Podium Session 4: Lower Urinary Tract
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POD-04.01

Mirabegron Improves Patient-reported Outcomes in Patients with Overactive Bladder Syndrome: Results from a North-American Study

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Introduction and Objectives: Patient-reported outcome measures (PROs) of symptom bother, health-related quality of life (HRQoL), treatment satisfaction and disease perception are becoming increasingly important in the assessment of treatments for OAB. Mirabegron is a selective β3-adrenoreceptor agonist in development for the treatment of OAB. Herein we present PROs from a Phase III trial of mirabegron in Canada and the United States.

Methods: This 12wk, multicentre, randomized, double-blind, parallel-group, placebo-controlled, Phase III trial enrolled patients with >3mos of OAB symptoms. During a 2wk, single-blind, placebo run-in period, patients with >8 micturitions/24h and >3 urgency episodes (with or without incontinence) were randomized to receive placebo, mirabegron 50, or 100mg once daily. Co-primary endpoints were changes in the mean number of incontinence episodes/24h and micturitions/24h. Secondary variables included symptom bother, HRQoL, treatment satisfaction and perception of disease were assessed using the Overactive Bladder Questionnaire (OAB-q), Treatment Satisfaction-Visual Analog Scale (TS-VAS) and Patient Perception of Bladder Condition (PPBC).

Results: 1328 patients were randomized and received study drug (placebo n=453; mirabegron 50mg n=442; mirabegron100mg n=433). At 12 wks (or final visit), statistically significant reductions in the number of incontinence episodes and micturitions (co-primary endpoints) with mirabegron 50 and 100mg were also associated with statistically significant improvements in PROs compared with placebo (Table 1).

Conclusions: In this 12wk, North-American study of patients with OAB, mirabegron provided statistically significant improvements both in key OAB symptoms, as well as the PROs for patients perception of disease, treatment satisfaction, symptom bother and HRQoL compared with placebo.

POD-04.02

Greenlight HPS-120W vs. XPS-180W Laser Vaporization of the Prostate for Benign Prostatic Hyperplasia: a Prospective Comparative Outcomes Analysis

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Introduction and Objectives: To evaluate the safety and short-term outcome of the Greenlight XPS 180W laser system in comparison to the HPS-120W system for treating BPH in a prospective non-randomized single-centre study.

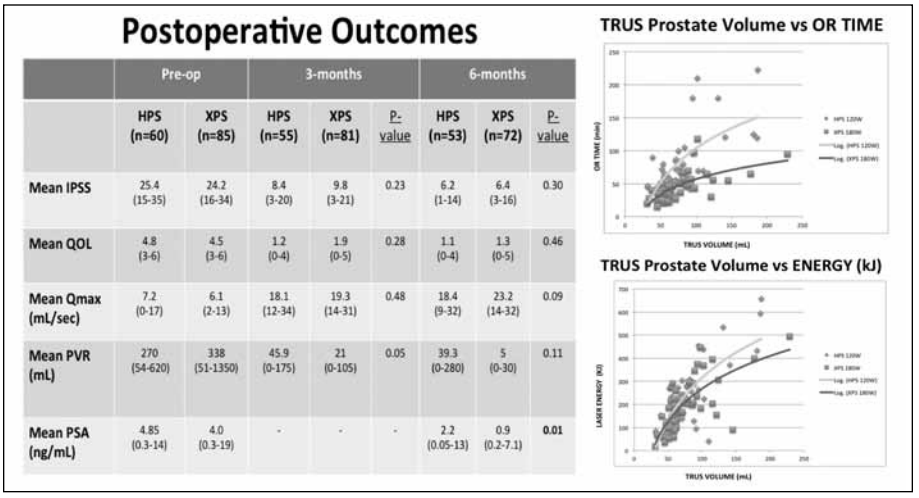
Methods: From June 2010-Sept 2011, 145 consecutive patients were included; 60 patients were treated with HPS-120W and 85 with XPS-180W laser. Perioperative variables and complications were evaluated. IPSS, Qmax, PVR, SHIM and QoIs were recorded at baseline, 1-,3- and 6-months. PSA was assessed at baseline and 6-month.

