### W21: Urinary Retention in Women

**Workshop Chair:** David Castro-Diaz, Spain  
**12 September 2017 15:30 - 17:00**

<table>
<thead>
<tr>
<th>Start</th>
<th>End</th>
<th>Topic</th>
<th>Speakers</th>
</tr>
</thead>
<tbody>
<tr>
<td>15:30</td>
<td>15:40</td>
<td>Concepts &amp; Pathophysiology: The Urologist Point of View</td>
<td>David Castro-Diaz</td>
</tr>
<tr>
<td>15:40</td>
<td>15:55</td>
<td>Voiding dysfunction after delivery and pelvic surgery</td>
<td>Montserrat Espuña-Pons</td>
</tr>
<tr>
<td>15:55</td>
<td>16:10</td>
<td>Evaluation and diagnosis</td>
<td>Tufan Tarcan</td>
</tr>
<tr>
<td>16:10</td>
<td>16:20</td>
<td>Conservative management</td>
<td>Cristina Naranjo-Ortiz</td>
</tr>
<tr>
<td>16:20</td>
<td>16:40</td>
<td>Medical and Surgical Treatment</td>
<td>Christopher R Chapple</td>
</tr>
<tr>
<td>16:40</td>
<td>16:55</td>
<td>Discussion</td>
<td>All</td>
</tr>
<tr>
<td>16:55</td>
<td>17:00</td>
<td>Take Home Messages</td>
<td>David Castro-Diaz</td>
</tr>
</tbody>
</table>

### Speaker Powerpoint Slides

Please note that where authorised by the speaker all PowerPoint slides presented at the workshop will be made available after the meeting via the ICS website [www.ics.org/2017/programme](http://www.ics.org/2017/programme). Please do not film or photograph the slides during the workshop as this is distracting for the speakers.

### Aims of Workshop

Urinary retention in women is rare and diverse. Diagnostic criteria are not agreed and epidemiology is not well known. Forms of urinary retention in women include: complete retention, incomplete or insufficient emptying and elevated post-void residual. It may be acute or chronic, symptomatic or asymptomatic. Aetiology is multifactorial including anatomic or functional bladder outlet obstruction and bladder dysfunction related to neurological diseases, diabetes mellitus, aging, pharmacotherapy, pain and infective/inflammatory disease and idiopathic or unknown aetiology. This workshop will analyse and discuss physiopathology, evaluation and management of urinary retention in women from an integral, practical and evidence based approach.

### Learning Objectives

1. To identify aetiology, risk factors and pathophysiology of urinary retention in women.
2. To evaluate urinary retention in women.
3. To become familiar with the different options for the management of urinary retention in women including conservative, medical and surgical therapies.

### Learning Outcomes

After this workshop attendants will be able to identify the different etiologies and risk factors contributing to the development of urinary retention in women such as neurogenic, metabolic, surgical, pharmacological or idiopathic causes. In addition attendants will become aware of the diagnostic tools and parameters to establish the appropriate diagnosis as well as the several therapeutic modalities from conservative and pharmacological measures to surgical ones.

### Target Audience

Urologists, Gynaecologists, Physiotherapists, Nurses, Health care givers and all delegates with interest in the management of urinary retention in women.

### Advanced/Basic

Advanced

### Conditions for Learning

In the second part of the workshop, participants will be actively involved in the diagnosis and management of real life clinical cases of urinary retention including diagnostic and therapeutic aspects in a very interactive manner.

### Suggested Learning before Workshop Attendance


Factors Associated with Incomplete Bladder Emptying in Older Women with Overactive Bladder Symptoms.  
Park J1, Palmer MH2.

Urinary retention in elderly women: diagnosis & management.  
Malik RD1, Cohn JA, Bales GT.

Urinary retention and uterine leiomyomas: a case series and systematic review of the literature.  
Wu CQ1, Lefebvre G, Frecker H, Husslein H.

Urinary retention in women.  
Juma S1.

Dysfunctional voiding.  
Artibani W1, Cerruto MA.

Suggested Reading
1.- Urinary retention.  
Hernández Hernández D, Tesouro RB, Castro-Diaz D.  


3.- Lower Urinary Tract Symptoms and Aging: The Impact of Chronic Bladder Ischemia on Overactive Bladder Syndrome.  
Camões J, Coelho A, Castro-Díaz D, Cruz F.  

4.- How can we measure bladder volumes in women with advanced pelvic organ prolapse?  
Cassadó J, Esuña-Pons M, Díaz-Cuervo H, Rebollo P; GISPEM Group..  

5.- Bladder function after radical hysterectomy for cervical cancer.  
PMID: 24519734

6.- Evaluating the results of stress urinary incontinence surgery with objective and subjective outcome measures.  
Diez-Itza I, Esuña-Pons M; Grupo de Investigación de Disfunciones de Suelo Pélvico en Mujer–GISPEM..  

7.- Safety and efficacy of retropubic or transobturator midurethral slings in a randomized cohort of Turkish women.  
Tarcan T, Mangir N, Sahan A, Tanidor Y, Sulukaya M, ?lker Y.  
PMID: 25170535

Similar articles  
Select item 23757108

PMID: 23757108

Similar articles  
Select item 24175037

9.- Management of complications after tension-free midurethral slings.  
Çetinel B, Tarcan T.  
PMID: 24175037
10. What is normal bladder neck anatomy?
Naranjo-Ortiz C, Shek KL, Martin AJ, Dietz HP.
PMID: 26700104

Similar articles
Select item 23269334

11. Urodynamic approach to female urinary incontinence refractory to treatment with anticholinergics.
PMID: 23269334

Nambiar AK, Lemack GE, Chapple CR, Burkhard FC; European Association of Urology..


Smith PP, Birdier LA, Abrams P, Wein AJ, Chapple CR.

**Speaker 1: David Castro-Diaz, Urologist (Spain)**

**Concepts & pathophysiology**

Urinary retention in women, in contrast to men, is rare and diverse; diagnostic criteria are not agreed and the epidemiology is not well known. The reported male to female ratio on urinary retention is 13:1, and the incidence is approximately 7 per 100,000 population per year. Forms of urinary retention and bladder emptying disorders in women include: complete retention, incomplete or insufficient emptying and elevated post-void residual. It may be acute or chronic, symptomatic or asymptomatic as explained above. There are many causes of urinary retention in women, but we will be more emphatic on the two most common causes in the neurologically healthy women: pelvic floor dysfunction, or dysfunctional voiding, and primary bladder neck obstruction.

**Aetiology of urinary retention in women**

There are anatomical and functional causes of urinary retention in women. Anatomic causes can be related to iatrogenic procedures (urinary retention surgery or colorectal and gynaecological surgery) and to abnormalities due to obstruction by pelvic organ prolapse, gynaecologic tumours, caruncle, urethral diverticulum, ectopic ureterocele, etc.). Urinary retention due to functional disorders is related to bladder dysfunction or bladder outlet dysfunction. Bladder dysfunction may be related to detrusor underactivity, acontractile bladder or failure of sphincter relaxation. Female urinary retention due to bladder outlet dysfunction is usually due to two main entities: primary bladder neck obstruction and dysfunctional voiding. Besides these, there are rare causes reported, such as cytomegalovirus cystitis, eosinophilic cystitis, inflammatory nervous disease, incarcerated gravid retroverted uterus (6), which offer variable characteristics to this entity. To properly empty the bladder, during the voiding phase of the micturition cycle, a sufficient strength and duration of the detrusor activity is needed. Any kind of disorder affecting the strength or duration of the detrusor contraction, an increase in the outlet resistance or the poor coordination between the bladder (detrusor) and the bladder outlet (sphincter) may cause an insufficient emptying or a urinary retention in women.

