

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

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 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

Risk factors for urinary retention after vaginal hysterectomy for pelvic organ prolapse.
 Obstet Gynecol Sci. 2016 Mar;59(2):137-43. doi: 10.5468/ogs.2016.59.2.137. Epub 2016 Mar 16.
 Chong C1, Kim HS1, Suh DH2, Jee BC3.

Underactive bladder in women: is there any evidence?

Curr Opin Urol. 2016 Feb 26. [Epub ahead of print]

Cohn JA1, Brown ET, Kaufman MR, Dmochowski RR, Reynolds WS.

Characteristics of urinary retention in female inpatients managed with medical treatments.

Korean J Urol. 2015 Dec;56(12):817-22. doi: 10.4111/kju.2015.56.12.817. Epub 2015 Nov 26.

Lee CY1, Kim CS1, Cho WJ1.

Factors Associated with Incomplete Bladder Emptying in Older Women with Overactive Bladder Symptoms.
J Am Geriatr Soc. 2015 Jul;63(7):1426-31. doi: 10.1111/jgs.13474. Epub 2015 Jul 1.
Park J1, Palmer MH2.

Urinary retention in elderly women: diagnosis & management.
Curr Urol Rep. 2014 Nov;15(11):454. doi: 10.1007/s11934-014-0454-x.
Malik RD1, Cohn JA, Bales GT.

Urinary retention and uterine leiomyomas: a case series and systematic review of the literature.
Int Urogynecol J. 2015 Sep;26(9):1277-84. doi: 10.1007/s00192-015-2665-1. Epub 2015 Mar 10.
Wu CQ1, Lefebvre G, Frecker H, Husslein H.

Urinary retention in women.
Curr Opin Urol. 2014 Jul;24(4):375-9. doi: 10.1097/MOU.000000000000071.
Juma S1.

Dysfunctional voiding.
Curr Opin Urol. 2014 Jul;24(4):330-5. doi: 10.1097/MOU.000000000000074.
Artibani W1, Cerruto MA.

Risk factors for incomplete bladder emptying after midurethral sling.
Urology. 2013 Nov;82(5):1038-41.
Norton PA, Nager CW, Chai TC, Mueller E, Stoddard A, Lowder J, Varner E, Lemack G; Urinary Incontinence Treatment Network.

Suggested Reading

1.-Urinary retention.

Hernández Hernández D, Tesouro RB, Castro-Diaz D.
Urologia. 2013 Sep-Dec;80(4):257-64. doi: 10.5301/RU.2013.11688. Review.

2.-Summary of European Association of Urology (EAU) Guidelines on Neuro-Urology.

Groen J, Pannek J, Castro Diaz D, Del Popolo G, Gross T, Hamid R, Karsenty G, Kessler TM, Schneider M, 't Hoen L, Blok B.
Eur Urol. 2016 Feb;69(2):324-33. doi: 10.1016/j.eururo.2015.07.0

3.-Lower Urinary Tract Symptoms and Aging: The Impact of Chronic Bladder Ischemia on Overactive Bladder Syndrome.

Camões J, Coelho A, Castro-Diaz D, Cruz F.
Urol Int. 2015;95(4):373-9. doi: 10.1159/000437336. Review.

4.-How can we measure bladder volumes in women with advanced pelvic organ prolapse?

Cassadó J, Espuña-Pons M, Díaz-Cuervo H, Rebollo P; GISPEM Group..
Ultrasound Obstet Gynecol. 2015 Aug;46(2):233-8. doi: 10.1002/uog.1467

5.-Bladder function after radical hysterectomy for cervical cancer.

Laterza RM, Sievert KD, de Ridder D, Vierhout ME, Haab F, Cardozo L, van Kerrebroeck P, Cruz F, Kelleher C, Chapple C, Espuña-Pons M, Koelbl H.

Neurourol Urodyn. 2015 Apr;34(4):309-15. doi: 10.1002/nau.22570. Review.
PMID: 24519734

6.-Evaluating the results of stress urinary incontinence surgery with objective and subjective outcome measures.

Diez-Itza I, Espuña-Pons M; Grupo de Investigación de Disfunciones de Suelo Pélvico en Mujer– GISPEM..
Eur J Obstet Gynecol Reprod Biol. 2014 Sep;180:68-71. doi:

7.-Safety and efficacy of retropubic or transobturator midurethral slings in a randomized cohort of Turkish women.

Tarcan T, Mangir N, Sahan A, Tanidir Y, Sulukaya M, ?lker Y.
Urol Int. 2014;93(4):449-53. doi: 10.1159/000364952.

PMID: 25170535

Similar articles

Select item 23757108

8.-Management of lower urinary tract dysfunction in multiple sclerosis: a systematic review and Turkish consensus report.

Çetinel B, Tarcan T, Demirkesen O, Özyurt C, ?en ?, Erdo?an S, Siva A.
Neurourol Urodyn. 2013 Nov;32(8):1047-57. doi: 10.1002/nau.22374. Review.

PMID: 23757108

Similar articles

Select item 24175037

9.-Management of complications after tension-free midurethral slings.

Cetinel B, Tarcan T.
Korean J Urol. 2013 Oct;54(10):651-9. doi: 10.4111/kju.2013.54.10.651. Review.

PMID: 24175037

10.-What is normal bladder neck anatomy?

Naranjo-Ortiz C, Shek KL, Martin AJ, Dietz HP.

Int Urogynecol J. 2016 Jun;27(6):945-50. doi: 10.1007/s00192-015-2916-1.

PMID: 26700104

Similar articles

Select item 23269334

11.-Urodynamic approach to female urinary incontinence refractory to treatment with anticholinergics.

Naranjo-Ortiz C, Clemente-Ramos LM, Salinas-Casado J, Méndez-Rubio S.

Arch Esp Urol. 2012 Dec;65(10):879-86. English, Spanish.

PMID: 23269334

12.-The Role of Urodynamics in the Evaluation of Urinary Incontinence: The European Association of Urology Recommendations in 2016.

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

Eur Urol. 2016 Oct 7. pii: S0302-2838(16)30685-6. doi: 10.1016/j.eururo.2016.09.045.

13.-Evaluating Alternative Materials for the Treatment of Stress Urinary Incontinence and Pelvic Organ Prolapse: A Comparison of the In Vivo Response to Meshes Implanted in Rabbits.

Roman S, Urbánková I, Callewaert G, Lesage F, Hillary C, Osman NI, Chapple CR, Deprest J, MacNeil S. J Urol. 2016 Jul;196(1):261-9. doi: 10.1016/j.juro.2016.02.067.

14.-Detrusor underactivity and the underactive bladder: Symptoms, function, cause-what do we mean? ICI-RS think tank 2014.

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

Neurourol Urodyn. 2016 Feb;35(2):312-7. doi: 10.1002/nau.22807. Review.

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 España-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 of 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-urologic 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 is 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 behavioural treatment, 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.

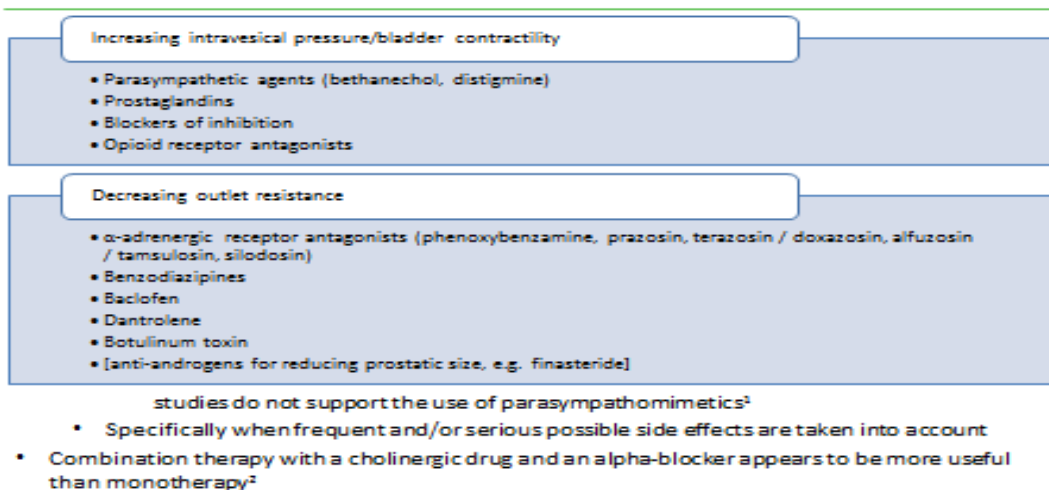
Initial Management:

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

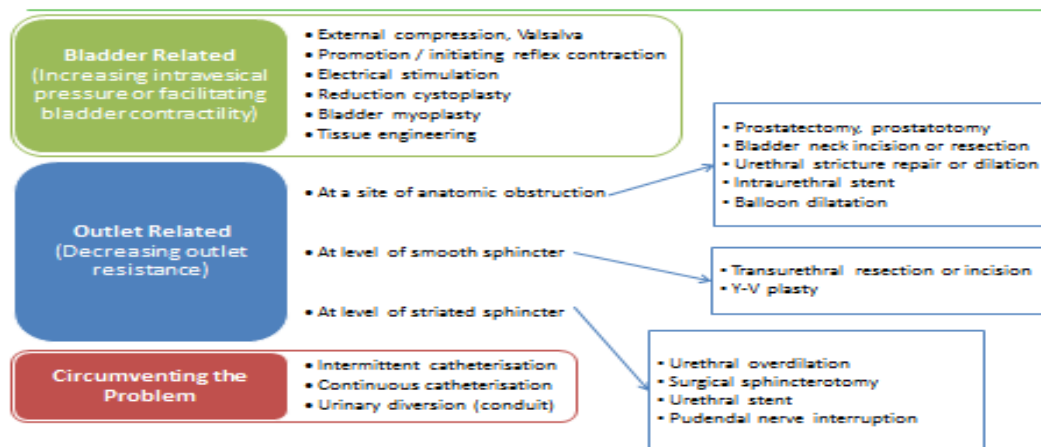


Likewise, no oral therapy has been reported as being useful for patients with failure of relaxation of the bladder outlet in case of either neurogenic detrusor sphincter dyssynergia (DSD) or Fowlers’ syndrome.

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



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.