Results: Mean (range) age of the patients was 69.6 (48-87) years (HPS) and 67.2 (50-85) years (XPS), with a mean preoperative TRUS volume of 81.7 (31-187) and 78.2 (33-229) mL, respectively. Patient preoperative characteristics were comparable including retention rate (52% and 47%, respectively). Mean operative duration was significantly shorter for the XPS group (79 vs. 44.2 min; $p<0.01$) as was mean laser time (37 vs. 24 min; $p<0.01$). Mean energy delivery was however comparable between HPS and XPS groups (222.5 vs. 188.7 KJ; $p=0.12$). Mean fibre use (1.6 vs. 1.0; $p<0.01$) and 3L Saline bags (4.1 vs. 7; $p<0.01$) were significantly lower for the XPS group. The rate of visual impairment from bleeding (3% vs. 4%; $p=0.74$) and prostate capsule perforation (0% in each), were comparable. There were no significant differences in 30-day complication rate including

Table 1. POD-04.01. Adjusted mean* (standard error) change from baseline to final visit

	Placebo	Mirabegron 50 mg	Mirabegron 100 mg
Co-primary endpoints			
Number of incontinence episodes/24h§	-1.13 (0.112)	-1.47† (0.114)	-1.63† (0.117)
Number of micturitions/24h§	-1.05 (0.132)	-1.66† (0.133)	-1.75† (0.135)
Secondary variables: patient-reported outcomes			
Treatment satisfaction (TS-VAS)¥	0.7 (0.16)	1.5‡ (0.16)	2.1‡ (0.16)
Symptom bother (OAB-q)§	-10.8 (0.97)	-17.0‡ (0.98)	-20.2‡ (0.99)
HRQoL score (OAB-q)¥ Total	10.7 (0.89)	14.8‡ (0.90)	17.3‡ (0.90)
Coping	12.8 (1.06)	16.9‡ (1 .07)	19.1‡ (1.08)
Concern	12.7 (1.03)	18.0‡ (1.04)	20.5‡ (1 .05)
Sleep	9.7 (1.07)	14.6‡ (1.08)	17.5‡ (1.09)
Social interaction	6.0 (0.77)	7.4 (0.77)	9.6‡ (0.78)
PPBC§	-0.5 (0.05)	-0.7‡ (0.05)	-0.8‡ (0.05)

*Least squares mean adjusted for baseline, gender and geographical region; $p<0.05$ versus placebo † with or ‡ without multiplicity adjustment; §Negative change indicates improvement; ¥ Positive change indicates improvement.



Postoperative Outcomes

	Pre-op		3-months			6-months		
	HPS (n=60)	XPS (n=85)	HPS (n=55)	XPS (n=81)	P-value	HPS (n=53)	XPS (n=72)	P-value
Mean IPSS	25.4 (15-35)	24.2 (16-34)	8.4 (3-20)	9.8 (3-21)	0.23	6.2 (1-14)	6.4 (3-16)	0.30
Mean QOL	4.8 (3-6)	4.5 (3-6)	1.2 (0-4)	1.9 (0-5)	0.28	1.1 (0-4)	1.3 (0-5)	0.46
Mean Qmax (mL/sec)	7.2 (0-17)	6.1 (2-13)	18.1 (12-34)	19.3 (14-31)	0.48	18.4 (9-32)	23.2 (14-32)	0.09
Mean PVR (mL)	270 (54-620)	338 (51-1350)	45.9 (0-175)	21 (0-105)	0.05	39.3 (0-280)	5 (0-30)	0.11
Mean PSA (ng/mL)	4.85 (0.3-14)	4.0 (0.3-19)	-	-	-	2.2 (0.05-13)	0.9 (0.2-7.1)	**0.01**

Fig. 1. POD-04.02.

dysuria (17% vs. 21%), incontinence (3.3% vs. 3.5%), retention (5% vs. 7%), retrograde ejaculation (65% vs. 60%) or erectile dysfunction (1.6% vs. 2.3%). With a mean follow-up of 11.8 and 7.5 months, no urethral strictures or retreatments were observed. Clinical follow-up is summarized in Fig. 1. 6m-PSA reduction was significantly greater for the XPS group (54% vs. 78%; $p<0.01$).