**Speaker 2: Montse Espuña-Pons, Gynaecologist (Spain)**

**Voiding dysfunction after delivery and radical pelvic surgery**

**Introduction**

Urinary retention (UR) in women is a common clinical situation in postpartum and after radical pelvic surgery for a gynaecological cancer. UR in these patients can be only a transient problem or may be the aetiology of a persistent voiding dysfunction.

**Postpartum urinary retention (PUR)**

In the puerperium, PUR is a common finding which may increase the risk for persistent voiding dysfunction. Possible risk factors for PUR are: primiparity, C-section procedure, birth weight, epidural analgesia, opioid analgesia, episiotomy and large perineal tears.

Two clinical situations may be observed:
A- Women who are unable to void spontaneously after a few hours of giving birth and (acute symptomatic urinary retention).

B- Women with abnormal post-void residual volume (PVR) detected by ultrasonography or by catheterization after spontaneous micturition, with a spontaneous recovery after several days.

The prevalence of acute symptomatic retention defined as inability to void after 6 hours of vaginal delivery or after removal a catheter after caesarean section is low. Nearly half of the women may have a PVR > 150 ml. after the first spontaneous void in immediate postpartum.

Women empty their bladders by relaxing the pelvic floor without a strong detrusor contraction.

The pathophysiology of PUR is not well documented, but some suggestions may explain part of the problem. After a vaginal delivery, important changes in the anatomy and functionality of the pelvic floor may and also some possible low urinary tract obstructive causes (vaginal periurethral edema) may occur. Epidural analgesia directly affects bladder sensitivity and contractility.

**Voiding dysfunction after radical pelvic surgery**

Radical Hysterectomy (RH) and bilateral pelvic lymphadenectomy is the most common and internationally accepted surgical treatment for cervical and has been considered as standard surgical treatment for stages IB1-IIA over the past 30 years, with a high 5-years survival rate (88-97%). Extensive pelvic surgery may result in damage of pelvic vascularization and autonomic innervation and consequently long term pelvic organ dysfunction side effects are common. Functional disorders of the lower urinary tract (LUT) are the most common long-term side effects, with a high postoperative incidence of bladder dysfunction. Nowadays there is a tendency to an individualization of the treatment reduce the morbidity of surgery. There are two phases of the dysfunctions of the LUT in the postoperative period after RH related to the extent of damage of the autonomic innervation. In the immediate postoperative period, there is usually a transient spastic bladder with a decreased capacity but also with diminished sensation which causes voiding dysfunction and may require urethral catheterization for a few days or few weeks. After this period the patient may recover an efficient voiding function, with some changes in bladder sensation and in detrusor and urethral function, but without any symptoms. An over-distended bladder in the immediate postoperative period may generate a persistent hypo-contractile bladder and it’s the cause of persistent voiding dysfunction in some patients after radical pelvic surgery. These women have LUT symptoms and need abdominal straining for void.

**Speaker 3: Tufan Tarcan, Urologist (Turkey)**

**Evaluation and Diagnosis**

**Introduction:**

There is no strong consensus on the evaluation of female urinary retention (FUR) since the pathophysiology is poorly understood. The aetiology may include transient causes, detrusor underactivity, increased outlet resistance (mostly iatrogenic), psychogenic and mixed causes. Urinary retention remains to be a well-known complication of anti-incontinence surgery. The temporal relation between surgery and FUR is the most important diagnostic factor for the iatrogenic obstruction. In unexplained or chronic cases, a multidisciplinary teamwork is favoured including a urologist, physiotherapist, neurologist, gynaecologist, psychiatrist, gastroenterologist/general surgeon.

**Basic evaluation:**

The initial goal of evaluation is to ensure bladder emptying until evaluation is completed and management of retention is succeeded. Foley catheterization is usually the choice for acute retention. Clean intermittent catheterization (CIC) should be preferred for periods longer than one week. Long-term indwelling catheterization is advised only for frail patients when CIC cannot be performed.

The evaluation should then include assessment of the upper urinary tract (UUT) and take the necessary measures to prevent any further damage during evaluation process. Bladder emptying with CIC is the mainstay of UUT protection. Ultrasound is the basic imaging modality to assess the UUT. Renal function tests are needed in long term retention.

The evaluation should continue to find out the aetiology of FUR. FUR will resolve in a group of patients just with CIC after transient factors are eliminated.

Transient causes of FUR are:

- Immobility (especially postoperative)
- Constipation or faecal impaction
- Medications
- Urinary tract infections
- Delirium
- Endocrine abnormalities
- Psychological problems
- Clot retention

Invasive tools such as invasive urodynamic studies (UDS) or cystoscopy should be delayed if transient causes are present. In fact, half of the women presenting with retention will void normally after transient factors are eliminated. In chronic cases, some pts may not be aware of retention whereas there is high level of anxiety in acute cases. There is a specific event that triggers FUR in
about half of the patients. Besides a detailed history, the physical examination should include abdominal and sacral examination, pelvic examination, focused neurological examination. Cystoscopy is usually advocated to rule out any anatomic obstruction.

**Urodynamic evaluation:**
Non-invasive urodynamic studies such as uroflowmetry and PVR measurement can be utilized in pts who are not in complete retention. Cystometry and pressure flow studies (PFS) usually reveal detrusor underactivity (DUA) as the most common finding. Video-urodynamics should be preferred when available. Since no test can accurately differentiate neurologic from non-neurologic female urinary retention, careful neuro-urodynamic evaluation will help guide to more appropriate management.

PFS aim to diagnose bladder outlet obstruction which is however more difficult in women compared to men. Women empty their bladders by relaxing the pelvic floor, sometimes with the additional help from the abdominal muscles without a strong detrusor contraction in contrary to men. Therefore, small changes in detrusor pressure may define BOO making it very difficult to develop reliable diagnostic nomograms. Additionally, many women cannot void in PFS due to obstructive effect of the catheter and unnatural environment. Relevant nomograms will be discussed during the workshop.

**Neurological evaluation:**
It starts with the focused neurological examination by the urologist. Neurology consultation is needed in persistent cases without an anatomic obstruction. MRI of the central and peripheral nervous system is the most commonly utilized radiological method to reveal certain neurological diseases such as MS, tumours, vertebral congenital and acquired pathologies. Concentric needle EMG of the external urethral sphincter is the test that diagnoses Fowler’s syndrome described in 1985. The EMG abnormality was called “decelerating bursts and complex repetitive discharges” where the exact pathophysiology remains unknown.

It has been suggested to be a muscle membrane disorder associated with a primary disorder of sphincter relaxation leading to increased urethral afferent activity that inhibits the passage of bladder afferent signals to the brain that results in poor sensation, large bladder capacity and DUA. The trigger may be hormonal disturbance (progesterone deficiency in PCO), opiates, childbirth and other factors (3). Concentric needle EMG of the external urethral sphincter should be spared to unexplained persistent cases.

**Speaker 4: Cristina Naranjo-Ortiz, Physiotherapist, (Spain)**

**Conservative Management**

Urinary retention is a complaint of the inability to pass urine despite persistent effort. Acute urinary retention is defined by the International Continence Society as a painful, palpable, or percussable bladder, with the patient unable to pass any urine when the bladder is full. Chronic retention of urine is defined as a non-painful bladder, where there is a chronic high PVR. Patients with covert bladder retention may present with frequency, passing less than 150ml with feeling of incomplete emptying. The incidence of acute urinary retention in women of all ages is in general uncommon. However, incomplete emptying with elevated post-void residual (PVR) is a frequent finding in geriatric women (up to one third), and the incidence is increased in frailer patients.

Whereas acute urinary retention is problematic, elevated post-void residual may be asymptomatic or associated with debilitating problems such as recurrent infection or urinary incontinence. Furthermore, urinary retention can be caused by a variety of disease processes, which in general are associated with either anatomic outlet obstruction or bladder dysfunction. The most common aetiologies for retention depend largely on the population studied. Whereas in younger patients, disorders causing failure of sphincter relaxation may play a primary role in the majority of cases, in older women retention is more likely to be linked to conditions associated with aging.