WS 21 Urinary Retention in Women

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Urinary retention in women: concepts and pathophysiology D. Castro-Diaz

University of La Laguna / Hospital Universitario de Canarias
Spain

David Castro-Diaz

Affiliations to disclose:

Astellas/Investigator & Speaker
Boston Scientific/Consultant
Neomedic/Speaker/Trainer
Ipsen/Investigator
Allergan Investigator

Funding for speaker to attend:

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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

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

Neuropathic

- Lower motor neurons
- Decentralizations

Myogenic

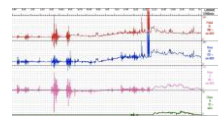
- Chronic obstruction or overdistention
- Diabetes mellitus
- Pharmacologic
 - Anticholinergics
 - α -agonists
 - Narcotics
- Aging

-Acontractile bladder

- Failure of sphincter relaxation
- Fowler's syndrome
- Learned
- Pain

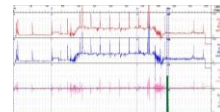
Underactive detrusor

A contraction of reduced strength and/or duration, resulting in prolonged bladder emptying and/or a failure to achieve complete bladder emptying within a normal time span

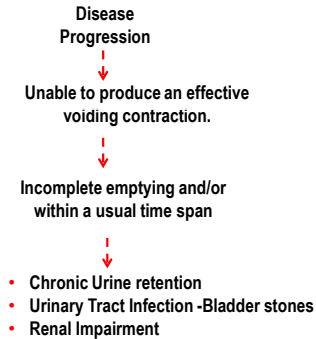


Acontractile detrusor

A detrusor that cannot be demonstrated to contract during urodynamic studies



Incomplete bladder emptying



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 ureterocele
- 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

1.-Petri 2005, 2.-Ogah 2009

Urethral stricture in women

3-8 % of women who present to urologist with voiding complaints have BOO (Carr1996)
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
- Pelvic fracture
- Surgery for diverticulum, fistula or incontinence
- Urethral dilatation (peri-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 VCUg
- 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 individuals¹
- 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 rate²
- Sphincter Vs levator muscles → prognostic implications³
- Learned VD, Himman's syndrome, non-neurogenic neurogenic bladder⁴

1.-Allen 1977 2.-Haylen 2009 ICS/IUGA 3.-Deindl 1998 4.-Himman 1986

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

1.-Sinha 2001, 2.-Groutz 2001, Jorgensen 1982

Abnormal electromyographic activity of the urethral sphincter, voiding dysfunction, and polycystic ovaries: A new syndrome?

Clare J Fowler, Timothy J Christmas, Christopher R Chapple, Helen Fitzmaurice Parkhouse, Roger S Kirby, Howard S Jacobs

BMJ VOLUME 297 3 DECEMBER 1988

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



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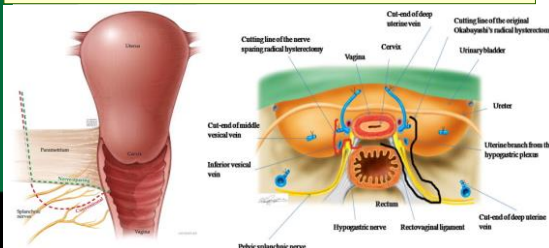
VOIDING DYSFUNCTION AFTER RADICAL PELVIC SURGERY AND AFTER DELIVERY

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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



Impact of the **radical surgery for cervical cancer** on bladder function

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.

VOIDING DYSFUNCTION

Impact of the **radical surgery for cervical cancer** on bladder 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.

Available online at www.sciencedirect.com
 ELSEVIER SCIENCE @ DIRECT® EJSO The Journal of Cervical Surgery
 EJSO 32 (2006) 445–449 www.ejso.com

Urogynaecological dysfunction after radical hysterectomy
 S.M. Axelsen^a, L.K. Petersen
 Department of Gynecology and Obstetrics, Skejby Hospital, Aarhus University Hospital, Brendstrupgaardsvej, DK-8200 Aarhus N, Denmark
 Accepted 26 January 2006
 Available online 3 March 2006

- A cohort of 333 women operated for cervical cancer, stage 1B and 2A, with radical hysterectomy from 1983 to 2000.
- Retrospective and lack of a control group.

Axelsen and Petersen / EJSO 32 (2006) 445–449 CLÍNICA Hospital Universitario

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Urogynaecological dysfunction after radical hysterectomy
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SYMPTOMS OF DIFFICULT VOIDING AFTER SURGERY

- Follow-up 5 years after the operation
- 123 /333 (36%)

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Early postoperative voiding dysfunction

ORIGINAL ARTICLE
 (Int J Gynecol Cancer 2010;20: 173–178)

Comparative Study of Laparoscopically Assisted Radical Vaginal Hysterectomy and Open Wertheim-Meigs in Patients With Early-Stage Cervical Cancer
 Eleven Years of Experience

Jasme Pahisa, PhD, Sergio Martínez-Román, PhD, Aureli Torró, PhD, Pere Fusté, MD, Inmaculada Alonso, PhD, Jose Antonio Lejárcaga, PhD, and Joan Balasch, PhD

Observational study of 67 consecutive cases of cervical cancer undergoing RH during 11 years at our institution.

- VD in only 4 % > 30 days

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Contents lists available at ScienceDirect
 Gynecologic Oncology
 journal homepage: www.elsevier.com/locate/gygyno

Long-term cervical cancer survivors suffer from pelvic floor symptoms:
 A cross-sectional matched cohort study

M.H. Hazewinkel^{a,*}, M.A.G. Sprangers^b, J. van der Velden^c, C.H. van der Vaart^c, L.J.A. Stalpers^d, M.P.M. Burger^e, J.P.W.R. Roovers^a

A cross-sectional matched cohort study.
Cervical Cancer Survivors (CCS), treated in the Academic Medical Center, Amsterdam between 1997 and 2007, were match to a random female population sample aged 20 to 70 years (reference group).

Prevalence and distress from bladder and bowel symptoms with validated pelvic-floor-related questionnaires.

- Uro-genital Distress Inventory (UDI)
- Defecatory Distress Inventory (DDI)

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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).

Hazewinkel et al. / Gynecologic Oncology 117 (2010) 281–286 CLÍNICA Hospital Universitario

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

	RH and LND (N=146)			SART (N=49)			PRT (N=47)		
	%	OR	(95%CI)	%	OR	(95% CI)	%	OR	(95% CI)
UDI items									
Urinary frequency	23	0.6	(0.3–0.9)	42	1.8	(0.8–4.2)	71	7.0	(2.8–17.5)
Urgency	19	0.2	(0.1–0.4)	40	0.7	(0.3–1.5)	78	3.5	(1.4–8.7)
Urge incontinence	45	3.0	(1.8–5.0)	58	4.3	(1.8–10.3)	57	3.7	(1.5–8.9)
Stress incontinence	60	1.5	(0.9–2.3)	76	3.5	(1.5–8.2)	53	1.0	(0.5–2.4)
Difficulty emptying bladder	45	6.2	(3.4–11.3)	45	7.2	(2.4–21.2)	30	4.7	(1.4–15.5)
Incomplete emptying	51	3.2	(2.0–5.3)	45	2.5	(1.1–5.8)	47	4.3	(1.6–11.5)
Dysuria	11	1.9	(0.8–4.4)	6	1.0	(0.2–5.2)	26	5.2	(1.4–19.8)

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LUTS: PREVALENCE IN CCS COMPARED WITH MATCHED REFERENCES

DIFFICULTY EMPTYING BLADDER 30- 45%

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

- RH and LND : **OR 6.2 (2.0-5.3)**
- RH and LND with adjuvant radiotherapy: **OR 7.2 (2.4-21.2)**
- Primary radiotherapy : **OR 4.7 (1.4-15.6).**

Hazewinkel et al. / Gynecologic Oncology 117 (2010) 281–286




LUTS: PREVALENCE IN CCS COMPARED WITH MATCHED REFERENCES

INCOMPLETE EMPTYING (45- 51%)

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

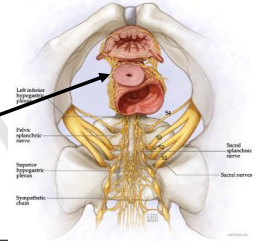
- RH and LND : **OR 3.2 (2.0-5.3)**
- RH and LND with adjuvant radiotherapy: **OR 2.5 (1.1-5.9)**
- Primary radiotherapy : **OR 4.3 (1.6-11.1).**

Hazewinkel et al. / Gynecologic Oncology 117 (2010) 281–286



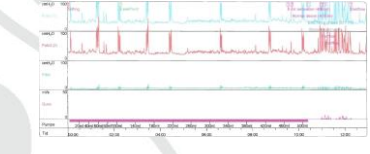
Impact of the radical surgery for cervical cancer on bladder function

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




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Decreased detrusor muscle contraction is common urodynamic observation after radical hysterectomy



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

Manchana et al. Int Urogynecol J (2010) 21:95–101



Nerve-sparing class III-IV radical hysterectomy: urodynamic study and surgical technique.

Author information

Abstract

OBJECTIVE: The aim of this study was to demonstrate the impact of the nerve-sparing radical hysterectomy on the bladder function.

METHODS: Patients with cervical cancer stage IB1 to IB2, who underwent type 3 to 4 nerve-sparing radical hysterectomy, were evaluated with urodynamic test before and within 6 months from surgery. Stage IB2 to IB3 patients were treated with platinum-based neoadjuvant chemotherapy. Bladder catheter was removed in postoperative day 10, only 3 (20%) patients continued intermittent self-catheterization. Before surgery, 1 (6.2%) patient had urodynamic symptoms of incontinence, and 3 (20%) had overactive bladder detrusor. Postoperative urodynamic study (median, 4 months, range, 3-6) showed reduced detrusor activity in 8 (53%), overactive detrusor in 4 (27%), and normal profile in 3 (20%) patients. Reduced bladder sensation was observed in 2 (12.5%), and residual urine more than 30% of bladder capacity in 2 (12.5%) patients, respectively. No patient showed de novo incontinence. Bladder compliance was unchanged.

CONCLUSIONS: The separation of the hypogastric nerve from the parametrium is a feasible surgical step, which can be implemented in the radical hysterectomy technique in different clinical settings. The comparative urodynamic study showed a mild functional impairment in the early postoperative period. The most frequent finding was the reduced detrusor activity observed during the voiding phase, consistent with the straining needed to void reported in the questionnaire. These data suggest that a mild bladder impairment occurs despite the conservation of the hypogastric nerve.

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



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Favorable factors for preserving bladder function after nerve-radical hysterectomy: A protocol-based validation study.

Author information

Abstract

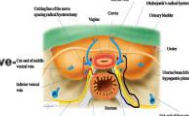
OBJECTIVES: To investigate favorable factors of nerve-sparing radical hysterectomy (NSRH) for preserving the pelvic autonomic nerves and subsequent bladder function and to compare the safety between NSRH and conventional radical hysterectomy (CRH) for cervical cancer.

METHODS: We recruited 87 consecutive patients with IB1-IB4 cervical cancer who underwent NSRH, and reviewed the information of 81 patients who received CRH for historical comparisons. One gynaecologic oncologist performed all operations.

