Diagnosis and Treatment of Urinary Incontinence after Orthotopic Ileal Neobladder in China

I. Introduction
   a. Gold Standard for treatment of muscular invasive bladder cancer, or high-risk non-muscular invasive bladder cancer is radical cystectomy and urinary diversion
   b. Three types of urinary diversion:
      i. Orthotopic neobladder (39-74% of neobladder surgeries)
      ii. Ileal conduit or sigmoid conduit
      iii. Cutaneous Ureterostomy

II. Factors Affecting Incidence of Urinary Incontinence after Orthotopic Neobladder Surgery
   a. Post-op Evaluation Time- 6-12 and 24 months to allow more stable bladder capacity
   b. Age of patient
   c. Method of Surgery
      i. Orthotopic ileal Cystoplasty
      ii. Sigmoid Cystoplasty- nocturnal incontinence 51% lower than after ileal
         *Note that a more recent Meta-Analysis showed that “daytime and nighttime continence rates were significantly better in ileal group than in sigmoid group” (Tao et al., 2016)*
      d. Intraoperative preservation of nerves- improves “Controllability of Continence” by 5%

III. Categories of Urinary Incontinence- urine outflow without self-determination

IV. Diagnosis of Urinary Incontinence
   a. Medical history, Questionnaire, and Voiding Diary
   b. Physical Examination, Lab Tests

V. Treatment of Urinary Incontinence
   a. Conservative
      i. Pelvic Floor Muscle Training
         1. Training should continue 8-12 months post-operatively
         2. Evaluate Strength and Endurance of pelvic floor muscles, contraction ability with increased intraabdominal pressure, biofeedback to assist
         3. Perform exercise at least once a day, even if continence is present
      ii. Bladder Training- Void at regular intervals, restrict water intake 3 hr before bed
      iii. Medical Treatment (Pharmacology)
         1. Anticholinergic Agents
         2. Antidiuretics
         3. Imipramine
   b. Surgical
      i. Indications- Low urethral closure pressure or abdominal leak point pressure, and medication ineffective
      ii. Types
         1. Urethral Bulking Agents
         2. Artificial Urethral Sphincter Implantation
         3. Pubovaginal Sling
**Description of Neobladder Surgery**

To create a neobladder, the cancerous bladder is first removed via abdominal incision or robot-assisted laparoscopic approach. They use a section of the small intestine (ileal), colon (sigmoid), or a combination to create the new bladder. The new bladder is attached to the ureters and placed in the same position as the original bladder. The kidneys can now drain directly into the neobladder. The other end is attached to the urethra, allowing the person to maintain urinary control.

**Case Study**

The patient is a 62 y.o. male. Comorbidities include umbilical hernia, peripheral arterial disease, bilateral hearing loss due to Meniere’s, hemorrhoids with hx of 2 banding repairs. He is also a long-term smoker.

He went to the ER in May 2019 for right flank pain that he thought was a kidney stone, later found to be cancerous lesion of the bladder. In late 2019 he had 6 rounds of BCG immunotherapy treatment (Bacillus Calmette-Guérin). Despite the BCG treatments, the tumor was continuing to grow. He now was having decreased urine volume, difficulty urinating, dysuria, and constant R flank pain. They decided to remove the bladder. On 3/31/20 the pt had a radical cystoprostatectomy with ileal orthotopic neobladder and bilateral pelvic lymphadenectomy. He recovered well and was discharged on 4/5/20.

**Physical Therapy Evaluation 5/5/20:**

Pt has been wearing 7-8 diapers/day. He can feel and hold urine if he directly thinks about it, but if his mind strays he will constantly leak. He has been self-cathing 2x/day as instructed by physician but will only get “maybe a teaspoon.” He drinks “plenty of fluid” due to mucus from neo bladder.

Nighttime: Sets an alarm to get up because diaper overflows and he needs to change it.

UDI Score: 58.3%

External Palpation: Abdominal fascial tension R diaphragm, bilat psoas, stiff vertical scar from umbilicus to pubic bone

PERF test: 3/10/10/6

Muscle Substitution: None

Intrarectal Muscle Palpation:
Pubococcygeus: tightness of both R and L
Iliococcygeus: tightness of both R and L
Limited ROM noted during contraction/relaxation assessment, but no pain reported.

I provided him an initial HEP of piriformis stretch, adductor (butterfly) stretch, single knee to chest, and diaphragmatic breathing. Due to his ability to somewhat control urine for short periods of time, and to help with stretching the neobladder, he started a 30 minute timed voiding schedule. Goals included improving independence with the dropping motion of his pelvic floor, being able to verbalize bladder irritants and modify accordingly, decreasing nocturia to 1-2 times per night without diaper overflow, and being able to increase voiding intervals to 3 hrs.

**Follow Ups:** 6 total visits as of 6/24/20

Treatments included neuromuscular re-education, therapeutic exercise, and therapeutic activities typical of a mixed incontinence-type patient with modifications due to initial increased tone of pelvic
floor. Neobladder voiding education is to relax pelvic floor and use a Valsalva or external manual pressure to assist in draining bladder.

Surface EMG biofeedback confirmed a high resting tone of the patient’s pelvic floor at 5.0 uV. He had difficulty dropping his pelvic floor with cuing, but did reduce to 3.0 uV with muscle fatigue after activity. By visit number five his surface EMG had reduced to 2.0 uV and he was up to a 1 hr and 15 min voiding interval. He was no longer self-cathing as the residual volume was so low.

He is now doing 2 hr voiding intervals and able to go without a diaper on weekend days when he is not working (home construction business). Nocturnal enuresis continues to be an issue with 2 diapers used per night.

Discussion Questions:
1. After reading the article, what questions do you still have regarding physical therapy and neobladder?
2. What has your experience been working with people post neobladder operations?
3. What research would you like to see to improve the literature on physical therapy and neobladders?

Citations:


Other Helpful Resources:
- Q&A with a patient who has recovered from neobladder surgery: https://bcan.org/assets/Neobladder-Q-A.pdf

Other Helpful Research Articles:
- Welch, Jacquelyn L.; Schoenberg, Mark P.; Haisfield-Wolfe, Mary Ellen; Huang, Yi. Improving Continence after Cystectomy with Neobladder Reconstruction; J WHPT 29:1, April 2005, p. 34