Regarding surgery, the incidence of urinary retention depends on the type of procedure. We should divide the management of these patients regarding the condition of the retention, if it is acute or chronic. Acute (complete) urinary retention is ten times less common in women than in men. In these cases, diagnosis is straightforward as patients will usually described either painful or painless inability to void for a prolonged period. Onset of symptoms may be gradual and can go unnoticed by caregivers of patients or by patients with limited bladder sensation or who are severely cognitively impaired and cannot report symptoms. In general, the presence of a weak stream may predict for elevated post-void residual, however, other voiding lower urinary tract symptoms (LUTS) are unreliable predictor.

In a first visit we can make a patient’s medical history in depth and examination of PFM. We must know all the pathologies that we are going to keep using the tools we have in our hands because they are contraindicated. Also in these sessions, we make a correct assessment of neurological L2 to S2 segments and musculature of the pelvic floor, so we have something to compare later. The first stage of treatment will be very simple and we can teach our patient to do the job of education ADL and teach the exercises. These should be very simple and always avoiding muscle fatigue to prevent worsening (albeit temporary) because we do not want the patient to demoralize and abandon the treatment. It could take be at least three months to return to normal bladder function. Other aids to these patients go through lifestyle changes and clean intermittent catheterization.

**Speaker 5: Christopher Chapple. Urologist (United Kingdom)**

**Medical and surgical treatment**

**Introduction:**
Urinary retention in women can either result from failure of normal detrusor contractile function, or as consequence of failure of coordinated relaxation of the bladder outlet during voiding.

**Initial Management:**
The initial goal of evaluation is to ensure bladder emptying until evaluation is complete and an appropriate diagnosis has been made to allow a decision to be made over the appropriate management strategy. An indwelling catheter can be used, failing which intermittent self-catheterization should be instituted.

**Medical options:**
There is no effective medical therapy for the underactive bladder.

### Pharmacological agents to facilitate bladder emptying

**No effective pharmacotherapy for UAB exists**

- Increasing intravesical pressure/bladder contractility
  - Parasympathetic agents (bethanechol, dicyclomine)
  - Prostaglandins
  - Beta-blockers
  - Opioid receptor antagonists

- Decreasing outlet resistance
  - Alpha-adrenergic receptor antagonists (phenoxybenzamine, prazosin, terazosin / doxazosin, alfuzosin / tamsulosin, cilostazol)
  - Beta-blockers
  - Baslefen
  - Dantrolene
  - Botulinum toxin
  - [Anti-androgens for reducing prostatic size, e.g., flutamide]

Studies do not support the use of parasympathomimetics. Specifically, when frequent and/or serious possible side effects are taken into account, combination therapy with a cholinergic drug and an alpha-blocker appears to be more useful than monotherapy.

Likewise, no oral therapy has been reported as being useful for patients with patients with failure of relaxation of the bladder outlet in case of either neurogenic detrusor sphincter dyssynergia (DSD) or Fowlers’ syndrome.

**Surgical Intervention:**
Surgical intervention in patients with detrusor underactivity has a limited role. Permanent catheterisation either urethral or preferably suprapubic has inevitable complications such as discomfort, infection and stone formation and is best avoided. If possible intermittent self-catheterization is the mainstay of therapy in many patients. A number of other therapies have been evaluated in highly selected patients.

### Interventions for DUA/UAB

- **Bladder Related (Increasing intravesical pressure or facilitating bladder contractility)**
  - External compression, Vibesive
  - Promotion / initiating reflex contraction
  - Electrical stimulation
  - Reduction cystoplasty
  - Bladder myectomy
  - Tissue engineering

- **Outlet Related (Decreasing outlet resistance)**
  - At site of anatomic obstruction
  - At level of smooth sphincter
  - At level of striated sphincter

- **Circumventing the Problem**
  - Intermittent catheterisation
  - Continuous catheterisation
  - Urinary diversion (condue)
  - Transurethral resection or Incision
  - T-T valve
  - Urethral ovestation
  - Surgical sphincterotomy
  - Urethral stent
  - Pubectomy nerve interruption

Similar comments relating to catheterization apply to the management of DSD but urethral catheterization particularly intermittent self-catheterization is poorly tolerated in Fowler’s syndrome. Injection of botulinum toxin into the urethral sphincter has not been adequately validated for DSD; although there is an evidence base to support its use in patients with Fowler’s syndrome. Failing all other option either continent or incontinent urinary diversion may be necessary.
Urinary Retention in Women

Concepts & Pathophysiology: The Urologist Point of View
David Castro-Diaz

Voiding dysfunction after delivery and pelvic surgery
Montserrat Espun˜a-Pons

Conservative management
Cristina Naranjo-Ortiz

Medical and Surgical Treatment
Christopher R Chapple

Discussion
All

Take Home Messages
David Castro-Diaz

Female Urinary Retention and Bladder Emptying Disorders

- Complete retention
- Incomplete or insufficient emptying
- Elevated post-void residual (PVR)
- Post-surgical - Incontinence surgery
  - Pelvic surgery
  - Other
- Symptomatic or asymptomatic
- Acute or chronic
- Related to the bladder or bladder outlet

Bladder dysfunction

-Detrusor underactivity
  Neurpathic
  - Lower motor neurons
  - Decentralizations
  Myogenic
  - Chronic obstruction or overdistention
  - Diabetes mellitus
  Pharmacologic
  - Anticholinergics
  - α-agonists
  - Narcotics
  Aging
  - Acontractile bladder
  - Failure of sphincter relaxation
  - Fowler’s syndrome
  - Learned
  - Pain

Urinary retention

- Men
  - BOO is common, diagnostic criteria are agreed, epidemiology of acute retention is known
- Women
  - BOO is rare and diverse, diagnostic criteria not agreed, epidemiology not well known
  - Varied voiding dynamics
  - Treatment outcome uncertain

The reported male to female ratio on urinary retention is 13:1, and the incidence is approximately 7 per 100,000 population per year
### Incomplete bladder emptying

Disease Progression

Unable to produce an effective voiding contraction.

Incomplete emptying and/or within a usual time span

- Chronic Urine retention
- Urinary Tract Infection - Bladder stones
- Renal Impairment

### Bladder outlet dysfunction

- Anatomic
  - Iatrogenic
    - Stricture
    - Anti-incontinence surgery
    - Pelvic organ prolapse
    - Extrinsic compression
    - Gynaecologic tumours
    - Meatal stenosis
    - Caruncle
    - Skene’s gland abscess
    - Urethral diverticulum
    - Urethral carcinoma
    - Ectopic ureteroceles
    - Retroverted impacted uterus (first trimester)
  - Functional
    - Primary bladder neck obstruction
    - Dysfunctional voiding
    - Detrusor external sphincter dyssynergia

### Postoperative voiding dysfunction (PVD)

- Precise definition of short/long-term problems not defined
- Short-term retention = 0 % to 27 %, long-term= 0 % to 3.8 %\(^1\)
- Tape too tight or bad contractility
- Cochrane Data base TVT 5.9% TOT 2.8%\(^2\)
- Diagnosed by hypersuspension
- Swann sign at MCU; curve at bladder neck
- Prolonged voiding with low Qmax<15 cm H2O & Pdet (>25 cm H2O) & PVR
- OAB complaints


### Urethral stricture in women

3-8 % of women who present to urologist with voiding complaints have BOO (Carr 1996)

Incidence in women with BOO varies from 4% to 13% (Nitti 1999, Groutz 2000, Kuo 2005)

Female urethral stricture is typically iatrogenic

- Prolonged catheterization
- Pelvic radiation
- Childbirth
- Surgery for diverticulum, fistula or incontinence
- Urethral dilatation (per-urethral fibrosis)

Small series & case reports
- Tuberculosis, vulvar dystrophy, lichen sclerosis, primary carcinoma, fibro-epithelial polyps, urethral leiomyoma, bladder drained pancreatic transplants, post TURBT
- Resection sacrum /coxys & after female-to-male transsexual reconstruction