RESULTS: IB1 disease was the only favorable factor for unilateral or bilateral preservation (adjusted OR, 0.245; 95% CI, 0.077-0.774), whereas IB1 disease and squamous cell carcinoma (SqCC) were favorable for bilateral preservation (adjusted ORs, 0.336 and 0.116; 95% CIs, 0.162-0.982 and 0.023-0.581). The median duration of postoperative catheterization (DPC) was different among bilateral, unilateral and failed preservation (median 6 vs 18 vs 90 days, $P < 0.001$). The median DPC was shorter in NSRH patients with stage IB1 disease or SqCC (7 vs 14 days, $P < 0.05$) despite no difference between NSRH and CRH in those with IB2-IB4 disease or non-SqCC. Survival was not different between NSRH and CRH patients.

CONCLUSIONS: IB1 disease and SqCC are favorable for preserving the pelvic autonomic nerves and subsequent bladder function without compromising survival outcomes in patients treated with NSRH.

KEYWORDS: bladder function; cervical cancer; nerve-sparing; pelvic autonomic nerves; radical hysterectomy; survival



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Impact of the radical surgery for cervical cancer on bladder function

CONCLUSIONS:

- Assessment in the pre and posttreatment is important for detect *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*).

Impact of the radical surgery for cervical cancer on bladder function

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.

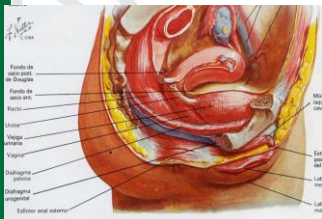
VOIDING DYSFUNCTION AFTER DELIVERY

Postpartum urinary retention (PUR)

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.

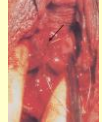
Postpartum urinary retention (PUR)



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

Postpartum urinary retention (PUR)

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 in 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.

Effects on nerve pudendal conduction.

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Pudendal nerve stretch during vaginal birth: A 3D computer simulation

Kuo-Cheng Lien, MS, A Daniel James A. Ashton-Miller, PhD

Effects on pudendal nerve: the stretch of the different branches

Fetal Head Descent (cm)	IR (%)	Per-AS (%)	Per-L (%)	Per-US (%)
0	0	0	0	0
4	~5	~2	~1	~1
6	~15	~5	~3	~2
8	~25	~10	~5	~4
10	~35	~15	~8	~6

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Postpartum urinary retention (PUR)

• Epidural analgesia directly affects bladder sensitivity and contractility.

through the development of pain and subsequent disturbance in bladder sensitivity and also central inhibition of bladder function [27-29].

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Postpartum urinary retention: a systematic review of adverse effects and management

F. E. N. Muller, M. A. Bakker, M. A. Schellekens, J. Langen, J. A. M. Van der Pijl, J. P. W. R. Beenen

Records included in data synthesis (n=26)

Postpartum urinary retention (PUR) is a common phenomenon in the puerperium, with prevalence varying between 1.5% and 45% [1]. In the literature a distinction is often made between patients who cannot void at all (overt postpartum urinary retention) and those who can void, but experience an abnormal post-void residual bladder volume (covert PUR).

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PUR (cannot void at all) : Prevalence, treatment and time

Int Urogynecol J (2014) 25:1605-1612

Table 2 Treatment and recovery for overt PUR (overt postpartum urinary retention)

Reference	Prevalence of PUR (%)	Initial treatment	Time of treatment	Longest treatment
Carley et al. [34]	0.45	CIC and CAD (not specified)	45 % < 48 h; 29 % < 72 h; 25 % self-catheterisation	45 days
Ching-Chung et al. [6]	3.97	CIC followed by CAD	98 % < 72 h	10 days
Fedorkow et al. [33]	0.34	CIC and CAD (not specified)	NA	NA
Foon et al. [28]	2.50	CAD	NA	NA
Glavind and Bjork [5]	0.70	CIC	47 % < 24 h; 33 % < 48 h; 20 % self-catheterisation	21 days
Kekre et al. [4]	0.30	CAD	100 % < 48 h	N/A
Liang et al. [7]	7.40	CIC followed by CAD	65 % 1 x CIC; 23 % 2 x CIC; 11 % CAD	48 h
Liang et al. [29]	12.0	CIC followed by CAD	83 % < 24 h; 53 % < 14 days; 5 % < 72 h	At hospital discharge
Musselwhite et al. [35]	4.70	NA	NA	NA
Olofsson et al. [27]	0.89	CAD	27 % < 72 h; 73 % < 14 days	> 14 days
Rizvi et al. [8]	0.14	CAD	Median time: 72 h	148 h
Too et al. [32]	0.20	CIC and CAD (not specified)	Median time: 19 days	85 days
Yip et al. [1]	4.90	CAD	NA	NA
Lee [30]	8.0	CIC followed by CAD	NA	NA
Sherfine and Danforth [31]	3.0	CAD	Median time: 52 h	96 h

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Abnormal postvoid residual volume (PVRV)

Int Urogynecol J (2014) 25:1605-1612

Table 1 Natural course of covert postpartum urinary retention (PUR)

Reference	Time	Prevalence PUR (%)	Natural course covert PUR
Ramsay and Tubet [45]	Mean 72 h	0.4	NA
Asadi et al. [2]	72 h	1.5	NA
Lee et al. [46]	24 h	14	Day 5: 98 % PVRV < 200 ml
Yip et al. [1, 59]	24 h	9.7	Day 4: 100 % PVRV < 150 ml
Kekre et al. [4]	After 1st void	10	Day 2: 98 % PVRV < 150 ml 2 patients overt PUR; CAD 48 h
Hee et al. [3]	After 1st void	45	Day 3: 92 % PVRV < 100 ml; day 5: 96 % PVRV < 100 ml
Chai et al. [40]	6 h	3.4	Measurements not repeated
Weissman et al. [44]	42 h	7.5	Measurements not repeated
Demaria et al. [43]	72 h	36	Measurements not repeated
Imail and Emery [44]	48 h	37	All patients catheterised; no information on natural course
Liang et al. [7]	6 h	16.7	All patients catheterised; no information on natural course
Van Os and Van den Linden [42]	6 h	32	All patients catheterised; no information on natural course
Lee [30]	< 18 h	8	All patients catheterised; no information on natural course
Buchanan and Beckmann [36]	4 h	5.1	Day 4: 97 % PVRV < 150 ml

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Int Urogynecol J (2014) 27:55–60
DOI 10.1007/s00192-013-2768-8

ORIGINAL ARTICLE

Delivery-related risk factors for covert postpartum urinary retention after vaginal delivery

Femke E. M. Mulder¹ · Katrien Oude Rengerink¹ · Joris A. M. van der Post¹ · Robert A. Haksvoort¹ · Jan-Paul W. R. Roovers¹

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

Characteristic	Value
Maternal age (years), mean (range)	31 (16–46)
BMI (kg/m ²), median (range)	24 (16–64)
Parity, median (range)	1.8 (1–8)
Spontaneous vaginal delivery, n (%)	651 (87)
Instrumental delivery, n (%)	94 (13)
Epidual analgesia, n (%)	141 (19)
Opioid analgesia, n (%)	121 (16)
Episiotomy, n (%)	131 (18)

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Table 3 Multivariable regression analysis including factors with $p < 0.20$ in the univariable analysis (Table 2; maternal age, BMI and augmentation were not included)

Clinical factor	PVRV ≥ 150 mL		PVRV ≥ 250 mL		PVRV ≥ 500 mL	
	OR	95% CI	OR	95% CI	OR	95% CI
Primiparous (yes/no)	1.26	0.83–1.81	1.13	0.75–1.70	1.60	0.77–3.33
Duration of labour (per minute)	1.00	1.00–1.00	1.00	1.00–1.00	1.00	1.00–1.00
Duration of second stage (per minute)	1.00	1.00–1.01	1.01	1.00–1.01	1.00	0.98–1.01
Opioid analgesia (yes/no)	1.18	0.77–1.81	1.80*	1.13–2.84	3.19*	1.86–6.08
Epidual analgesia (yes/no)	2.08*	1.36–3.19	2.07*	1.32–3.26	3.54*	1.64–7.66
Instrumental delivery (yes/no)	1.35	0.78–2.34	0.85	0.48–1.49	1.15	0.52–2.52
Birth weight (kg)	1.03*	1.01–1.06	1.04*	1.01–1.07	1.03	0.97–1.08
Vaginal tears (yes/no)	1.97	0.76–5.52	0.86	0.57–1.29	1.53	0.64–3.68
Episiotomy (yes/no)	1.67*	1.02–2.71	2.53*	1.53–4.20	3.72*	1.71–8.08

* $p < 0.05$

- After selection of possible risk factors through univariable regression, **multivariate analysis revealed epidural analgesia, birth weight and episiotomy as independent risk factors for PVRV ≥ 150 mL.**
- 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.

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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.

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Table 2 UDI-6 questionnaire scores 3 months after delivery

	CIC group (n = 34)		TIC group (n = 34)		p value
	Mean	Standard deviation	Mean	Standard deviation	
UDI-6 total score	10.9	14.2	8.3	10.0	0.42
Irritative symptoms	11.1	17.9	9.09	13.3	0.63
Stress symptoms	12.4	19.4	9.6	15.6	0.55
Obstructive symptoms	9.3	19.8	6.1	10.1	0.45

CIC clean intermittent catheterization, TIC transurethral indwelling catheterization

Comparison of clean intermittent and transurethral indwelling catheterization for the treatment of covert urinary retention after vaginal delivery: a multicentre randomized controlled clinical trial

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

Bladder emptying normalized earlier with CIC than with TIC

Time to resumption of adequate voiding after delivery	CIC group (n = 37)	TIC group (n = 44)	p value
Within 24 h	64.9% (n = 24)	–	–
Number of catheterizations			
One	35% (n = 13)	–	–
Two	22% (n = 8)	–	–
Three	8% (n = 3)	–	–
At 24 h	78.4% (n = 29)	84.1% (n = 37)	–
At 48 h	94.6% (n = 35)	86.4% (n = 38)	–
At 72 h	94.6% (n = 35)	97.7% (n = 43)	–
After >72 h	100% (n = 37)	100% (n = 44)	–
Median duration of catheterization (h)	12 (0–768)	24 (24–72)	0.01

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Postpartum urinary retention (PUR)

- If retention persists, **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.

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Int Urogynecol J
DOI 10.1007/s00192-017-3457-6 2017

ORIGINAL ARTICLE

Long-term micturition problems of asymptomatic postpartum urinary retention: a prospective case-control study

Femke E. M. Mulder¹ · Robert A. Haksvoort² · Jan-Peter de Bruin³ · Erica W. Jansen⁴ · Joris A. M. van der Post¹ · Jan-Paul W. R. Roovers¹

Methods After the first spontaneous void post-vaginal delivery, PVRV was measured using a portable scanning device. Micturition symptoms were compared using validated questionnaires between women with PVRV < 150 mL and those with PVRV ≥ 150 mL until 1 year after delivery. Women with PVRV ≥ 150 mL were followed until complete bladder emptying was achieved.

