

W26: Urinary retention in women

Workshop Chair: David Castro-Diaz, Spain

16 September 2016 13:30 - 15:00

Start	End	Topic	Speakers
13:30	13:40	Concepts & pathophysiology: The urologist point of view	David Castro-Diaz
13:40	13:55	Voiding dysfunction after delivery and pelvic surgery	Montserrat Espuña-Pons
13:55	14:10	Evaluation and diagnosis	Tufan Tarcan
14:10	14:20	Conservative management	Cristina Naranjo-Ortiz
14:20	14:40	Medical and surgical treatment	Christopher Chapple
14:40	14:55	Discussion	All
14:55	15:00	Take home messages	David Castro-Diaz

Aims of course/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. Etiology 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

After this workshop participants should be able to:

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

Learning Outcomes

After taking part in this workshop participants will be able to identify and properly manage urinary retention in women being able to identify possible aetiology, risk factors, evaluation and management including conservative, medical and surgical therapies. Typical clinical cases of typical clinical scenarios of urinary retention in women will be openly discussed with the attendants. Tree decision through Evidence Base Medicine tools will be used

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

This workshop will be interactive with no restrictions

Suggested Learning before workshop attendance

Urinary retention in women.

Curr Opin Urol. 2014 Jul; 24(4):375-9. doi: 10.1097/MOU.0000000000000071. Juma S1.

Suggested Reading

- 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.0000000000000071. Juma S1.
- Dysfunctional voiding. *Curr Opin Urol.* 2014 Jul; 24(4):330-5. doi: 10.1097/MOU.0000000000000074. 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.

David Castro-Diaz (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 (1). 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 (2).

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 gynecological surgery) and to abnormalities due to obstruction by pelvic organ prolapse, gynecologic tumors, 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 under-activity, acontractile bladder or failure of sphincteric 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, it has to be taken into account that there are rare cases reported, such as cytomegalovirus cystitis (3), eosinophilic cystitis (4), inflammatory nervous disease (5), incarcerated gravid retroverted uterus (6), which offer variable characteristics to this entity. In order 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 (7, 8).

References

1. Klarskov P, Andersen Jt, Asmussen cf, Brenoe J, Jensen SK, Jensen IL, et al. Acute urinary retention in women: A prospective study of 18 consecutive cases. *Scand J Urol nephrol.* 1987; 21:29–31.
2. Brucker BM, fong E, Shah S, rosenblum n, Kelly c, nitti VW. Urodynamic differences between dysfunctional voiding and primary bladder neck obstruction in women. *Urology* 2012.
3. Shih SL, Liu YP, tsai Jd, tsai YS, Yang fS, chen Yf. Acute urinary retention in a 7-year-old girl: an unusual complication of cytomegalovirus cystitis. *J Pediatr Surg.* 2008; 43:e37–9.
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7. Wein A, Barret d. Voiding function and dysfunction. *chicago Year Book Medical.* 1988. P.371.
8. Brucker BM, nitti VW. Evaluation of urinary retention in women: Pelvic floor dysfunction or primary bladder neck obstruction. *Current Bladder dysfunction reports.* 2012;7: 222-229

Montse Espuña-Pons (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, cesarean section, 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 postvoid residual volume (PVRV) detected by ultrasonography or by catheterization after spontaneous micturition, with a spontaneous recovery after several days.

The prevalence of acute symptomatic retention defined as inability to void after 6 hours of vaginal delivery or after removal a catheter after caesarean section is low. Nearly half of the women may have a PVRV > 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 five years survival (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 in order to 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. This women have LUT symptoms and need abdominal straining for void.

References

1. Mulder FE, Hakvoort RA, Shoffeimeer MA, Limpens J, Van der Post JAM, Roovers JP. Postpartum urinary retention a systematic review of adverse effects and management. *Int Urogynecol J* 2014; 25; 1605-1612.
2. 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. Bladder function after radical hysterectomy for cervical cancer. *Neurourol Urodyn*. 2015; 34:309-15
3. Espuña-Pons M, Cardozo L, Chapple C, Sievert KD, van Kerrebroeck P, Kirby MG. Overactive bladder symptoms and voiding dysfunction in neurologically normal women. *Neurourol Urodyn*. 2012; 31(4):422-8

Tufan Tarcan (Turkey)

Introduction:

There is no strong consensus on the evaluation of FUR since the pathophysiology is poorly understood. The etiology 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 (1-2). 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 favored including a urologist, physiotherapist, neurologist, gynecologist, 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 (1, 2). 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 (1, 2).