### Primary Bladder Neck Obstruction

- First described by Marion in 1933
- Turner-Warwick advocated Urodynamics and VCU
- Diokno described the entity in 1984
- Precise cause remains obscure
- Failure of dissolution of mesenchymal tissue at BN
- Inclusion of abnormal connective tissue
- Smooth muscle hypertrophy & inflammatory changes (Leadbetter 1959)
- Neurologic aetiology (Awad 1976)

### Dysfunctional Voiding

- Intermittent and/or fluctuating flow rate due to involuntary intermittent contractions of the peri-urethral striated muscle during voiding, in neurologically normal individuals\(^1\)
- Broad range of symptoms and signs for several diagnoses affecting sexual function, bowel function, urinary continence, and voiding
- Levator muscles as a potential source impairing urinary flow rate\(^2\)
- Sphincter Vs levator muscles\(^\rightarrow\) prognostic implications\(^3\)
- Learned VD, Himman’s syndrome, non-neurogenic neurogenic bladder\(^4\)

Dysfunctional Voiding

- True Incidence not known 4.2% and 46.4%¹
- 2% of Urodynamic investigations²
- Sometimes with DOA, low compliance or V-U reflux³

Exact mechanism not fully understood
In children is considered a habitual disorder learning to contract pelvic floor or external sphincter during micturition (Sinha 2011)
- Toilet training process
- Response to urgency
- Associated to pelvic discomfort (constipation, abuse)
Occult neurogenic disorder
It is possible that some women with DV were once children with DV


Fowler’s syndrome

- Young women
  - post menarche
  - Polycystic ovary 40%
- High volume painless retention (1L)
- Apparently unconnected precipitating event
- All investigations normal, including MRI
- Not taking drugs, particularly opiate

WS 21
Urinary Retention in Women

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.00</td>
<td>Concepts &amp; Pathophysiology: The Urologist Point of View</td>
</tr>
<tr>
<td>14.40</td>
<td>Voiding Dysfunction after Delivery and Pelvic Surgery</td>
</tr>
<tr>
<td>15.00</td>
<td>Evaluation and Diagnosis</td>
</tr>
<tr>
<td>15.10</td>
<td>Conservative management</td>
</tr>
<tr>
<td>15.30</td>
<td>Medical and Surgical Treatment</td>
</tr>
<tr>
<td>15.40</td>
<td>Discussion</td>
</tr>
<tr>
<td>15.50</td>
<td>Take Home Messages</td>
</tr>
</tbody>
</table>
VOIDING DYSFUNCTION AFTER RADICAL PELVIC SURGERY AND AFTER DELIVERY

Montse Espuña-Pons, MD, PhD
Senior Consultant. Gynaecology. ICGON. Hospital Clinic. FCRB.
Associated Professor. University of Barcelona.
Barcelona. Spain

VOIDING DYSFUNCTION AFTER GYNAECOLOGICAL RADICAL PELVIC SURGERY

Impact of the radical surgery for cervical cancer on bladder function

Extensive lymphadenectomy and paracervical resection are considered the main causes of postoperative Lower Urinary Tract (LUT) dysfunction.

Women after Radical Hysterectomy (RH) had significantly more:
- voiding dysfunction
- urinary incontinence

Impact of the radical surgery for cervical cancer on bladder and urethral function.

- The published prevalence of some degree of bladder dysfunction ranges from 8 to 80%.
- Most physicians are not able to provide accurate counseling and follow-up as far as pelvic floor function is concerned.
A cohort of 333 women operated for cervical cancer, stage 1B and 2A, with radical hysterectomy from 1983 to 2000.

Symptoms of Difficult Voiding after Surgery
- Follow-up 5 years after the operation
- 123 / 333 (36%)

Early postoperative voiding dysfunction
- Observation of 67 consecutive cases of cervical cancer undergoing RH during 11 years at our institution.
- VD in only 4% > 30 days

The two cohorts, CCS and reference group, both comprised 242 women each.

1. 146 CCS had been treated with radical hysterectomy and pelvic lymph node dissection (RH and LND).
2. 49 underwent surgery and adjuvant radiotherapy (SART).
3. 47 underwent primary radiotherapy (PRT).

Prevalence of LUTS
- Median interval between cervical cancer treatment and completing the set of questionnaires was 6 years (range, 1 to 11 years) for all treatment groups.
- Patients treated < 12 months prior to the study were excluded.

Prevalence and distress from bladder and bowel symptoms with validated pelvic-floor-related questionnaires:
- Urogenital Distress Inventory (UDI)
- Defecatory Distress Inventory (DDI)
DIFFICULTY EMPTYING BLADDER 30-45%

- All patients treated had significantly higher risk than the reference group:
  1. RH and LND: OR 6.2 (2.0-5.3)
  2. RH and LND with adjuvant radiotherapy: OR 7.2 (2.4-21.2)
  3. Primary radiotherapy: OR 4.7 (1.4-15.6).

LUTS: PREVALENCE IN CCS COMPARED WITH MATCHED REFERENCES

INCOMPLETE EMPTYING (45-51%)

All patients treated had significantly higher risk than the reference group:

1. RH and LND: OR 3.2 (2.0-5.3)
2. RH and LND with adjuvant radiotherapy: OR 2.5 (1.1-5.9)
3. Primary radiotherapy: OR 4.3 (1.6-11.1).

Impact of the radical surgery for cervical cancer on bladder function

- Bladder dysfunction after radical hysterectomy is caused by partial disruption of the autonomic nerve fibres that pierce the paracervix and innervate the bladder.

Decreased detrusor muscle contraction is common urodynamic observation after radical hysterectomy

Most patients use abdominal straining or double voiding for emptying the bladder.

Nerve sparing RH (with conservation of the hypogastric nerve), showed only a mild functional impairment (reduced detrusor activity) in the early postoperative period.
CONCLUSIONS:

• Assessment in the pre and posttreatment is important for detecting distressing symptoms.

• Pre- and post-operatively, patients must get information about how reducing risks of LUTS (emptying the bladder appropriately, and exercising the pelvic floor muscles).

CONCLUSIONS:

• LUTS and urodynamic dysfunctions are common after radical surgery for cervical cancer.

• Promising results, in regard of the preservation of bladder function, after nerve-sparing radical hysterectomy and survival is not compromised by the procedure.

Impact of the radical surgery for cervical cancer on bladder function

VOIDING DYSFUNCTION AFTER DELIVERY

Two clinical situations may be observed:

A- Women who are unable to void spontaneously after a few hours of giving birth.(overt)

B- Women with abnormal postvoid residual volume (PVRV) detected by ultrasonography or by catheterization after first spontaneous micturition*, with a spontaneous recovery after several days.

Postpartum urinary retention (PUR)

• Women empty their bladders by relaxing the pelvic floor without a strong detrusor contraction.

The pathophysiology of PUR is not well documented, but some suggestions may explain part of the problem:

• VAGINAL DELIVERY is an anatomically and functionally traumatic event.

• Has impact on the anatomy of the pelvic organs, pelvic floor muscles and all pelvic structures.
Postpartum urinary retention (PUR)

Delivery not only influences the anatomy of the pelvic organs and pelvic floor muscles, but also may affect the nerve conduction. Through the development of pudendal nerve stretch, nerve pudendal conduction is affected, and pudendal nerve conduction affects lower urinary tract function. Postpartum urinary retention (PUR) is a common phenomenon in the peripartum period, with a prevalence varying between 0.5% and 40% (1-6). The mechanism of the stretch is often associated with birth trauma and the increase in the stretch of the different branches of the pudendal nerve, affecting the function of the different branches of the pudendal nerve. Epidural analgesia directly affects bladder sensitivity and contractility.
Delivery-related risk factors for covert postpartum urinary retention after vaginal delivery

A cross-sectional study to identify independent delivery-related risk factors for covert PUR after vaginal delivery.