Results Data of 105 patients with PVRV < 150 mL and 119 with PVRV ≥ 150 mL were available for analysis. 75% of all patients included had PVRV ≥ 250 mL. More primiparous patients had PVRV ≥ 150 mL ($p < 0.02$), 92% of women with PVRV ≥ 150 mL after delivery were able to adequately empty their bladder within 4 days. One year after delivery, no statistically significant differences were found.

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Int Urogynecol J
DOI 10.1007/s00192-017-3457-6

2017

ORIGINAL ARTICLE

Long-term micturition problems of asymptomatic postpartum urinary retention: a prospective case-control study

Femke E. M. Mulder¹ · Robert A. Hakvoort² · Jan-Peter de Bruin³ · Erica W. Janszen⁴ · Joris A. M. van der Post¹ · Jan-Paul W. R. Roovers¹

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.

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Postpartum urinary retention (PUR)

Acute postpartum urinary retention (APUR) can be a serious complication after childbirth?

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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

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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

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Tufan Tarcan, MD, PhD 

Affiliations to disclose†:

None




† All financial ties (over the last year) that you may have with any business organisation with respect to the subjects mentioned during your presentation

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Institution (non-industry) funded

Sponsored *Abdi Ibrahim*
by:


  

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

Transient 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 aetiology was found. Approximately half of those who successfully voided did so with no treatment.



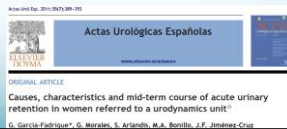
ORIGINAL ARTICLE
Aetiology and management of acute female urinary retention

Imran Ahmad^{1,2*}, Nalagatta Sarath Krishna³, Douglas Ramsay Small⁴, Ian Graeme Conn⁵

British Journal of Medical & Surgical Urology
www.bjmsu.com

So, transient factors should be carefully assessed and more invasive evaluation should be spared for persistent cases.

Conclusions: In our experience, AUR in the female is mainly related to underlying neurologic/urogynecologic disease, even though the etiology could not be known in a significant percentage of patients. Half of the patients recovered completely and did not require any treatment.



Actas Urol Esp. 2011;39(7):399-399

Actas Urológicas Españolas

ORIGINAL ARTICLE

Causes, characteristics and mid-term course of acute urinary retention in women referred to a urodynamics unit*

G. García-Fabrigue^a, G. Morales, S. Artalejo, M.A. Borillo, J.F. Jiménez-Cruz

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

The type of onset and age

There is a specific event that triggers FUR in about half of the pts

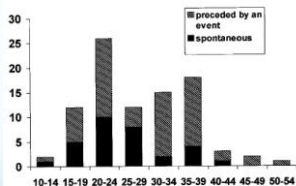


FIG. 2. Age distribution of women at initial complete urinary retention episode and role of specific events related to onset.

THE CAUSE AND NATURAL HISTORY OF ISOLATED URINARY RETENTION IN YOUNG WOMEN
MICHAEL J. SWINN, OLIVER J. WISEMAN, ETHENE LOWE and CLARE J. FOWLER
From the Department of Urothoracic, National Hospital for Neurology and Neurosurgery, London, United Kingdom

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, and/or failure to achieve complete 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 ICS 2017 FLORENCE

- 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

0002-0406/05/27(10)1035-1038
The Journal of Urology
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Vol. 173, No. 10, October 2005
Printed in U.S.A.

THE CAUSE AND NATURAL HISTORY OF ISOLATED URINARY RETENTION IN YOUNG WOMEN

MICHAEL J. SWINN, OLIVER J. WEISMAN, EITHNE LOUW, and CLARE J. FOWLER
From the Department of Uro-Neurology, National Hospital for Neurology and Neurosurgery, London, United Kingdom

UPP and TV-US may predict EMG abnormality in idiopathic FUR ICS 2017 FLORENCE

- Concentric needle EMG is not commonly performed
 - requires special equipment
 - technical expertise
 - experienced investigator
- MUCP and urethral sphincter complex volume on TV-US are higher in women in urinary retention who have the characteristic EMG abnormality
 - hypothesis is that overactivity leads to enlargement of the striated element of the sphincter core

0002-0406/05/27(10)1035-1038
The Journal of Urology
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Vol. 173, No. 10, October 2005
Printed in U.S.A.

MAXIMUM URETHRAL CLOSURE PRESSURE AND SPHINCTER VOLUME IN WOMEN WITH URINARY RETENTION

OLIVER J. WEISMAN, MICHAEL J. SWINN, CIARAN M. BHADY, and CLARE J. FOWLER
From the Department of Uro-Neurology, National Hospital for Neurology and Neurosurgery, London, United Kingdom

ICS 2017 FLORENCE

available at www.sciencedirect.com
journal homepage: www.europaneurology.com

EAU
European Association of Urology

Neuro-urology – Voiding Dysfunction

The Presence of Fowler's Syndrome Predicts Successful Long-Term Outcome of Sacral Nerve Stimulation in Women with Urinary Retention

Dirk De Ridder^{a,*}, Dieter Ost^b, Frans Bruyninckx^b

Neurology and Uroynamics 36:528-534 (2007)

Psychogenic urinary retention ICS 2017 FLORENCE

- 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.

Neurology and Uroynamics 36:528-534 (2007)

Psychogenic Urinary Dysfunction: A Uro-Neurological Assessment

Kiyoo Sakakibara,^{a,*} Tetsuroshi Uchiyama,^a Yasuhiro Aoyagi,^b Sho Ito,^c Takahiro Yamamoto,^d Takashi Ito,^e Kazuo Yamamoto,^f Mika Kikuchi,^g Chikako Yonemitsu,^h Tomoyuki Yamashita,ⁱ and Keiichi Takamizawa^h

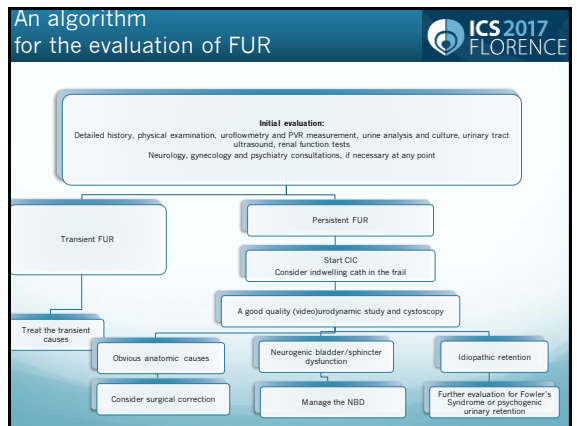
Psychogenic urinary retention ICS 2017 FLORENCE

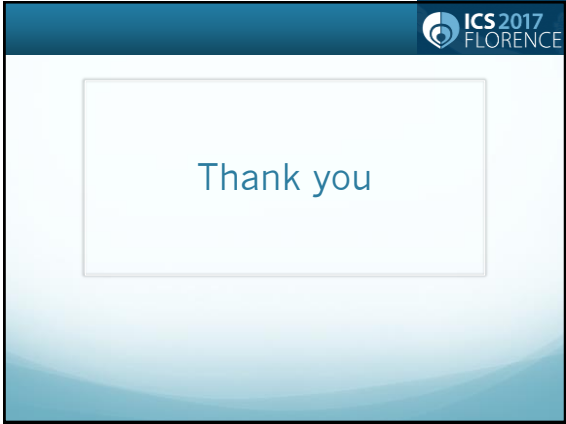
- The characteristics of urodynamics in PUD are increased bladder sensation during bladder filling and underactive/acontractile detrusor during voiding.
 - None had DO or DSD
- Regarding neuropsychiatric aspects, PUD is usually accompanied by more obvious psychogenic/psychiatric features.
 - The majority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

Neurology and Uroynamics 36:528-534 (2007)

Psychogenic Urinary Dysfunction: A Uro-Neurological Assessment

Kiyoo Sakakibara,^{a,*} Tetsuroshi Uchiyama,^a Yasuhiro Aoyagi,^b Sho Ito,^c Takahiro Yamamoto,^d Takashi Ito,^e Kazuo Yamamoto,^f Mika Kikuchi,^g Chikako Yonemitsu,^h Tomoyuki Yamashita,ⁱ and Keiichi Takamizawa^h





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Urinary retention in women Conservative management

C. Naranjo-Ortiz, PT, PhD

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Affiliations to disclose[†]:

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Urinary retention in women Conservative management

C. Naranjo-Ortiz, PT, PhD

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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