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 (1, 2). Renal function tests are needed in long term retention.

The evaluation should continue to find out the etiology 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 fecal 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 (2). 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 (2). There is a specific event that triggers UR 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. According to ICI in 2013, "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 infravesical obstruction which is however more difficult in women compared to men (1, 2). 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, tumors, vertebral congenital and acquired pathologies.

Concentric needle EMG of the external urethral sphincter is the test that diagnoses Fowler's syndrome described in 1985 (3). The EMG abnormality was called "decelerating bursts and complex repetitive discharges" where the exact pathophysiology remains unknown (3).

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.

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1. Heesakkers J, Van der Aa F, Tarcan T: Female stress urinary incontinence. In J. Heesakkers et al. (eds.), Practical Functional Urology. Springer International Publishing Switzerland, 2016. Chapter 5, pp: 89-118.
2. Çetinel B, Tarcan T: Management of complications after tension-free mid-urethral slings. Korean J Urol 2013; 54(10): 651-659.
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Cristina Naranjo-Ortiz (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 (1).

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 by definition always 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 an older population 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 men. In these cases, diagnosis is fairly straightforward, as patients will typically be 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 predictors.

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 avoid worsening (albeit temporary) because we do not want the patient to demoralize and abandon the treatment.

It could be last three months in order to return to normal bladder function.

The recommendations of expert committees and international organizations in matters related to continence, insist that the first approach in the conservative treatment for UI after prostate surgery remains the Physiotherapy with or without biofeedback, strengthening of PFM alone or with anal EES, etc. (2).

Other aids to these patients go through behavioural treatment, lifestyle changes and clean intermittent catheterization.

(1) Abrams, P., Blaivas, J. G., Stanton, S. L., & Andersen, J. T. (1988). The standardisation of terminology of lower urinary tract function. The International Continence Society Committee on Standardisation of Terminology. *Scand J Urol Nephrol Suppl*, 114, 5-19.

(2) Wilson, P. D., Berghmans, B., Hagen, S., Hay-Smith, E. J., & Moore, K. (2004). Adult conservative management. Paper presented at the 3rd International Consultation on Incontinence.

Christopher Chapple (United Kingdom)

Introduction:

Urinary retention in women can either result from failure of normal detrusor contractile function or as a 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. (1, 2)

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]

studies do not support the use of parasympathomimetics²

- Specifically when frequent and/or serious possible side effects are taken into account

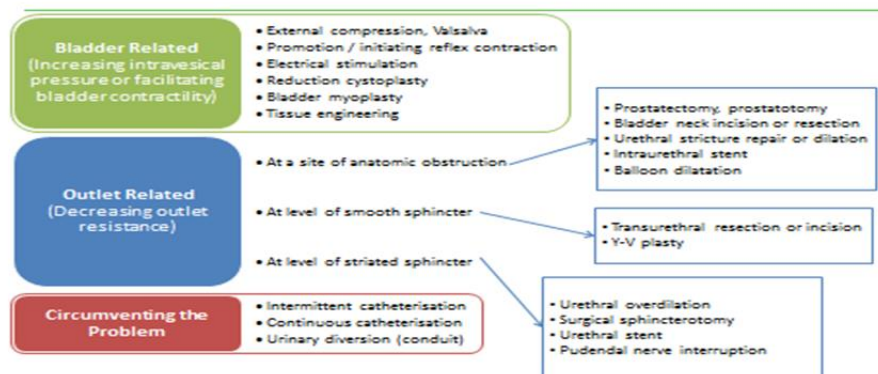
- Combination therapy with a cholinergic drug and an alpha-blocker appears to be more useful than monotherapy²

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

Surgical Intervention:-

Surgical intervention in patients with detrusor underactivity has a limited role. Permanent catheterisation either urethral or preferably suprapubic has inevitable complications such as discomfort, infection and stone formation and is best avoided. If possible intermittent self catheterization is the mainstay of therapy in many patients. A number of other therapies have been evaluated in highly selected patients. (3)

Interventions for DUA/UAB



Similar comments relating to catheterisation 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. (4, 5); although there is an evidence base to support its use in patients with Fowler's syndrome. (6, 7). Failing all other option either continent or incontinent urinary diversion may be necessary.