Conclusions: Both Greenlight systems provide safe and effective tissue vaporization properties with significant clinical relief of BPH obstruction. The XPS-180W laser system appears to be more favorable with regards to reduced operative time, fibre need and PSA-reduction suggesting more effective tissue removal.

POD-04.03

Changes in Erectile Function after Photoselective Vaporization of the Prostate for Benign Prostatic Hyperplasia

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Introduction and Objectives: Although photoselective vaporization of the prostate (PVP) has been shown to improve voiding function in men with benign prostatic hyperplasia (BPH), its effect on erectile function is unknown. The purpose of this study was to characterize changes in erectile function in men undergoing PVP.

Methods: This analysis was conducted on the PVP arm of a non-randomized clinical trial comparing PVP and TURP. All procedures were performed by one surgeon using a 120W GreenLight HPS laser. Subjects completed the Sexual Healthy Inventory for Men (SHIM) and International Prostate Symptom Score (IPSS) prior to surgery and at 6 months post-surgery. Data was collected prospectively and associations between change in SHIM and other clinical variables were tested using the Spearman rank correlation coefficient for continuous variables and the Wilcoxon-Mann-Whitney or Kruskal-Wallis tests for categorical variables. Tests of association were two-sided and performed at a level of significance of .05.

Results: 140 men were included in the analysis. Preoperative SHIM negatively correlated with age (Spearman's r=–0.33, $p<0.001$) but not preoperative IPSS or any other clinical variables. Mean SHIM decreased by 0.9 after PVP, but wide variation was seen, with 39% showing an increase, 16% showing no change and 45% showing a decrease. The only significant predictor of change in SHIM was change in IPSS (Spearman's r=–0.18, $p=0.03$), with men experiencing a greater improvement in voiding symptoms also reporting better postoperative erectile function. There was no significant correlation between change in SHIM and age ($p=0.62$), duration of symptoms ($p=0.31$), preoperative BPH medical therapy ($p=0.96$), PDE5-inhibitor therapy ($p=0.80$) or total energy used ($p=0.55$).

Conclusion: Erectile function outcomes following PVP are variable but correlate positively with the degree of improvement in voiding function. Biologic mechanisms linking erectile and voiding function are poorly understood and deserve further study.

POD-04.04

A Prospective Analysis of Consultation for Difficult Urinary Catheter Insertion at Tertiary Care Centres in Northern Alberta

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Introduction and Objectives: Difficult urinary catheterization is a frequent reason for urologic consultation. Literature regarding difficult urinary catheterization is limited. The objective of the study is to examine the current practice pattern of difficult catheter insertion and to identify strategies that may reduce its incidence and related adverse events.

Methods: This is a prospective observational study of consultation for difficult catheter insertion at tertiary care centres in Edmonton, Alberta between Oct 2010 and Feb 2011. All urologic consultations for difficult catheter insertion in adults at the University of Alberta and Royal Alexandra Hospitals were enrolled. Patients were managed according to the current regional standard of care established prior to the study. A clinical encounter questionnaire (CEQ) was completed by the urology service regarding the details of the consultation and patient factors. CEQ results were tabulated and analyzed for trends, areas of strengths and weakness in the present consultation process.

Results: Eighty-nine patients were accrued to the study. Mean age was 67 years and 91% were male. Seventeen percent of patients had a history of previous difficult catheterization and 65% had a urologic history. Forty-two percent of patients had catheter placement without any auxiliary tools. Adverse events were experienced by 37% of patients including urosepsis, bladder perforation, hydrouterus, paraphimosis and urethral trauma. Thirty-three percent of patients had a significant urethral injury as a result of catheterization attempts. Forty-one percent of consultations were classified as inappropriate and 53% occurred between the hours of 5pm and 6:30am.