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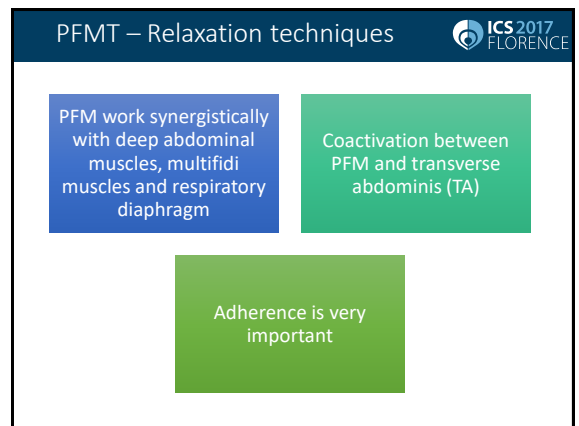
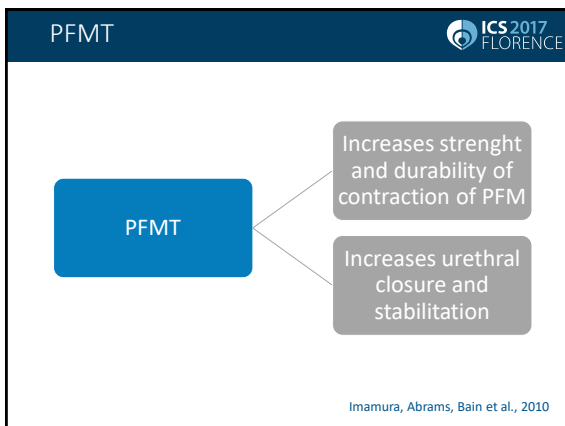
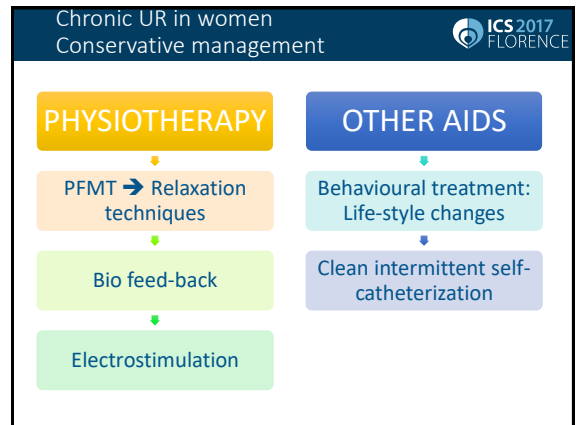
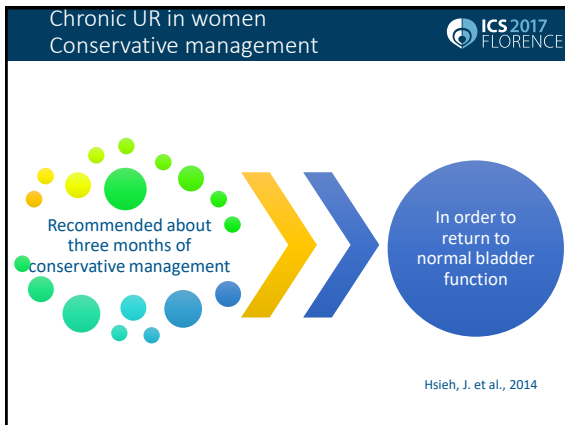
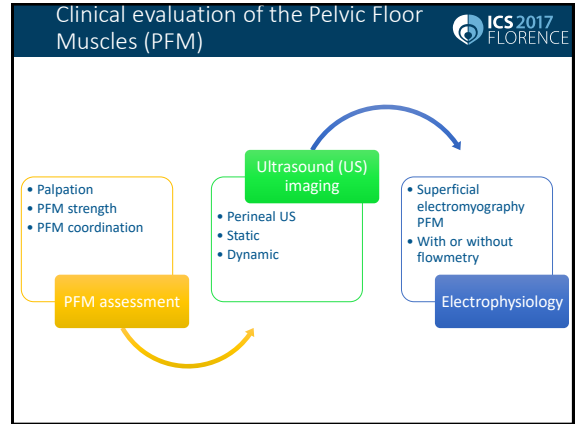
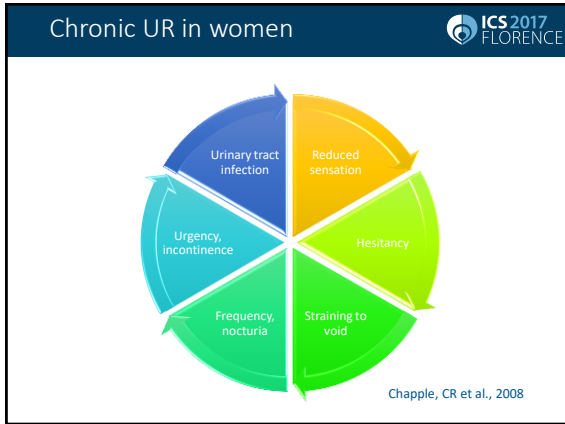
UR in women

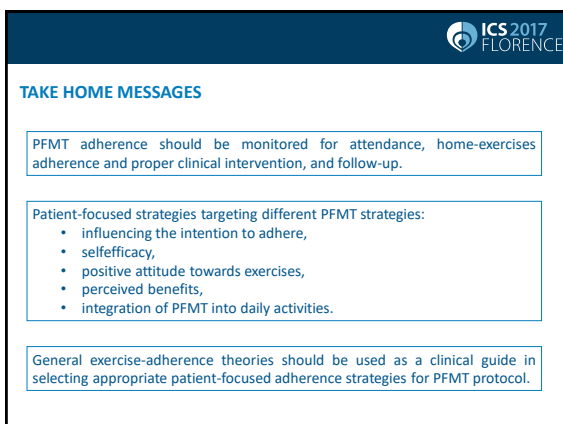
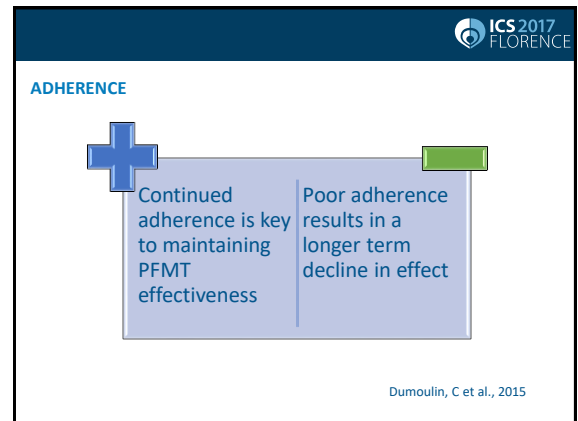
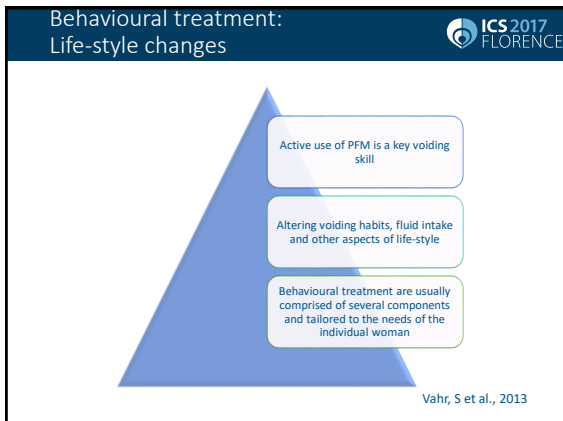
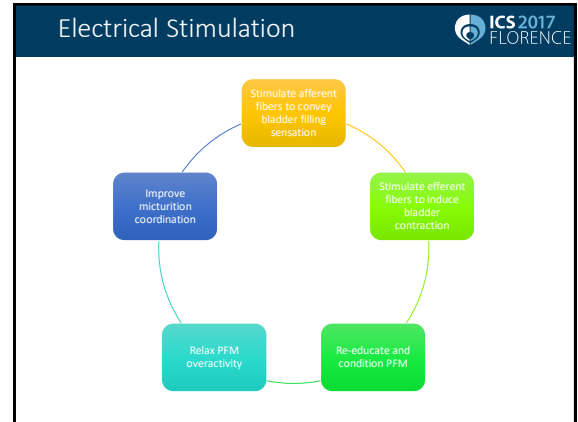
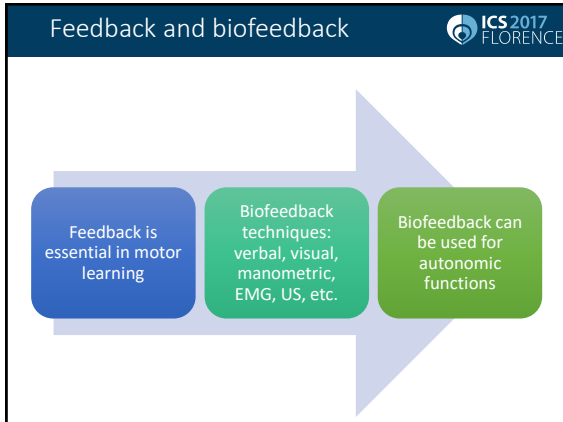
Soumendra, N et al, 2007

ICS 2017 FLORENCE

Acute UR in women


Rena, D et al., 2014






Management of Female Urinary Retention

- Medical and Surgical



The University of Sheffield
Sheffield Teaching Hospitals NHS Foundation Trust


Christopher Chapple
Sheffield Teaching Hospitals
NHS Foundation Trust
UK



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Workshop 21
- Urinary Retention in Women

Christopher Chapple



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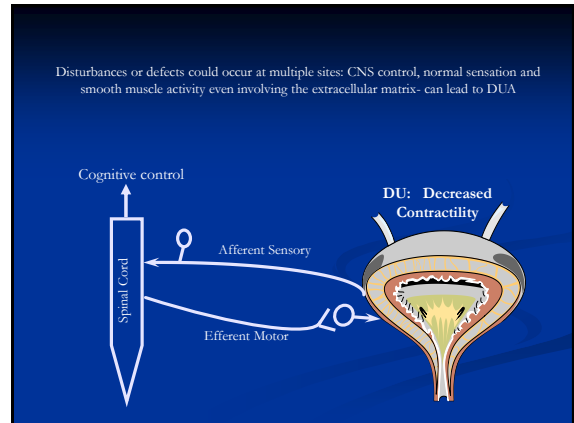
Causes of female Retention

ANATOMICAL

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

FUNCTIONAL

- Underactive Bladder
- Bladder neck obstruction
- Pseudodyssynergia
- Neurological
- Fowler's syndrome



Aetiological factors In DUA/UAB

Neurogenic injury/disease

- Vascular: Stroke (early phase)
- Degenerative: Parkinson's Disease, Multi-system atrophy (MSA), Demyelinating neuropathies
- Multiple sclerosis
- Peripheral neuropathies: Guillaine-Barre syndrome, Neurosyphilis (tabes dorsalis), Herpes-Zoster/Herpes simplex
- Diabetes mellitus, AIDS
- 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

Idiopathic
Normal Ageing
Unknown factor in younger people

Functional
Fowler's syndrome
Dysfunctional voiding

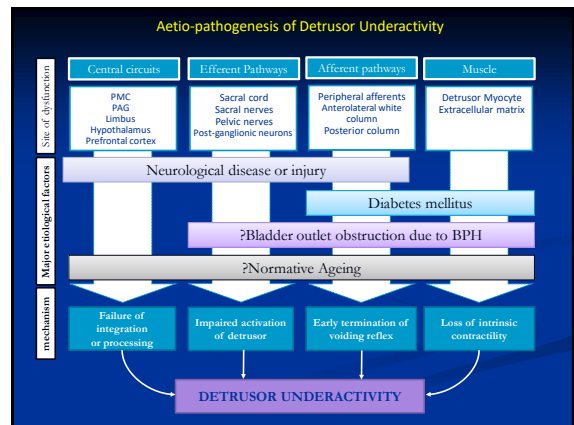
Myogenic
Bladder outlet obstruction
Diabetes

iatrogenic

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

Pharmacotherapy
Drugs with anticholinergic effects

- Anti-muscarinics
- Anti-histamines
- Anti-psychotics
- Anti-Parkinson's medications
- Anti-spasmodics
- Tricyclic antidepressants
- Opioids



Physiological Measures

Type	Method	Advantages	Limitations
Mathematical Calculations	Watts Factor	1) Measure of bladder power 2) Minimally dependent on volume of urine 3) Over affected by presence of BBO	1) Lengthy and complex calculation 2) No validated thresholds 3) Does not measure sustainability of contraction
			$WF = \frac{(p_{det} + a)(v_{det} + b) - ab}{2t}$
Indices	Detrusor shortening velocity Detrusor contraction coefficient (DCCO) Bladder contractility index (BCI)	1) Easy to use 2) Measurement easy to obtain 3) Evaluation of isometric contraction	1) Does not measure sustainability of contraction 2) May not be applicable to other groups 3) Does not conceptually consider co-existence of BBO and DU
			Projected isovolumetric pressure (PdetIso) = $P_{det} \times Q_{max} + S \times Q_{max}$ Bladder Contractility Index (BCI) (strong >150, normal 100-150 and weak <100)
Occlusion testing	Voluntary stop test Mechanical stop test Continuous occlusion	1) Real time indication of isovolumetric contraction strength 2) No calculations	1) Noisy/irritating/painful for patients 2) Subjective 3) No information on sustainability of contraction in (continuous occlusion) 4) May underestimate isovolumetric pressure (stop test) 5) Unusable in some patient groups
			PdetIso
Ranges of urodynamic measurements	Pdet@Qmax (eq:49) Qmax (eq:15)	1) Simple to use	1) Not widely accepted "normal" ranges 2) Does not estimate contraction strength 3) Does not conceptually consider co-existence of BBO and DU
			$v_{det} = Q/2[B/(V + V_0)/4n]^{0.66}$