Table 1: Baseline characteristics of the 107 included women

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal age (years)</td>
<td>Mean ± SD</td>
</tr>
<tr>
<td>Birth weight (kg)</td>
<td>Mean ± SD</td>
</tr>
<tr>
<td>Episiotomy</td>
<td>Yes, %</td>
</tr>
<tr>
<td>Opioid analgesia</td>
<td>Yes, %</td>
</tr>
<tr>
<td>Epidural analgesia</td>
<td>Yes, %</td>
</tr>
</tbody>
</table>

For the PVRV cut-off value of ≥250 mL, opioid analgesia, birth weight, epidural analgesia and episiotomy were risk factors.

For the PVRV cut-off value of ≥500 mL, opioid analgesia, epidural analgesia and episiotomy were significant risk factors.

Postpartum urinary retention (PUR)

Treatment

- Clinical guidelines on postpartum bladder management are lacking.
- Clean intermittent catheterization (CIC) and transurethral indwelling catheterization (TIC) are both standard treatments.

Table 2: Multivariable regression analysis including factors with p<0.20 in the univariable analysis (Table 1; maternal age, BMI and augmentation not included)

<table>
<thead>
<tr>
<th>Clinical factor</th>
<th>PVRV (500 mL)</th>
<th>PVRV (250 mL)</th>
<th>PVRV (150 mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opioid analgesia</td>
<td>Yes, 91.8%</td>
<td>78.9%</td>
<td>68.7%</td>
</tr>
<tr>
<td>Epidural analgesia</td>
<td>Yes, 39.0%</td>
<td>16.7%</td>
<td>9.2%</td>
</tr>
<tr>
<td>Episiotomy</td>
<td>Yes, 69.2%</td>
<td>40.0%</td>
<td>22.7%</td>
</tr>
</tbody>
</table>

In this study, symptoms and patient preference regarding catheterization method were similar for both regimens 3 months after delivery.

Postpartum urinary retention (PUR)

- If retention persist, multichannel urodynamics can be performed.
- Multichannel urodynamics will confirm in most patients an hypocontractile detrusor and in a few cases associated with stress urinary incontinence.

Multichannel urodynamics will confirm in most patients an hypocontractile detrusor and in a few cases associated with stress urinary incontinence.
Acute postpartum urinary retention (APUR)
can be a serious complication after childbirth?

Postpartum urinary retention (PUR)

CONCLUSIONS
• Routine measurement of the PVRV is not established.
• Increased vigilance is required in the primigravid patient with an epidural.
• Early detection of voiding dysfunction prevents bladder atony
• In most cases PUR resolves early, but PUR can persist

Postpartum urinary retention (PUR)

CONCLUSIONS
• It’s important to increase the awareness amongst postnatal staff.
• CISC is well tolerated by most patients.
• Patients, who complain of subjective voiding difficulties at follow-up after PUR need an early referral to the specialized units

Conclusions
Covert PUR according to the definition of PVRV ≥ 150 mL, is a common and transient phenomenon that does not result in more lower urinary tract symptoms 1 year after delivery. Although the current definition is not useful in identifying postpartum women with a pathological condition, we suggest that the definition of covert PUR should be change to: “PVRV ≤ 500 mL after the first spontaneous void after (vaginal) delivery.” This cut-off value is the value at which some women do need more time to normalise emptying of the bladder. The exact clinical implications of covert PUR need to be further studied in this subcategory of women.
Female Urinary Retention (FUR):
Evaluation and Diagnosis

Tufan Tarcan, MD, PhD
Professor of Urology
Marmara University School of Medicine
Istanbul, Turkey

W21, ICS, September 12, 2017, Florence

There is no strong consensus on the evaluation of FUR since the pathophysiology is poorly understood

- On average women with FUR are seen by three hospital consultants before a diagnosis is made
  - Kavia, RBC et al, BJU INT, 2006
- Etiology may be multifactorial but mainly divided in 3 groups:
  - Transient causes or
  - Detrusor underactivity or
  - Increased outlet resistance
- However it may also be:
  - Mixed
  - Unexplained (idiopathic)

Goals of evaluation (1)

- To ensure bladder emptying until evaluation is completed and management of retention is succeeded
- Foley catheterization is usually the choice for acute retention
- CIC should be preferred for periods longer than one week
- Long-term indwelling catheterization is advised only for frail pts when CIC cannot be performed

Goals of evaluation (2)

- To assess the upper urinary tract (UUT) and take the necessary measures to prevent any further damage during evaluation process
- Bladder emptying with CIC is the mainstay of UUT protection
- Ultrasound: Basic imaging modality to assess the UUT
- Renal function tests are needed in long term retention

Goals of evaluation (3)

- To find out the etiology in order to treat FUR
  - Transient causes
  - Persistent FUR
    - Will need more invasive neuro-urological evaluation such as UDS, cystoscopy and sphincter EMG
  - Evaluation goes together with treatment since treatment also starts with CIC
  - Enables to monitor PVR
  - FUR will resolve in a group of patients just with CIC after transient factors are eliminated
Transients causes of FUR

- Invasive tools such as invasive UDS or cystoscopy should be delayed if transient causes are present
  - Immobility (especially postoperative)
  - Constipation or fecal impaction
  - Medications
  - Urinary tract infections
  - Delirium
  - Endocrine abnormalities
  - Psychological problems
  - Clot retention
  - Post partum urinary retention

In fact, half of the women presenting with retention will void normally after transient factors are eliminated

Conclusions: The number of female retentions encountered in our practice is fairly high, with very few of these fitting the criteria for sacral nerve stimulation. In a third no etiology was found. Approximately half of those who successfully voided did so with no treatment.

Basic steps of evaluation (1)

- Detailed history
  - Presenting symptoms
    - Abdominal discomfort,
    - Emptying phase symptoms,
    - Recurrent urinary tract infections,
    - Incontinence
  - Onset: acute or chronic
    - In chronic cases, some pts may not be aware of retention
    - High level of anxiety is seen in acute cases

Basic steps of evaluation (2)

- Detailed history
  - Childhood voiding history
  - Previous surgery
  - Anti-incontinence or other pelvic surgeries
  - Co-morbidities
    - Hormonal status, DM
  - Medications that cause retention
    - SSRI, alpha agonists, anticholinergics, calcium channel blockers, opioid analgesics, psychotropic drugs
  - Constipation
  - Gynecological history
    - PCO, endometriosis
### Basic steps of evaluation (3)

- Physical examination
- Abdominal and sacral examination
- Pelvic examination
  - Urethra, prolapse
  - Focused neurological examination
- In prolonged cases:
  - Renal function tests and urine analysis
  - Cystoscopy
  - Invasive urodynamics and sphincter EMG
  - Advanced neurological tests

### Urodynamic studies

- Uroflowmetry and PVR measurement
  - In pts who are not in complete retention
- Cystometry and PFS with anal sphincter EMG
  - Detrusor underactivity is the most common finding
  - PFS are not always helpful
- Urethral Pressure Profile
  - Fowler’s syndrome is associated with high urethral closing pressure in UPP and sphincter volume on US
- Video-urodynamics: should be preferred when available
- “Since no test can accurately differentiate neurologic from non-neurologic female urinary retention, careful neuro-urologic evaluation will help guide to more appropriate management.” (ICI 2013)

### Definition of Detrusor UA

- “a contraction of reduced strength and/or duration, resulting in prolonged bladder emptying within a normal time span,
  - ICS (2002)
  - what constitutes reduced strength, reduced length of contraction, or prolonged emptying?
- ICI proposes to adhere to the original ICS definition but to further specify DUA by adding the condition in which it occurs
  - (e.g., DUA with bladder outlet obstruction or DU with neurogenic bladder dysfunction)

### Definition of acontractile detrusor

- The ICS defines an “acontractile detrusor” as one where no detrusor contraction is generated.
- Inability to void during a PFS should be differentiated on the basis of the clinical history.