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Urinary retention in women: concepts and pathophysiology

D. Castro-Diaz

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Spain

Acute 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

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

Bladder dysfunction

-Detrusor underactivity

Neuropathic

- Lower motor neurons
- Decentralizations

Myogenic

- Chronic obstruction or overdistention
- Diabetes mellitus

Pharmacologic

- Anticholinergics
- α -agonists
- Narcotics

Agina

-Acontractile bladder

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

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 %. (Petri 2005)
- Tape too tight or bad contractility
- Cochrane Data base TVT 5.9% TOT 2.8% (Ogah J 2009)
- Diagnosed by hypersuspension
- Swann sign at MCU; curve at bladder neck
- Prolonged voiding with low Qmax < 15 cm H₂O & Pdet (> 25 cm H₂O) & PVR
- OAB complaints

Urethral stricture in women

3-8 % of women who present to urologist with voiding complaints have BOO (Carr1996)

The incidence of urethral stricture in women with BOO varies from 4% to 13% (Nitti 1999, Groutz 2000, Kuo 2005)

Female urethral stricture is typically iatrogenic

Aetiology of urethral stricture in women

Rare entity
 Controversial aetiology
 Likely that most cases are iatrogenic or traumatic in nature

- 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

Background of 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

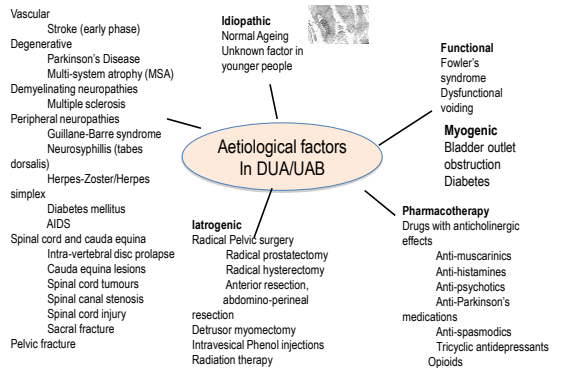
Abnormal electromyographic activity of the urethral sphincter, voiding dysfunction, and polycystic ovaries: A new syndrome?

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
- Apparently unconnected precipitating event
- All investigations normal, including MRI
- Not taking drugs, particularly opiate

Neurogenic injury/disease



VOIDING DYSFUNCTION AFTER DELIVERY AND RADICAL PELVIC SURGERY

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Associated Professor, University of Barcelona,
Barcelona, Spain

Introduction

•Urinary retention (UR) in postpartum or after gynaecological radical pelvic surgery can be only a **transient problem** or may be the **aetiology of a persistent voiding dysfunction.**

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.**

Acute postpartum urinary retention (APUR) can be a serious complication after childbirth, which can cause urogenital tract morbidity.

Postpartum urinary retention (PUR)

Two clinical situations may be observed:

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.

**Nearly half of the women may have a PVRV > 150 ml. after the first spontaneous void in immediate postpartum.*

Postpartum urinary retention (PUR)

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

F. E. M. Mulder · R. A. Hakvoort · M. A. Schoffeleers · J. J. Limpens · J. A. M. Van der Post · J. P. W. R. Roovers

- No sufficiently powered and properly designed studies.
- Future research needs to include control groups and focus on long-term adverse effects.

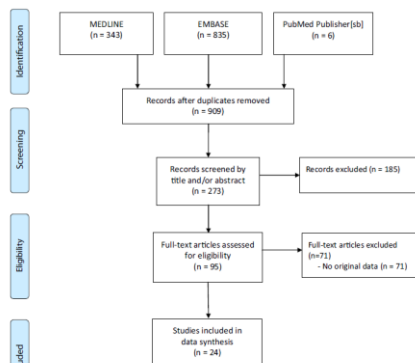


Table 2 Treatment and recovery for overt PUR

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-Chang et al. [6]	3.97	CIC followed by CAD	98 %<72 h	10 days
Fadokow et al. [33]	0.34	CIC and CAD (not specified)	NA	NA
Foom et al. [28]	2.50	CAD	NA	NA
Glavind and Bjork [5]	0.70	CIC	47 %<24; 33 %<48 h; 20 % self-catheterisation	21 days
Kokze et al. [4]	0.30	CAD	100 %<48 h	N/A
Liang et al. [7]	7.40	CIC followed by CAD	65 % 1x CIC; 23 % 2x CIC; 1 % CAD	48 h
Liang et al. [29]	12.0	CIC followed by CAD	83 %<24 h; 11 %<48 h; 5 %<72 h	At hospital discharge
Musshwhite et al. [35]	4.70	NA	NA	NA
Obofson et al. [27]	0.89	CAD	27 %<72 h; 53 %<14 days	> 14 days
Rievi et al. [8]	0.14	CAD	Median time: 72 h	148 h
Tso et al. [32]	0.20	CIC and CAD (not specified)	Median time: 19 days	85 days
Yip et al. [11]	4.90	CAD	NA	NA
Lee [30]	8.0	CIC followed by CAD	NA	NA
Sherline and Danforth [31]	3.0	CAD	Median time: 52 h	96 h