Conservative management

- Behavioral interventions
 - Scheduled voiding
 - Double voiding
 - Straining?
- Pelvic floor physiotherapy and Biofeedback
- Catheterisation
 - Intermittent self catheterisation
 - Indwelling (suprapubic) catheter

Catheterisation

Indwelling catheter



Suprapubic catheter



Intermittent catheter

Clean intermittent self-catheterisation:

- Most prevalent method of bladder management in patients with UAB
- Complications rare compared with indwelling/suprapubic catheters
 - UTI, urethral trauma, urethritis, epididymo-orchitis and urethral bleeding
- However, many patients find the technique difficult

Pharmacological agents to facilitate bladder emptying

No effective pharmacotherapy for UAB exists

Increasing intravesical pressure/bladder contractility

- Parasympathetic agents (bethanechol, distigmine)
- Prostaglandins
- Blockers of inhibition
- Opioid receptor antagonists

Decreasing outlet resistance

- α -adrenergic receptor antagonists (phenoxybenzamine, prazosin, terazosin / doxazosin, alfuzosin / tamsulosin, silodosin)
- Benzodiazepines
- Baclofen
- Dantrolene
- Botulinum toxin
- Anti-androgens for reducing prostatic size, e.g. finasteride]

- Available studies do not support the use of parasympathomimetics¹
 - 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 monotherapy²

1. Baumbach BJ. J Urol 2007;178:749-52. 2. Yamashita Da. J Urol 2004;171:88-96.

Electrical stimulation

Intravesical stimulation (IVES)



Brindley device (S2, S3, S4 nerve roots)

Brindley device¹

- Ventral root stimulation +/- dorsal root section / sacral deafferentation
- Requires intact neural pathway and a bladder capable of contracting (generally used for SCI patients)
- Post-stimulus voiding:
 - Relaxation time of striated sphincter is shorter than the relaxation time of the detrusor smooth muscle
- Limitations: Voiding may occur in spurts at above-normal bladder pressures

Sacral nerve modulation

- In patients with retention (n=31)², achieved decrease in:
 - mean volume per catheterisation (379.9 ± 183.8 to 199.2 ± 184.5 mL)
 - mean number of catheterisations (5.3 ± 2.8 to 1.9 ± 2.8)

Sacral nerve modulation

- Used for idiopathic urinary retention

Effective, but invasive

1. Brindley J Physiol 1974;217:157-162. 2. Von Kretzschmar J Urol 2007;178:2029-34. 3. Igawa. Jpn. J Urol. Prog. Basic Res. 2004;152:163-74. 4. 1, 3, 4. Jpn. J Urol. 1997;67:1100-1105.



ABSTRACT

Higher incidence of functional urinary bladder dysfunction (detrusor overactivity – DO and detrusor underactivity – DU) occurs in elderly people. Effective therapy is widely used in patients with DO, in contrast DU seems to be a serious burden for the older population due to the lack of successful treatment. The aim of the study was to review the potential pharmacological targets in DU treatment in the animal model. This review is based on systemic literature research. The Medline/PubMed, Scopus, Embase, and Web of Science databases were searched in order to identify original and review articles, as well as editorials relating to underactive bladder, detrusor underactivity. The following Medical Subject

models, humans and therapy. 19 papers met the criteria and were included for this review. 19 papers met the criteria and were included for this review. The pathophysiology of DU and its animal models were described. Moreover, the potential pharmacological targets in DU therapy were discussed, such as bombesin receptors, prostaglandin, ATP, NO, CCNP, SP, Dopamine, NGF, MS, and agrin-dependent pathways. In conclusion, due to the lack of effective treatment strategies in DU, further research is necessary. Close cooperation between urologists and pharmacologists should be maintained for optimal research on DU pharmacotherapy.

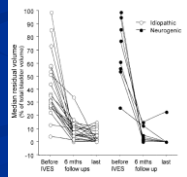
© 2016 Institute of Pharmacology, Polish Academy of Sciences. Published by Elsevier Sp. z o.o. All rights reserved.

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 trials lacking
- Achieved long-term normalisation of voiding in 20/24 (83%) children with idiopathic, and 8/20 (40%) with neurogenic, underactive detrusor²

- 10 daily 60 min session (5 b.i.d. 20 min sessions in 22 pts) followed by home treatment (2-3 times weekly) until bladder function normalised/no further improvement
- In responsive children (at 6 months):
 - median residual volume decreased (75 mL (range 6-415) to 22 mL (range 0-338); $p < 0.0001$)
 - median voided volume increased (80 mL (range 0-625) to 220 mL (range 30-636); $p < 0.0001$)
- Effects stable for 2 years
- Catheterisation discontinued in 11/15 cases

IVES induced change in residual urine volume of individual responsive children²



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

- | | |
|--|---|
| <ul style="list-style-type: none"> ANATOMICAL Gynae; POP, fibroids Post surgical Urethral stenosis/diverticulum Ureterocele Foreign body | <ul style="list-style-type: none"> FUNCTIONAL Underactive Bladder Bladder neck obstruction Pseudodyssynergia 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)
- Urethrolisis

Traditional Slings

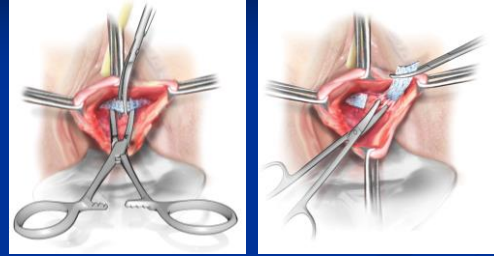
- Sling Incision (PV sling)
- Urethrolisis
 - Transvaginal
 - Retropubic
 - Suprameatal (infrapubic)
- Cut suspension/sling sutures
 - No published peer-reviewed series

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 Nitti's personal communication

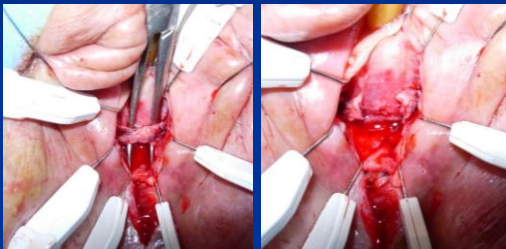
Midurethral Synthetic Sling Incision



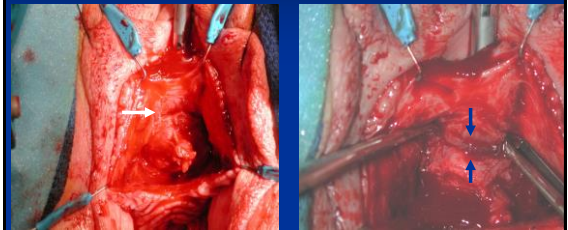
- If the sling is difficult to identify, can go lateral to the midline especially for TO slings
- It is critical to identify the sling with certainty (consider pathologic confirmation)

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

Obstructing Midurethral Sling at 11 months



Obstructing Midurethral Sling Complete Retention at 3 months



TVT Take Down Results

	N	Type	Success
Klutke, et al ^{1*}	17	Midline Incision	100% normal emptying
Rardin, et al ^{2**}	23	Midline Incision Loosening	100% normal emptying 30% complete, 70% partial resolution of storage sx

* Recurrent SUI in 6%

** Significant recurrent SUI 13%

20% recurrent SUI, but significantly better than prior to TVT

1. Klutke C, et al. *Urology* 2001;58:697-701.
2. Rardin CR, et al. *Obstet Gynecol* 2002;100:898-902.

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

Molden, S et al *FPMRS* 2010;16:340-44

- 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

	<i>N</i>	<i>Type</i>	<i>Success</i>	<i>SUI</i>
Nitti, et al ¹	19	Midline Incision	84%	17%
Amundsen, et al ²	32	Various	94% retention 67% UUI	9%
Goldman ³	14	Midline Incision	93%	21%

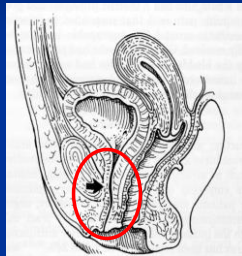
1. Nititi VW, et al. Urology 2002;59:47-52.
2. Amundsen CI, et al. J Urol 2000;164:434-7
3. Goldman HB 2003;62:714-8

Formal Urethrolisis: 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

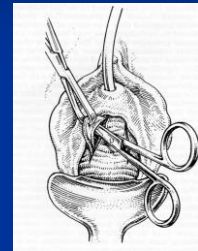
Urethrolisis - Anatomy

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



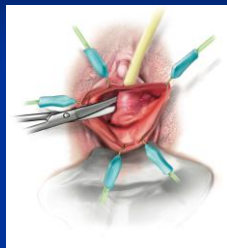
Transvaginal Urethrolisis

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



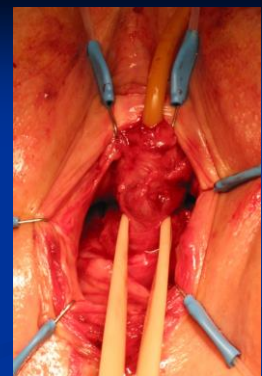
Transvaginal Urethrolisis

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



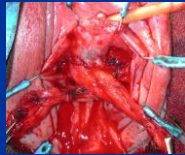
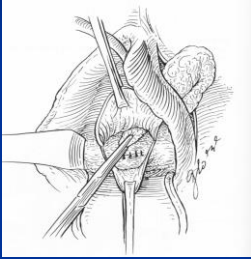
Illustrations from Vaginal Surgery for The Urologist
Nitti VW, Rosenblum N, Brucker BM Elsevier, 2012

