 117 men with non-seminomatous testicular cancer who underwent either RA-RPLND or O-RPLND in the primary setting. The robotic technique performed has been described previously. A prospective, nerve-sparing approach was used for a majority of cases. Pertinent comparisons were made between each approach.

RESULTS: From March 1999 to June 2015, 69 RA-RPLND and 48 O-RPLND were conducted in the primary setting. Patient demographics and operative times were similar between groups. RA-RPLND showed statistically better outcomes in regard to intraoperative blood loss, post-operative pain, and duration of post-operative hospitalization. A significant number of high-grade complications were noted in the O-RPLND group whereas none were noted in the RA-RPLND group. Oncologic efficacy was suggested by similarities in total number of lymph nodes obtained, presence of occult stage II disease, and overall recurrence rates between the two groups.

CONCLUSIONS: RA-RPLND for non-seminomatous testicular cancer in the primary setting is safer, less morbid, and better tolerated than the traditional open approach. Our data suggests oncologic equivalency between the two approaches substantiating the continued use of RA-RPLND to treat this select group of patients.