Male LUTS

Dr. Brian Ho
Division of Urology
Department of Surgery
Queen Mary Hospital
Mr. Siu  M/78

- Known to have HT & DM since 2008 on follow up with General Out-Patient Clinic (GOPC)

- Noticed to have worsening RFT in GOPC
  - From Cr 191 umol/L to Cr 262
  - MSU: normal
  - HbA1c 6.1% (static)
  - Good drug compliance
  - No active complaints from patient
Mr. Siu M/78

Past Medical History:

- HT
- DM, previously on diamicron but switched to insulin in view of deteriorating RFT
- Alzheimer’s disease
- Hyperlipidemia
- Vit B12 deficiency

- Currently living in an old age home
Mr. Siu  
M/78  
USG Urinary system  
(May 2014)
Mr. Siu M/78

- USG (May 2014):
  - Marked hydronephrosis and hydroureter (right > left)
  - Renal parenchymal disease & right cortical thinning
  - Enlarged prostate

- Thus, patient was admitted to QMH and urology was consulted
Mr. Siu  M/78

- Foley’s catheter had been inserted
  - 1st cath volume 1450mL
  - Post-obstructive diuresis seen

- DRE: 40gm prostate, no nodules, median groove preserved

- Creatinine improved from 266umol/L to 164umol/L after Foley’s catheterization
Mr. Siu  M/78

USG Urinary system
(June 2014)
Mr. Siu  M/78
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M/78
Mr. Siu M/78

Filling Phase (50mL/min):
- 1st desire 343mL, normal desire 390mL, strong desire 473mL
- Terminal overactive detrusor
- Borderline compliance (13cmH₂O at 322mL)
  - Δ24.8mL/cmH₂O
- Relatively smooth bladder outline
- No VUR
- MCC at 506mL due to urgency
Mr. Siu M/78

Voiding phase:
- Volitional voiding
- Bladder neck & prostatic urethra remains closed
- Voided volume 98mL
- $P_{det} = 72\text{cmH}_2\text{O}$ at $Q_{max} = 3.5\text{mL/s}$
- BOOI = 65
- BCI = 89.5
- Residual Urine: 400mL
Mr. Siu  M/78
ICS Nomogram

- Derived from the Abrams-Griffiths nomogram
- Determines whether there is bladder outflow obstruction
- May predict success rate of TURP

- Robertson et al (1996)
  - 79% of obstructed pts had subjective good outcome
  - 40% of non-obstructed pts had subjective good outcome

- Seo et al (2006)
  - 93% of obstructed pts had successful outcome
  - 64% of non-obstructed pts had successful outcome
  - Success defined as $Q_{\text{max}} > 15\text{mL/s}$, $RU < 100\text{mL}$, or $>50\%$ reduction in IPSS
Bladder Contractility

- ICS classification (2002)
  - Normal
  - Under-activity: a contraction of reduced strength and/or duration, resulting in prolonged bladder emptying and/or failure to achieve complete bladder emptying within a normal time span
Bladder Contractility Index

- Derived from Schafer’s normogram (1995)

\[ \text{BCI} = P_{\text{det@Qmax}} + 5 \times Q_{\text{max}} \]

- >150 = strong
- 100-150 = normal
- <100 = weak
Bladder Contractility Index

- Seki et al (2006 J Urol)
  - 88 pts with detrusor underactivity (BCI ~85) with 12 months follow up
  - Patients with underactivity generally had poor outcomes after TURP when compared to general male population
    - IPSS improvement of 48% (vs 70-80%)
    - Qmax improvement of 64% (vs 115%)
Mr. Chau  M/66

Patient seen in January 2014
- Referred from Dept. of Medicine for lower urinary tract symptoms (LUTS) for 6 months

- Chief complaint is frequency of urination
  - Daytime voiding ranges from every 30 – 60mins

- No urgency
- Nocturia 2-3x / night
- Fair stream
- Occasional intermittency
- Involuntary leakage of urine on stress and occasionally on prolonged standing
- Use of tissue paper for protection during daytime
- Nocturnal enuresis requiring diapers at night time
Mr. Chau  M/66

Past Medical History
- Chronic rheumatic heart disease on warfarin
- History of right inguinal hernia repair
- Ca rectum with laparoscopic LAR + loop ileostomy in June 2013
  - Pathology: pT3N1
  - Required adjuvant chemotherapy and completed in Dec 2013
- PET-CT (Dec 2013): no local recurrence or distant metastases. No hydronephrosis or urinary stones.
Mr. Chau  M/66

Physical Examination
- General examination unremarkable
- Abdomen: soft with ileostomy, no abdominal mass nor palpable bladder
- DRE: normal anal tone, 25gm prostate, mildly indurated but no tenderness
Mr. Chau  M/66

Investigations
- Complete blood counts: normal
- Creatinine: 76 umol/L
- Liver function tests: normal
- INR: 1.4
- PSA: 1.2 ng/mL
- MSU: Klebsiella, sensitive to augmentin (amoxicillin + clavulanic acid)
Mr. Chau M/66

- Patient was given one week course of augmentin
- However, symptoms persisted
Uroflowmetry

**Results**
- Average flow rate: 1.9 ml/s
- Maximum flow rate: 8.7 ml/s
- Time to maximum flow: 1.0 s
- Voided volume: 90.0 ml
- Flow time: 41.8 s
- Voiding time: 51.0 s
- Intervals: 4

**Comments**
- Ru: 378 ml (by bladder scan)
- Double void 50 ml
Mr. Chau M/66

- In view of the significant residual urine despite repeated voiding, patient was taught clean intermittent self catheterization (CISC)

- Video urodynamics study was arranged
## Bladder Diary

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**Total Water Intake:** 2050 ml

**Total Urine Output:** 1500 ml

**Total Bowel Movements:** 10

**Note:** Includes all liquid drinks, tea and water.
VUD
VUD
VUD

Filling phase  (initially 50mL/min down to 10mL/min)
- Decreased bladder compliance with Pdet ~18cmH$_2$O at 208mL
  - $\Delta$11.6 mL/cmH$_2$O
- Impaired bladder sensation
- Bladder neck and prostatic channel wide open from beginning
- Urine leakage noted since 50mL infused
- ALPP 25 cmH$_2$O
- Bladder capacity 170mL
  - Unable to further fill up bladder
VUD

Voiding phase
- No sustained detrusor contraction demonstrated
- Voided 50mL with valsalvar maneuver only
- $P_{\text{det}}$ 25cmH$_2$O at Qmax of 4.1mL/s
- BOOI 16.8
- BCI 45.5
- Residual urine 100mL
VUD

Impression:
- Intrinsic sphincter deficiency
- Hypocontractile bladder
- Low bladder compliance
Innervation of the Male Lower Urinary Tract

- Sympathetic innervation (T10-L2) travels as hypogastric nerves
- Parasympathetic innervation (S2-4) travels as nervi erigentes to pelvic plexuses
- Somatic component of the parasympathetic (from the Onuf’s nucleus in S2-4) travels with the parasympathetic nerves
- Somatic innervation (S2-4) travels as the pudendal nerve
Summary

- Intrinsic sphincter deficiency
  - Peripheral sympathetic + parasympathetic and/or pudendal nerve injury

- Hypocontractile bladder
  - Injury to peripheral parasympathetic nerves

- Low bladder compliance
  - Partial injury to peripheral parasympathetic nerves
Summary

- Be wary of LUTS in patients who have history of pelvic surgery
- When faced with atypical clinical presentations, important to keep alternative diagnoses in mind
  - And to investigate for these alternative diagnoses
References