- Place penrose drain around the urethra



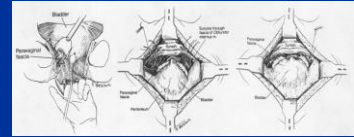
Transvaginal Urethrolisis

Optional - Interposition of Martius Flap



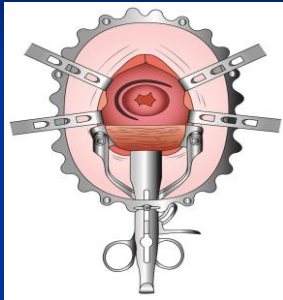
Retropubic Urethrolisis

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



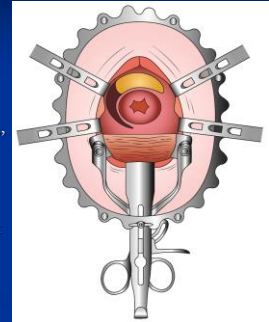
Suprameatal Urethrolisis

- Curved incision above the urethra



Suprameatal Urethrolisis

- 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



Urethrolisis Results

	<i>N</i>	<i>Type</i>	<i>Success</i>	<i>SUI</i>
Poster & McGuire	48	Transvaginal	65%	0
Nitti & Raz	42	Transvaginal	71%	0
Cross, et al	39	Transvaginal	72%	3%
Goldman, et al	32	Transvaginal	84%	19%
Petrou, et al	32	Suprameatal	67%	3%
Webster & Kreder	15	Retropubic	93%	13%
Petrou & Young	12	Retropubic	83%	18%
Carr & Webster	54	Mixed	78%	14%

Repeat Urethrolisis

Scarpero, et al, J Urol, 2003;169:1013-1016

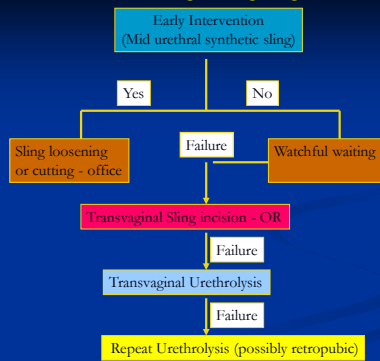
Urgency Incontinence

- 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



Summary

- Clinically significant obstruction after sling surgery incontinence surgery may not be “common” but occurs even in the most experienced hands
- Sling incision and urethrolisis, 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
 - Ureterocele
 - Foreign body
- FUNCTIONAL
 - Underactive Bladder
 - Bladder neck obstruction
 - Pseudodyssnergia
 - Neurological
 - **Fowler’s syndrome**

Abnormal electromyographic activity of the urethral sphincter, voiding dysfunction, and polycystic ovaries: A new syndrome?

Clare J Fowler, Timothy J Christman, Christopher R Chapple, Helen Fitzmaurice Parkhouse, Roger S Kirby, Howard S Jacobs

BMJ volume 297 3 DECEMBER 1988

Abstract
A potential association between abnormal electromyographic activity—that is, decelerating bursts and complex repetitive discharges—of the urethral sphincter and difficulty in voiding was examined in 57 women with urinary retention. Abnormal electromyographic activity was found in 31. Ultrasonography of the ovaries in 22 of the 35 women showed that 14 had polycystic ovaries. Of the other eight women, two had had oophorectomies, one had stenotic ovaries and ovarian failure, and one had previously undergone oophorectomy and the other ovary could not be seen in one neither ovary could be seen, and three had ovaries of normal appearance, although two of these women were taking the contraceptive pill. Thirteen of the group had endocrine symptoms and signs characteristic of the polycystic ovary syndrome. Videocystometry in 17 of the women who were examined by ultrasonography showed low flow rates and high residual volumes of urine after micturition in 13 women who could void, the other five having chronic urinary retention.

A speculative hypothesis for the observed association of impaired voiding, abnormal electromyographic activity of the urethral sphincter, and polycystic ovaries is advanced, based on the relative progesterone deficiency that characterises the polycystic ovary syndrome. Progesterone stabilises membranes, and its depletion might permit synaptic transmission of impulses between muscle fibres in the muscle of the urethral sphincter, giving rise to the abnormal electromyographic activity. This may impair relaxation of the sphincter, resulting in low flow rates of urine, incomplete emptying of the bladder, and, finally, urinary retention.

than normal ovaries (mean volume 5.8 ml (4.6 to 7.3), with a highly echogenic and dense central stroma and numerous (>10) peripherally located cysts of 4.6 mm in diameter). When associated with hirsutism, acne, skin, obesity, menstrual irregularity, and infrequent polycystic ovary syndrome may be the diagnosis. This condition is associated with increased concentrations of circulating androgens and circulating hormones (with normal concentrations of follicle stimulating hormone) and, in 30% of cases, hyperandrogenism and occurs in 25% of women with amenorrhoea and 90% of those with hirsutism.¹

Patients and methods

Fifty seven women with difficulties in voiding were referred to the department of clinical neurophysiology at the Middlesex Hospital during 1982-8 for electromyography of the urethral sphincter. The indication was retention of urine or dysfunction of voiding. The referring doctors were aware of our interest in the electromyographic abnormality, and patients were clearly selected. Each patient underwent electromyography of the urethral sphincter with a concentric needle electrode,² and abnormal electromyographic activity (that is, decelerating bursts and complex repetitive discharges) was found in 31. Pelvic ultrasonography was carried out in 22 of the 35 women (the other 13, who had been early subjects and as secondary referrals from long distances could not be readily recalled, were not available). Ultrasonography was performed by one of two experienced radiographers with a MHz long focused transducer attached to an Aloka 720 high resolution sector scanner. A history of pelvic operations or menstrual irregularity and the presence of hirsutism or acne were recorded.

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

PRIZE AWARD: Best Clinical Abstract (Joint Prize)

213

Kavva R¹, DesGupta R¹, Critchley H², Fowler C¹, Griffiths D³
 1. National Hospital for Neurology and Neurosurgery, 2. University of Sussex, 3. University of Pittsburgh

ABNORMAL BRAIN RESPONSES TO BLADDER FILLING IN YOUNG WOMEN WITH URINARY RETENTION AND EFFECT OF SACRAL NEUROMODULATION

Hypothesis / aims of study

A subset of young women with chronic urinary retention of a particular pathogenesis may have little bladder sensation and be unable to contract the detrusor. In this condition voiding is impaired or impossible and catheterization is usually necessary. The condition is characterized by elevated maximum urethral closure pressure (MUCP) and abnormal EMG recordings from the striated urethral sphincter. Impairment of filling sensation suggests that bladder afferent signals reaching the brain may be weak or absent. Sacral neuromodulation (SNM) does not alter the sphincter abnormally but does restore a degree of bladder sensation and the ability to micturate. The aims of this study were therefore to use functional magnetic resonance imaging (fMRI) of the brain to determine cerebral responses to bladder filling before and after SNM. We hypothesized that altered responses at baseline in the patients may be restored by SNM.

pro-continence reflex. Consequently the PAG and the rest of the brain receive little input, thus reducing bladder sensation and contractility.

Concluding message

In this condition of urinary retention, an involuntarily overactive sphincter exaggerates the spinal pro-continence reflex. By suppressing bladder afferents, PAG activation is blocked, sensation eliminated and detrusor contraction inhibited. SNM appears to re-open afferent pathways to the brain, thus re-enabling sensation and voiding.

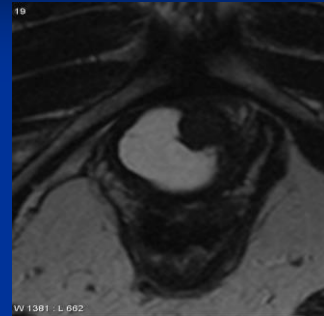
EMG-negative Fowler's syndrome

- "Non-Fowler Fowler's syndrome"
- Baclofen
- Supportive measures and follow up
- Mitrofanoff procedure

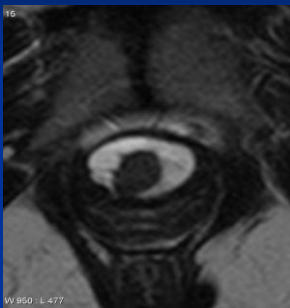
Causes of female Retention

- | | |
|--------------------------------------|----------------------------|
| ■ ANATOMICAL | ■ FUNCTIONAL |
| ■ Gynae; POP, fibroids | ■ Underactive Bladder |
| ■ Post surgical | ■ Bladder neck obstruction |
| ■ Urethral stenosis/
diverticulum | ■ Pseudodyssynergia |
| ■ Ureterocoele | ■ Neurological |
| ■ Foreign body | ■ Fowler's syndrome |

U-Shaped



Circumferential





Pre-operative assessment

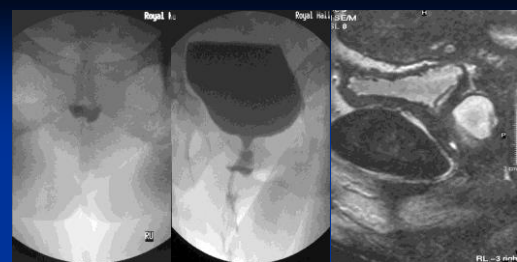
- How large is it?
- Is it asymptomatic?
- Only treat if symptomatic
- Physical examination
 - ? Cystocele
 - ? Stress incontinence
- ? Need for urodynamics
- Is there infection present?
 - MSU

Female urethral diverticula Treatment

- Palliative
 - Endoscopic incision
- Curative
 - Marsupialisation
 - Excision
 - Excision & Young – Dees reconstruction

Excisional Surgery -tips

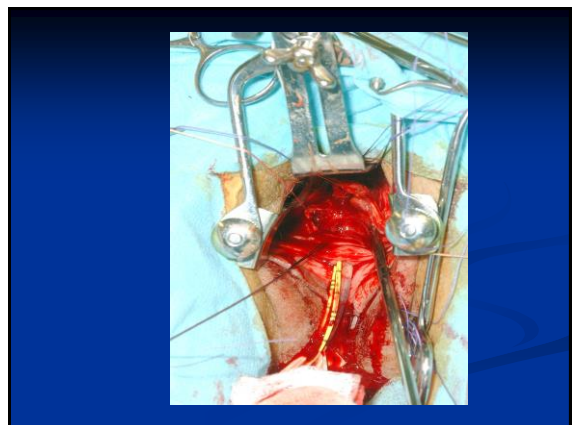
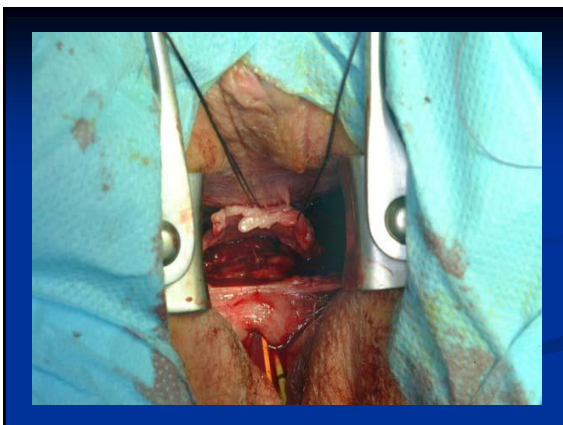
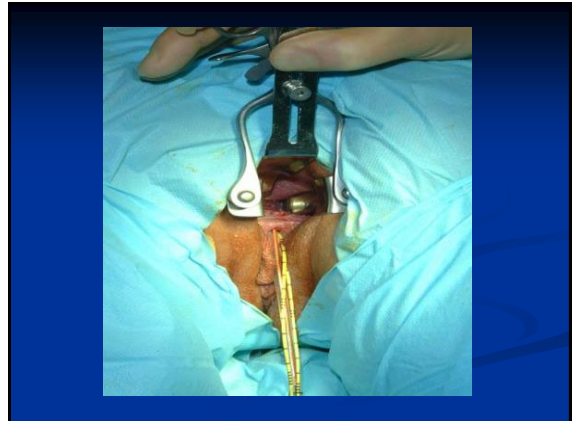
- Sim's Position rather than standard lithotomy
- Self retaining retractor –eg Parkes
- Good light
- Suction
- Infiltrate with fluid (adrenaline)