### Problems with PFS

- Women empty their bladders by relaxing the pelvic floor,
  - sometimes with the additional help from the abdominal muscles
  - without a strong detrusor contraction compared to men.
- Small changes in Pdet may define BOO
  - Difficult to develop reliable diagnostic nomograms
- Many women cannot void in PFS
  - Obstructive effect of the cath.
  - Unnatural environment

### Neurological evaluation

- Starts with the focused neurological examination by the urologist
- Neurology consultation is needed in persistent cases without an anatomic obstruction
- MRI of the central and peripheral nervous system is the most commonly utilized radiological method to reveal certain neurological diseases
  - MS, tumors, vertebral congenital and acquired pathologies
Concentric needle EMG of the external urethral sphincter

- The test that diagnoses Fowler’s syndrome (1985)
- The EMG abnormality was called “decelerating bursts and complex repetitive discharges”
- A muscle membrane disorder,
- Primary disorder of sphincter relaxation
- Increased urethral afferent activity that inhibits the passage of bladder afferent signals to the brain
  - Poor sensation, large bladder capacity and DUA

Psychogenic urinary retention

- The characteristics of urodynamics in PUD are increased bladder sensation during bladder filling and underactive/acontractile detrusor during voiding.
  - None had DO or DSD
- Regarding neuropsychiatric aspects, PUD is usually accompanied by more obvious psychogenic/psychiatric features.
- The majority of patients had conversion disorder or anxiety disorder.

Psychogenic urinary retention

- Many patients are mistakenly labeled with psychological retention
- However, acute FUR may manifest a conversion symptom
  - Regarded as a psychosomatic disorder of the bladder due to neurosis/psychosis
  - Described more frequently in young adult females with history of childhood enuresis and disturbed social backgrounds.

An algorithm for the evaluation of FUR

- Initial evaluation:
  - Detailed history, physical examination, uroflowmetry, and urodynamic and PVR measurement, urine analysis and culture, urinary tract ultrasound, renal function tests
  - Neurology, gynecology, and psychiatry consultations, if necessary at any point

Transient FUR
- Treat the transient causes
- Consider referring care to the fist

Persistent FUR
- Consider surgical care to fist
- Urinary tract ultrasound
- Neurological consultation
- Psychological intervention

Further evaluation for Fowler’s Syndrome or psychogenic urinary retention
- A good quality (video) urodynamic study and cystoscopy
- Obvious anatomic causes
- Consider surgical correction
- Neurogenic bladder/sphincter dysfunction
- Manage the NBD
- Idiopathic retention
- Further evaluation for Fowler’s Syndrome or psychogenic urinary retention
Thank you
Urinary retention in women
Conservative management
C. Naranjo-Ortiz, PT, PhD

Affiliations to disclose*: ICS TRUSTEE

* All financial ties (over the last year) that you may have with any business organization:

Funding for speaker to attend:

☐ Self-funded
X Institution (non-industry) funded
☐ Sponsored by:

Urinary Retention (UR) in women
Prevalence and etiology

UR
• Acute ➔ Postsurgical or anaesthesia
• Chronic ➔ Neurologic, anatomic, inflammatory, functional and idiopathic

PREVALENCE
• Unknown in general (both types)
• Urodynamic reported ➔ 12% - 17%

Wennber, Al et al., 2009

Why UR occurs?

Urethra fails to relax
Additional infravesical resistance is present
Detrusor unable to contract

Failure in the synchronization of detrusor contraction and urethral relaxation

Why UR occurs?
Soumendra, N et al, 2007

Acute UR in women

Painful or painless ➔ Depends on neurological status
Sudden onset
Requires catheterization

Rena, D et al., 2014
Chronic UR in women

**Clinical evaluation of the Pelvic Floor Muscles (PFM)**
- Palpation
- PFM strength
- PFM coordination
- Ultrasound (US) imaging
- Perineal US
- Static
- Dynamic
- Superficial electromyography PFM
- With or without flowmetry
- Electrophysiology

**Clinical evaluation of the Pelvic Floor Muscles (PFM)**

**Chronic UR in women**

**Conservative management**

Recommended about three months of conservative management

In order to return to normal bladder function

**Physiotherapy**
- PFMT ➔ Relaxation techniques
- Bio feed-back
- Electrostimulation

**Other aids**
- Behavioural treatment: Life-style changes
- Clean intermittent self-catheterization

**PFMT**

Increases strength and durability of contraction of PFM

Increases urethral closure and stabilization

**PFMT – Relaxation techniques**

PFM work synergistically with deep abdominal muscles, multifidi muscles and respiratory diaphragm

Coactivation between PFM and transverse abdominis (TA)

Adherence is very important

Chapple, CR et al., 2008

Clinical evaluation of the Pelvic Floor Muscles (PFM)

Chapple, CR et al., 2008

Hsieh, J. et al., 2014

Imamura, Abrams, Bain et al., 2010

Chapple, CR et al., 2008

Clinical evaluation of the Pelvic Floor Muscles (PFM)
Feedback is essential in motor learning.

Biofeedback techniques: verbal, visual, manometric, EMG, US, etc.

Biofeedback can be used for autonomic functions.

Biofeedback can be used for autonomic functions.

Electrical Stimulation

Stimulate afferent fibers to convey bladder filling sensation

Stimulate efferent fibers to induce bladder contraction

Relax PFM involuntarily

Re-educate and condition PFM

Behavioural treatment: Life-style changes

Active use of PFM is a key voiding skill

Altering voiding habits, fluid intake and other aspects of life-style

Behavioural treatment are usually comprised of several components and tailored to the needs of the individual woman

Behavioural treatment are usually comprised of several components and tailored to the needs of the individual woman

ADAHERENCE

Continued adherence is key to maintaining PFMT effectiveness

Poor adherence results in a longer term decline in effect

Dumoulin, C et al., 2015

TAKE HOME MESSAGES

PFMT adherence should be monitored for attendance, home-exercises adherence and proper clinical intervention, and follow-up.

Patient-focused strategies targeting different PFMT strategies:
- influencing the intention to adhere,
- selfefficacy,
- positive attitude towards exercises,
- perceived benefits,
- integration of PFMT into daily activities.

General exercise-adherence theories should be used as a clinical guide in selecting appropriate patient-focused adherence strategies for PFMT protocol.

GRAZIE MILLE
CI VEDIAMO PRESTO

Dra. Cristina Naranjo Ortiz
Faculty of Medicine
Complutense University (Madrid, Spain)
cnaranjoortiz@gmail.com
**Management of Female Urinary Retention - Medical and Surgical**

Christopher Chapple  
Sheffield Teaching Hospitals  
NHS Foundation Trust  
UK

Workshop 21  
- Urinary Retention in Women

**Causes of female Retention**

- **ANATOMICAL**
  - Gynae: POP, fibroids
  - Post surgical
  - Urethral stenosis/diverticulum
  - Ureterocelectasis
  - Foreign body

- **FUNCTIONAL**
  - Underactive Bladder
  - Bladder neck obstruction
  - Pseudodysynergia
  - Neurological
  - Fowler’s syndrome

**Pharmacotherapy**

- Drugs with anticholinergic effects
- Anti-muscarinics
- Anti-histamines
- Anti-psychotics
- Anti-Parkinson's medications
- Anti-spasmodics
- Tricyclic antidepressants
- Opioids

**Aetiological factors**

- **Neurogenic injury/disease**
  - Neurological
    - Fowler's syndrome
  - Functional
  - Dysfunctional voiding
  - Idiopathic
  - Normal Ageing
  - Unknown factor in younger people

- **Vascular**
  - Stroke (early phase)