N/A no data available

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

Reference	Time	Prevalence PUR (%)	Natural course covert PUR
Ramsay and Torbet [45]	Mean 72 h	0.4	NA
Andolf 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
Kokze 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	3.6	Measurements not repeated
Imail and Emery [44]	48 h	37	Measurements not repeated
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

N/A no data available

Postpartum urinary retention (PUR)

Possible risk factors for PUR are:

- *Episiotomy and large perineal tears, birth weight, primiparity, etc*
- *Epidural analgesia, opioid analgesia,*

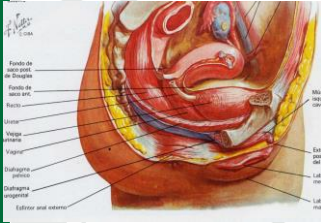


Postpartum urinary retention (PUR)

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

Obviously, vaginal delivery is an anatomically and functionally traumatic event as it not only influences the anatomy and pelvic floor muscles [24] but also has effects on pudendal nerve conduction [25, 26] and possibly causes obstructive perineurinal and vulval oedema. Our results showed that episiotomies, epidural analgesia and birth weight independently influence postpartum bladder function negatively. The (sutured) episiotomy as a predictor is likely to exert its effect through the development of pain and subsequent disturbance in bladder sensitivity and also central inhibition of bladder function [27–29].

Postpartum urinary retention (PUR)



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

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Postpartum urinary retention (PUR)

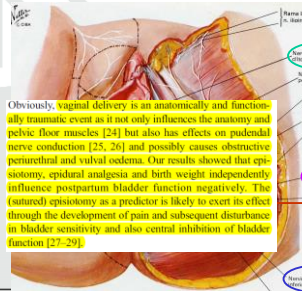
- After a vaginal delivery, important changes in the anatomy and functionality of the pelvic floor may occur and as a consequence, urinary tract obstructive causes (periurethral edema)



Effect through development of pain.

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Postpartum urinary retention (PUR)

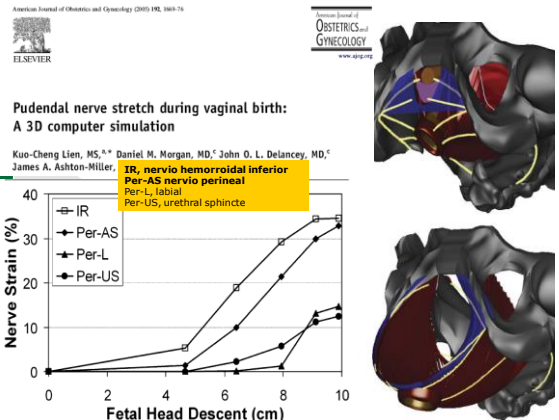


Effects on pudendal nerve conduction

Obviously, vaginal delivery is an anatomically and functionally traumatic event as it not only influences the anatomy and pelvic floor muscles [24] but also has effects on pudendal nerve conduction [25, 26] and possibly causes obstructive periurethral and vulval oedema. Our results showed that episiotomy, epidural analgesia and birth weight independently influence postpartum bladder function negatively. The (unaided) episiotomy as a predictor is likely to exert its effect through the development of pain and subsequent disturbance in bladder sensitivity and also central inhibition of bladder function [27-29].



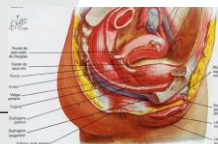
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Postpartum urinary retention (PUR)



- Epidural analgesia directly affects bladder sensitivity and contractility.



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Postpartum urinary retention (PUR)

Diagnosis

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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. Hakvoort² · Jan-Paul W. R. Roovers¹

Number of patients

Definition?

Table 1 Baseline characteristics of the 745 included women

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)
Epidural analgesia, n (%)	141 (19)
Opioid analgesia, n (%)	121 (16)
Episiotomy, n (%)	131 (18)



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Definition?