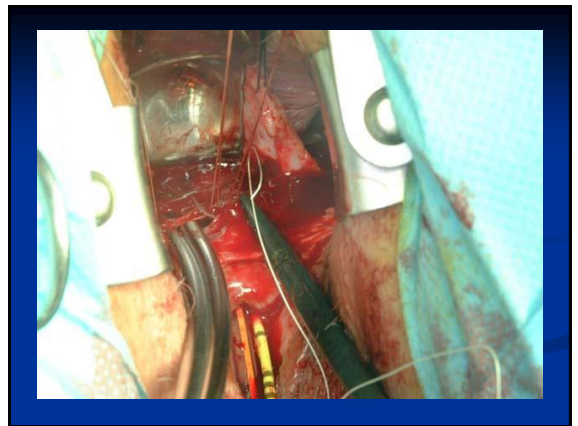
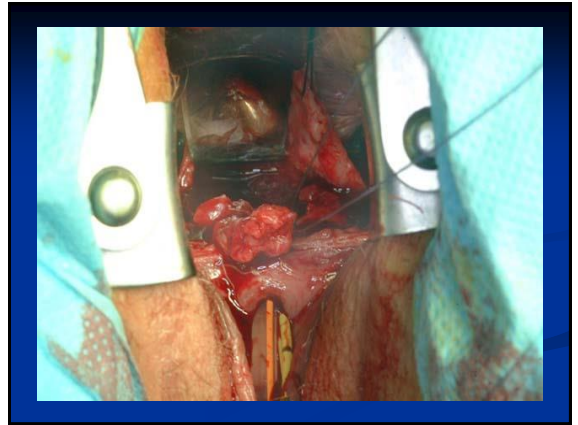
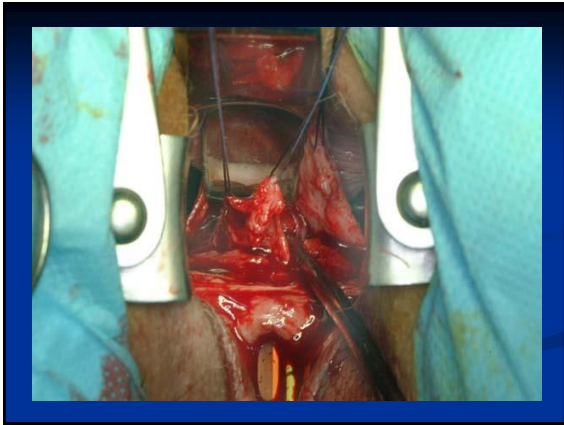
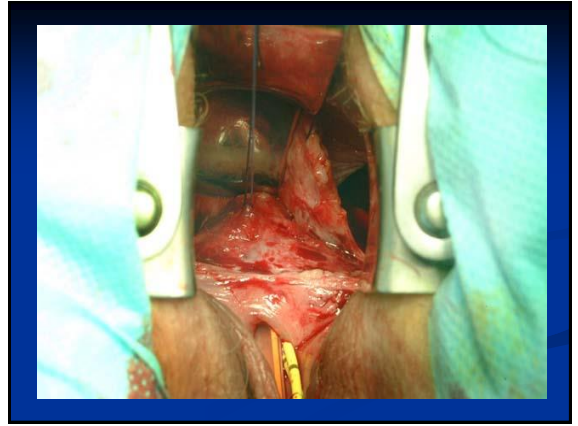
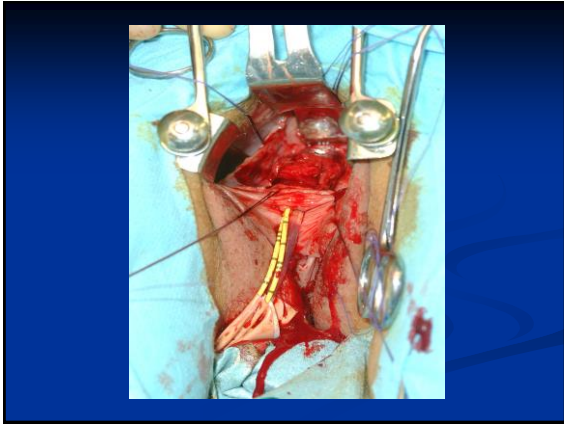


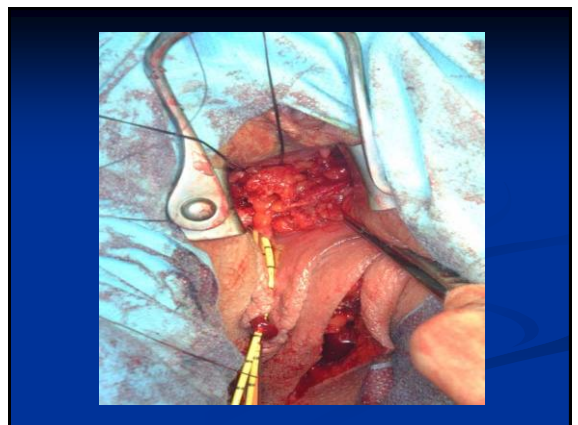
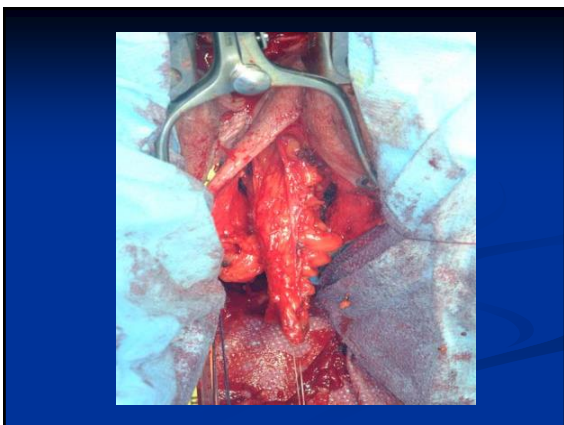
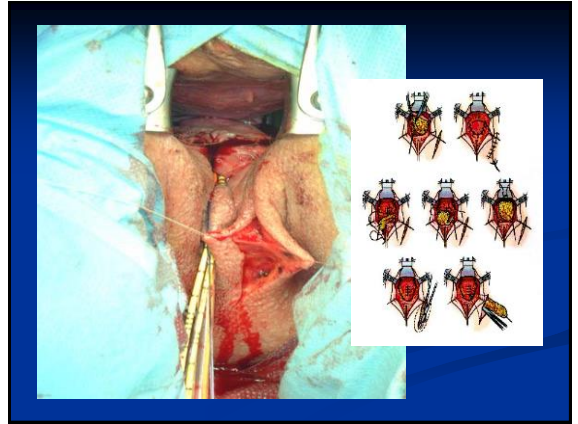
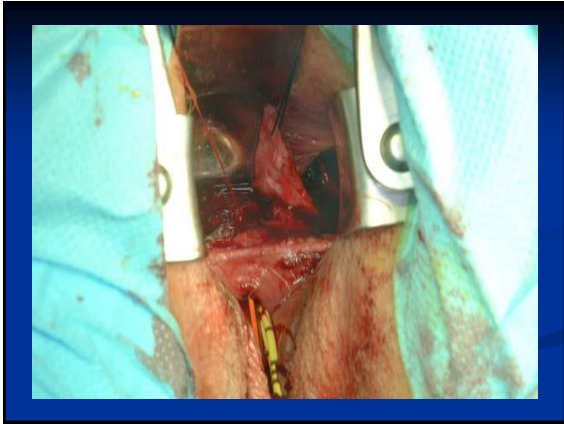
Urodynamic films and subsequent MRI
–note extension behind bladder

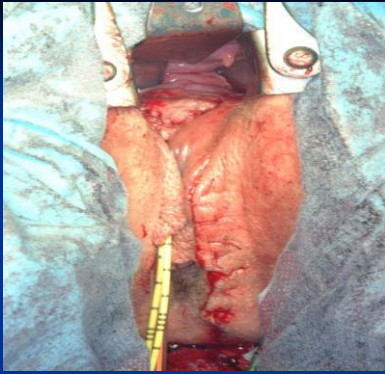
Technique

- '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









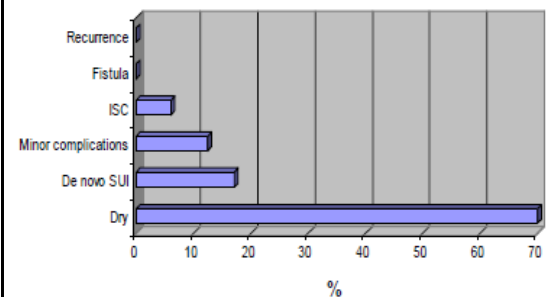
Post-operative Management

- 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 multi-lobulated. 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.

Dysuria	75%
Pelvic pain	72%
Dyspareunia	50%
Frequency	46%
Pus PU	44%
SUI	38%
Urgency	34%
Infection	34%



Summary

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

Female strictures

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

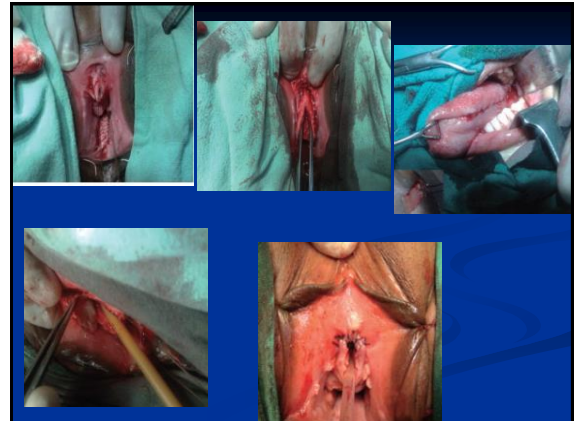
Surgical Options – Vaginal Flap

- Vaginal Flap urethroplasty first described in 1935

Harris Surg Gynes Obstet 1935 61: 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