- **Degenerative**
  - Parkinson's Disease
  - Multi-system atrophy (MSA)
  - Demyelinating neuropathies
    - Multiple sclerosis
    - Guillain-Barre syndrome
    - Neurosyphilis (tabes dorsalis)
  - Peripheral neuropathies
    - Diabetic neuropathy
    - Herpes zoster/Herpes simplex
    - Diabetes mellitus
    - AIDS

- **Neurogenic injury/disease**
  - Spinal cord and cauda equina
    - Intra-vertebral disc prolapse
    - Cauda equina lesions
    - Spinal cord tumours
    - Spinal canal stenosis
    - Spinal cord injury
    - Sacral fracture
    - Pelvic fracture

- **Myogenic**
  - Bladder outlet obstruction
  - Diabetes

- **Iatrogenic**
  - Radical Pelvic surgery
  - Radical prostatectomy
  - Radical hysterectomy
  - Anterior resection, abdomino-perineal resection
  - Detrusor myomectomy
  - Intravesical Phenol injections
  - Radiation therapy

**Central circuits**

- Anterolateral white column
- Posterior column
- PMC
- PAG
- Limbus
- Hypothalamus
- Prefrontal cortex

**Main etiological factors**

- **Neurogenic injury/disease**
  - Neurological disease or injury
  - Diabetes mellitus
  - Bladder outlet obstruction due to BPH
  - Normative Ageing

**Aetio-pathogenesis of Detrusor Underactivity**

- Neurological disease or injury
- Diabetes mellitus
- Bladder outlet obstruction due to BPH
- Normative Ageing

**Detrusor Myocyte Extracellular Matrix**

- Neurological disease or injury
- Diabetes mellitus
- Bladder outlet obstruction due to BPH
- Normative Ageing

- Failed/insufficient neural input
- Impaired activation of detrusor
- Early tonus of detrusor
- Loss of intrinsic integrity

**DETRUSOR UNDERACTIVITY**
Method ab / 2π

1) Real time indication of

In patients with retention (n=31)
Post–Relaxation time of striated sphincter is shorter than the

Figure from: Gaunt Prog Brain Res 2006;152:163

contraction
Van Kerrebroek J Urol 2007;178:2029

1) Measure of bladder
- shortening
Opioid

α Blockers of inhibition
Used for idiopathic urinary retention
device

1) no widely accepted
contraction
toxin
[anti
mean volume per catheterisation
Prostaglandins
UTI, urethral trauma, urethritis, epididymo–
Combination therapy with a cholinergic drug and an alpha
Ventral root stimulation +/-
Indwelling ()

–
Limitations
mean number of catheterisations
Receptor antagonists
Voluntary stop test
Dantrolene
Pressure/bladder contractility
Most prevalent method of bladder management in patients with UAB
Straining?
Requires intact neural pathway and a bladder capable of

Detrusor

Available studies do not support the use of parasympathomimetics
However, many patients find the technique difficult
Baclofen
Parasympathetic agents (dorsal root section / sacral
Suprapubic

–

-

-

-

- 1 0 0

- 1 5 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0

- 1 0 0
Intravesical Electrical Stimulation (IVES)

- Establishes conscious control of the initiation and completion of a micturition reflex
- Activates specific mechanoreceptors in the bladder wall
- Lowers the micturition threshold and enhances reflex amplitude
- Randomised placebo-controlled trial lacking

- Achieved long-term normalisation of voiding in 20/24 (83%) children with idiopathic, and 8/20 (40%) with neurogenic, underactive detrusor

  - 10 daily 60 min session (5 x 20 min sessions in 22 pts) followed by home treatment (2–3 times weekly) until bladder function normalised/no further improvement
  - In responsive children (n=14):
    - Median residual volume decreased (75 mL range 6–419 mL to 22 mL range 0–338 mL; p<0.0001)
    - Median voided volume increased (80 mL range 0–625 mL to 220 mL range 30–636 mL; p<0.0001)
  - Effects stable for 2 years
  - Catheterisation discontinued in 11/15 cases

Surgical options

- Trans urethral resection of prostate
- Intrasphincteric Botulinum Toxin
- Reduction cystoplasty
- Detrusor Myoplasty

Future directions

1. Underactive bladder
   - Prospective study correlating symptoms and signs with DUA
   - Development of patient-reported outcome measure

2. Detrusor underactivity
   - Consensus and validation of urodynamic diagnostic criteria
   - Development of non-invasive methods of new pharmacological therapy?

Causes of female Retention

ANATOMICAL
- Gynaec; POP, fibroids
- Post surgical
- Urethral stricture/diverticulum
- Ureterocoele
- Foreign body

FUNCTIONAL
- Underactive Bladder
- Bladder neck obstruction
- Pseudodysynergia
- Neurological
- Fowler’s syndrome

Conservative Treatment Options

- Watchful waiting
- Intermittent catheterization
- Indwelling catheter
- Pharmacotherapy to control associated overactivity
- Dilation (?) – I do not recommend

Definitive Treatment Options

Midurethral Synthetic Sling
- Sling incision
- Sling loosening (early)
- Urethrolysis

Traditional Slings
- Sling Incision (PV sling)
- Urethrolysis
  - Transvaginal
  - Retropubic
  - Suprametal (infrapubic)
- Cut suspension/sling sutures
  - No published peer-reviewed series
**Technique of Mid Urethral Sling Loosening 1-2 weeks**

- Infiltrate anterior vaginal wall with 1% lidocaine
- Open vaginal suture line
- The sling is identified and hooked with a right-angle clamp
- Spreading of the right angle clamp or downward traction on the tape will usually loosen it (1-2 cm)
- If the tape is fixed, it can be cut
- Reapproximate vaginal wall

Vic Nittis personal communication

---

**Midurethral Synthetic Sling Incision**

- If the sling is difficult to identify, can go lateral to the midline especially for TO slings
- It is critical to identify the sling with certainty (consider pathologic confirmation)

Illustrations from Vaginal Surgery for The Urologist
Nitti VW, Rosenblum NB, Brucker BM Elsevier, 2012

---

**Obstructing Midurethral Sling at 11 months**

---

**Obstructing Midurethral Sling Complete Retention at 3 months**

---

**TVT Take Down Results**

<table>
<thead>
<tr>
<th>N</th>
<th>Type</th>
<th>Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>Midline Incision</td>
<td>100% normal emptying</td>
</tr>
<tr>
<td>23</td>
<td>Midline Incision</td>
<td>Loosening 50% complete, 50% partial resolution of storage sx</td>
</tr>
</tbody>
</table>

* Recurrent SUI in 6%
** Significant recurrent SUI 13%
26% recurrent SUI, but significantly better than prior to TVT

---

**Outcomes of Midurethral Sling Revision for Voiding Dysfunction: Multicenter Retrospective Study**


- 175 patients (70% RP and 30% TO)
- 54% cut (mean 71 days)
- 29% excised (mean 102 days)
- 18% pulled down (mean 9 days)

**Outcomes**

- Voiding symptoms resolved in 81%
- Storage symptoms resolved in 75%
- De novo SUI in 21%
- De novo OAB in 12%

Resolution of VD independent of method and timing of revision
SUI less likely with early revision

---

### Traditional Sling Incision Results

<table>
<thead>
<tr>
<th>N</th>
<th>Type</th>
<th>Success</th>
<th>SUI</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>Midline Incision</td>
<td>84%</td>
<td>17%</td>
</tr>
<tr>
<td>32</td>
<td>Various</td>
<td>94% retention</td>
<td>9%</td>
</tr>
<tr>
<td>14</td>
<td>Midline Incision</td>
<td>93%</td>
<td>21%</td>
</tr>
</tbody>
</table>


### Formal Urethrolysis: Indications after Sling Surgery

- Failed sling incision (any material)
- Inability to identify autologous or biological sling
- In certain cases where there is consideration to another sling in the same setting

### Urethrolysis - Anatomy

- Urethra may be fixed to the pubic bone with dense scar tissue
- Goal of urethrolysis is to completely free & mobilize urethra