The first voided volume was not measured routinely and not when the first void took place during showering, and thus was measured in 439 of the 745 women. In these 439 women the median first voided volume was 320 mL (range of 30–1,900 mL). The median PVRV was 140 mL (0–1,000 mL), and the 75th and 95th percentiles were 250 mL and 540 mL, respectively (Fig. 1). For ease of interpretation and use in practice the values used in the regression model were median 150 mL (value often used in previous studies), 75th percentile 250 mL and 95th percentile 500 mL as outcomes. Of the 745



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Results Of 745 included women, 347 (47 %) were diagnosed with covert PUR (PVRV ≥ 150 mL), of whom 197 (26 %) had a PVRV ≥ 250 mL (75th percentile) and 50 (7 %) a PVRV ≥ 500 mL (95th percentile). In multivariate regression analysis, episiotomy (OR 1.7, 95 % CI 1.02–2.71), epidural analgesia (OR 2.08, 95 % CI 1.36–3.19) and birth weight (OR 1.03, 95 % CI 1.01–1.06) were independent risk factors for covert PUR. Opioid analgesia during labour (OR 3.19, 95 % CI 1.46–6.98), epidural analgesia (OR 3.54, 95 % CI



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

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PUR. Opioid analgesia during labour (OR 3.19, 95 % CI 1.46–6.98), epidural analgesia (OR 3.54, 95 % CI 1.64–7.64) and episiotomy (OR 3.72, 95 % CI 1.71–8.08) were risk factors for PVRV ≥ 500 mL.



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. Hakvoort² · Jan-Paul W. R. Roovers¹

PUR. Opioid analgesia during labour (OR 3.19, 95 % CI 1.46–6.98), epidural analgesia (OR 3.54, 95 % CI 1.64–7.64) and episiotomy (OR 3.72, 95 % CI 1.71–8.08) were risk factors for PVRV ≥ 500 mL.



Table 2 Univariable regression analysis

Clinical factor	Number of women	PVRV ≥ 150 mL		PVRV ≥ 250 mL		PVRV ≥ 500 mL	
		OR	95 % CI	OR	95 % CI	OR	95 % CI
Maternal age (per year)	745	1.01	0.99–1.04	1.03	0.98–1.03	1.03	0.97–1.08
BMI (per kg/m ²)	425	0.99	0.96–1.01	0.98	0.95–1.01	1.00	0.95–1.05
Primiparous (yes/no)	745	1.63	1.22–2.18	1.46	1.05–2.03	2.56	1.39–4.73
Duration of labour (per minute)	724	1.00	1.00–1.00	1.00	1.00–1.00	1.00	1.00–1.00
Duration of second stage (per minute)	738	1.01	1.01–1.02	1.01	1.01–1.02	1.01	1.00–1.02
Augmentation (yes/no)	745	1.30	0.97–1.73	1.20	0.87–1.67	1.17	0.65–2.08
Opioid analgesia (yes/no)	745	1.39	0.93–2.08	2.04	1.32–3.14	3.59	1.72–7.50
Epidural (yes/no)	745	2.57	1.75–3.77	2.08	1.41–3.06	2.88	1.57–5.26
Instrumental delivery (yes/no)	745	2.49	1.58–3.92	1.89	1.20–2.97	3.34	1.75–6.41
Birth weight (per 100 g)	744	1.04	1.01–1.06	1.05	1.02–1.07	1.03	0.99–1.08
Vaginal tears (yes/no)	745	1.58	1.17–2.14	1.46	1.03–2.07	3.26	1.50–7.04
Episiotomy (yes/no)	745	2.39	1.61–3.53	2.83	1.91–4.19	5.07	2.81–9.17



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. Hakvoort² · Jan-Paul W. R. Roovers¹

Conclusions Episiotomy, epidural analgesia and birth weight are risk factors for covert PUR. **We suggest that the current cut-off values for covert PUR should be reevaluated when data on the clinical consequences of abnormal PVRV become available.**

Postpartum urinary retention (PUR)

Treatment

Acute postpartum urinary retention (APUR).

- The main treatment it's **clean intermittent self-catheterization (CISC)** taught by the specialized nurse.
- Patients followed up by telephone and appointments with **uroflowmetry**.