Conclusions: Difficult urinary catheterization is associated with significant patient morbidity and may often be preventable. This study highlights the need for implementation of preventative strategies, widespread education and increased awareness regarding catheter care.

POD-04.05

A Novel Urethral Catheter Design for Safer Placement and Outcomes

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Introduction and Objectives: The incidence of iatrogenic urethral injury from urethral catheter balloon inflation is not reported in the literature. Our experience at a high-volume tertiary academic medical centre suggests that this occurs on a regular basis. Most commonly, catheter placement is performed by nurses. Catheter design has not changed in over 30 years. We sought to: (1) Estimate the incidence by assessing the U.S. national incidence of non-infectious catheter related complications; and (2) Create and test a novel catheter design to mitigate urethral trauma caused by inappropriate catheter inflation within the urethra.

Methods: We performed a cross-sectional analysis of the 2006 to 2008 National Inpatient Sample (a 20% stratified sampling of non-federal U.S hospitals), using ICD-9-CM codes. BARD® 16 Fr. catheters were modified by thinning out a circumferential area of the balloon-port shaft, and painting this area red. When the retention balloon is inflated within the urethra, this thinned area ("Safety Balloon") expands, to: (1) Minimize pressure upon the urethra, and (2) Alert the operator. Ink markings were made on the catheter shaft, to indicate to the user to advance the catheter to the hub. We measured pressure within the balloon-port during inflation in the bladder and urethra of fresh human cadavers.

Results: From 2006 to 2008, up to 111,353 patients experienced a non-infectious catheter related complication. Most were male (86.6%) and 46.2% required a procedure, such as cystoscopy or suprapubic tube placement. Balloon-port pressure after inflation within the bladder was similar among standard catheters and our design prototypes (60 kPa ± stedev). The "safety balloon" expanded immediately upon filling within the urethra.

Conclusions: Non-infectious catheter related complications occur regularly. The simple catheter design modifications we describe foster safer placement and may significantly reduce injury from urethral balloon-inflation.

POD-04.06

Urethroplasty for Pelvic Fracture Urethral Distraction Defects (PFUDD): Factors Influencing Surgical Outcome and Erectile Dysfunction

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Introduction and Objectives: PFUDD is a challenging urologic entity. Complications of this injury include urethral stricture, erectile dysfunction (ED) and incontinence. Controversy exists as to the best initial management and factors determining optimal outcome. The purpose of this study is to identify factors that influence ED and successful surgical repair.

Methods: A retrospective database review of 536 urethral reconstructions was performed. Factors examined were cause of pelvic fracture, aligning catheter placement, age, comorbidities, previous intervention, length of defect, infrapubectomy, and time from injury to repair. Primary outcomes were urethral patency and the occurrence of ED.

Results: 49 patients underwent urethroplasty after PFUDD during the study period. Mean age was 40.4 years with average follow-up of 3.3 years. Motor vehicle collision (77%) was the most common etiology. Urethroplasty alone established urethral patency in 85% of patients. Seven patients (14%) developed recurrent stenosis. Almost all of these recurrences (6/7, 86%) were salvaged by a single endoscopic procedure. One patient required repeat urethroplasty. Placement of an aligning catheter at the time of injury did not decrease stricture recurrence (11 vs. 13% p=0.43) but increased the rate of ED (84 vs. 56% p=0.03). A failed attempt at aligning catheter placement substantially increased the risk of ED (91 vs. 56% p=0.04) but did not decrease stricture recurrence (27 vs. 13% p=0.17).

Conclusions: PFUDD injuries are amenable to repair by a single urethroplasty in 85% of cases. The majority of recurrences (86%) can be treated with a single endoscopic technique. Overall urethral patency after these injuries is 98%. Placement of aligning catheter at time of injury increases the rate of ED without improving operative outcome. There is evidence that a failed attempt at urethral realignment (likely reflecting severity of injury) highly predicts the occurrence of ED.