### Transvaginal Urethrolysis

- Inverted U incision
- Lateral dissection above periurethral fascia
- Endopelvic fascia sharply perforated and retropubic space entered

### Transvaginal Urethrolysis

- Sharp and blunt dissection freeing the urethra from the undersurface of the pubic bone
- Index finger placed between pubic bone and urethra

Place penrose drain around the urethra
Transvaginal Urethrolysis
Optional - Interposition of Martius Flap

- Mobilization of urethra by sharp dissection
- Restore complete mobility to anterior vaginal wall
- Paravaginal repair
- Interposition of omentum between urethra and pubic bone

Suprameatal Urethrolysis

- Curved incision above the urethra

Urethrolysis Results

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Type</th>
<th>Success</th>
<th>SUI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foster &amp; McGuire</td>
<td>48</td>
<td>Transvaginal</td>
<td>65%</td>
<td>0</td>
</tr>
<tr>
<td>Nitti &amp; Raz</td>
<td>42</td>
<td>Transvaginal</td>
<td>71%</td>
<td>0</td>
</tr>
<tr>
<td>Cross, et al</td>
<td>39</td>
<td>Transvaginal</td>
<td>72%</td>
<td>3%</td>
</tr>
<tr>
<td>Goldman, et al</td>
<td>32</td>
<td>Transvaginal</td>
<td>84%</td>
<td>19%</td>
</tr>
<tr>
<td>Petrou, et al</td>
<td>32</td>
<td>Suprameatal</td>
<td>67%</td>
<td>3%</td>
</tr>
<tr>
<td>Webster &amp; Kreider</td>
<td>15</td>
<td>Retropubic</td>
<td>93%</td>
<td>13%</td>
</tr>
<tr>
<td>Petrou &amp; Young</td>
<td>12</td>
<td>Retropubic</td>
<td>83%</td>
<td>18%</td>
</tr>
<tr>
<td>Carr &amp; Webster</td>
<td>54</td>
<td>Mixed</td>
<td>78%</td>
<td>14%</td>
</tr>
</tbody>
</table>

Retropubic Urethrolysis

- Mobilization of urethra by sharp dissection
- Paravaginal repair
- Interposition of omentum between urethra and pubic bone

Suprameatal Urethrolysis

- Sharp dissection of urethra and bladder neck off pubic bone
  - Pubourethral, pubovesical “ligaments” incised
  - Retropubic space entered
  - Lateral attachments left
  - Care to avoid injury to autonomic nerves
  - Martius flap

Urgency Incontinence
- 2/16 (12%) resolved
- 11/16 (69%) improved - required anticholinergics
- 3/16 (19%) no improvement

Stress Incontinence
- 4/22 (18%) de novo SUI
- 2 had persistent SUI
- 5 women had bulking and 4 were improved

Repeat Urethrolysis

Urgency Incontinence
- 2/16 (12%) resolved
- 11/16 (69%) improved - required anticholinergics
- 3/16 (19%) no improvement

Stress Incontinence
- 4/22 (18%) de novo SUI
- 2 had persistent SUI
- 5 women had bulking and 4 were improved
Obstructing Sling Algorithm

- Early Intervention (Mid urethral synthetic sling)
  - Yes
  - No
- Sling loosening or cutting - office
  - Failure
  - Watchful waiting
- Transvaginal Sling incision - OR
  - Failure
- Transvaginal Urethrolysis
  - Failure
- Repeat Urethrolysis (possible retropubic)

Summary

- Clinically significant obstruction after sling surgery incontinence surgery may not be “common” but occurs even in the most experienced hands
- Sling incision and urethrolysis, by a variety of techniques, are successful in restoring emptying and relieving LUTS in a majority of cases
  - Some studies “suggest early rather than late is better”
- The diagnosis is most often made based on clinical grounds rather than testing

Causes of female Retention

- **ANATOMICAL**
  - Gynae; POP, fibroids
  - Post surgical
  - Urethral stenosis/diverticulum
  - Ureterocoele
  - Foreign body
- **FUNCTIONAL**
  - Underactive Bladder
  - Bladder neck obstruction
  - Pseudodysynergia
  - Neurological
  - Fowler’s syndrome

Treatment of Fowler’s syndrome

- Stop all opioid analgesic drugs
- No established drug treatment
  - Alpha-1 antagonists and viagra poor outcome
  - PDE4 inhibitor theoretical potential
- Self catheterisation very poorly tolerated; Mitrofanoff procedure
- Sacral nerve stimulation

SNS in Fowler’s syndrome

- FDA/ NICE supported
- Some patients show marked improvement
- Physiological mechanisms unclear
- Cost
- Patient selection
EMG-negative Fowler's syndrome

- “Non-Fowler Fowler’s syndrome”
- Baclofen
- Supportive measures and follow up
- Mitrofanoff procedure

Causes of female Retention

- ANATOMICAL
  - Gynae; POP, fibroids
  - Post surgical
  - Urethral stenosis/diverticulum
  - Ureterocoele
  - Foreign body

- FUNCTIONAL
  - Underactive Bladder
  - Bladder neck obstruction
  - Pseudodyssynergia
  - Neurological
  - Fowler’s syndrome

U-Shaped

Circumferential
Pre-operative assessment
- How large is it?
- Is it asymptomatic?
  Only treat if symptomatic
- Physical examination
  - Cystocele
  - Stress incontinence
- Need for urodynamics
- Is there infection present?
  - MSU

Female urethral diverticula
Treatment
- Palliative
  - Endoscopic incision
- Curative
  - Marsupialisation
  - Excision
  - Excision & Young – Dees reconstruction

Excisional Surgery - tips
- Sim’s Position rather than standard lithotomy
- Self retaining retractor – eg Parkes
- Good light
- Suction
- Infiltrate with fluid (adrenaline)

Urodynamic films and subsequent MRI
  - note extension behind bladder
Technique

- ‘U’ Flap of vaginal mucosa
- Dissection of the diverticulum
- Closure in layers – careful repair of the urethra
- Martius flap
  - Overclosure of repair
  - Mitigate against stress incontinence
  - Facilitate subsequent sling procedure
Post-operative Management

- Remove vaginal pack & Martius donor site drain at 24 hours
- Suprapubic catheter
- Leave urethral catheter for 2-3 weeks
- Oral antibiotics until catheter removed

Results

69 patients underwent UD repair, the majority were mid urethral (46%) or distal (31%), often multilobulated. Median age was 40 years. Average size was 12mm (range 8-42mm). 26 patients had pre-existing SUI. 3 of these had fistulae after failed urethral surgery, 6 were recurrent UD, and 2 had received Tension-free Vaginal Tapes prior to referral.
Summary

- If symptomatic excise
- Prone position
- Martius Flap
- Subsequent autologous sling

Female strictures

- Rare
- Dilation
- Failing conservative management then urethrolasty
  - Vaginal flap
  - Oral mucosa

Surgical Options – Vaginal Flap

- Vaginal Flap urethroplasty first described in 1935
  - Harris Surg Gynec Obstet 1935 41:366
  - Modified Ellis and Hodges J Urol 1969 102:214
- Urethral catheterisation
  - “U” flap in anterior vaginal wall
  - Stricture incised
  - Flap advanced avoids tunneling

Surgical Approach to the Urethra

- No guidelines or recommendations on this at present.
  - Evidence would suggest either a dorsal or ventral approach.
  - Consider Martius if intend inserting a sling
  - Consider sling at first operation if severely incontinent otherwise I favour a two stage approach.
  - Long term follow-up is important

Conclusions

- Female outlet obstruction is a varied group
- Anatomical and functional causes
- Post surgical retention; examination findings can guide suitable intervention
- Urethral stenosis manage as conservatively as possible
- Urethral diverticulum – manage with due attention to sphincter
- Fowler’s syndrome;
  - young women with painless retention
  - High MUCP and typical EMG