Postpartum urinary retention (PUR)

Treatment

Women **with abnormal postvoid residual volume (PVRV)**

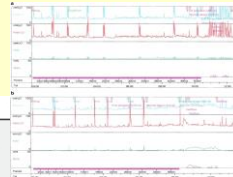
- Post-void residual urine volume (**PVRV**) **measured by US**
- If it persists or increases, the patients are instructed to perform clean intermittent **self-catheterization**.
- Control in our unit : PVRV was measured every 3-5 days until the first 2 weeks , then weekly.

Most patients normalized PVR between one –two weeks

Postpartum urinary retention (PUR)

Treatment

- If retention persists, **multichannel urodynamics is performed**.
- Multichannel urodynamics confirmed in most patients an **acocontractile detrusor** and in a few cases associated with stress urinary incontinence.



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. Hakvoort² · Jan-Paul W. R. Roovers¹

Postpartum urinary retention (PUR)

CONCLUSIONS

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

Postpartum urinary retention (PUR)

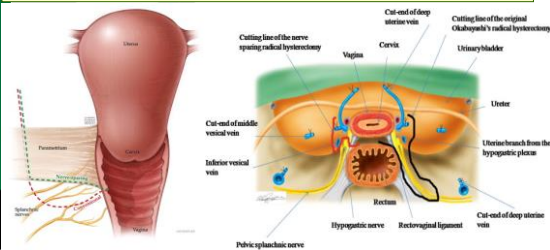
CONCLUSIONS

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

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 LUT dysfunction



Impact of the radical surgery for cervical cancer on bladder function

Women after RH had significantly more :

- voiding dysfunction
- urinary incontinence

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

LOW URINARY TRACT SYMPTOMS AND URODYNAMIC OBSERVATIONS

VOIDING DYSFUNCTION

Early postoperative voiding dysfunction

- 15 % of patients after RH require urethral catheterization for more than 30 days.
- Manchana et al (2009)

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EJSO 32 (2006) 445–449

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.*
- **Follow-up 5 years after the operation**

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

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Urogynaecological dysfunction after radical hysterectomy

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SYMPTOMS OF DIFFICULT VOIDING AFTER SURGERY

- 123 /333 (36%)

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

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Early postoperative voiding dysfunction

ORIGINAL ARTICLE Only 4 % > 30 days

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

Jaume Pahisa, PhD, Sergio Martínez-Román, PhD, Aureli Torné, PhD, Pere Fusé, MD, Inmaculada Alonso, PhD, Jose Antonio Lejárruegui, PhD, and Joan Balasch, PhD

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

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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 matched to a random female population sample aged 20 to 70 years (reference group).

Prevalence of 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

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Prevalence of LUTS

Table 2
 Prevalence of pelvic floor symptoms in CCS per treatment group (in %) and odds ratios (95% confidence interval) compared to their matched references.

UDI items	RH and LND (N=146)			SART (N=49)			PRT (N=47)		
	%	OR	(95%CI)	%	OR	(95% CI)	%	OR	(95% CI)
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)
Difficult to empty bladder	45	6.2	(3.4-11.3)	45	7.2	(2.4-21.2)	30	4.7	(1.4-15.2)
Incomplete emptying	51	3.2	(2.0-5.3)	45	2.5	(1.1-5.9)	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)

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

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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 :

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

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 :

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

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



Distressing LUTS

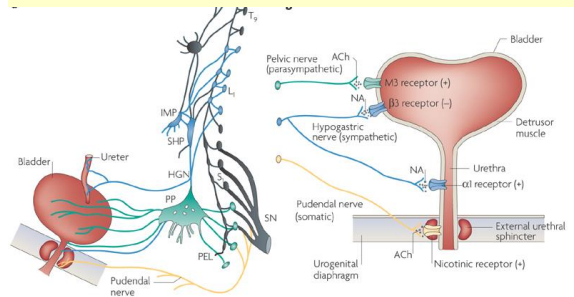
Table 3 Proportions (%) of CCS with distressing pelvic floor symptoms (i.e., scoring above 90th percentile of domain scores of reference group) and odds ratios (95% CI) of every treatment group compared to their matched references

LUTS domains	RH and LND (N=145)			SART (N=49)			PRT (N=47)		
	%	OR	(95% CI)	%	OR	(95% CI)	%	OR	(95% CI)
Urinary incontinence	24	3.5	(1.8-7.1)	29	4.5	(1.4-14.9)	30	6.1	(1.6-22.9)
Overactive Bladder	6	0.6	(0.2-1.4)	18	3.5	(0.9-14.0)	47	7.2	(2.4-21.5)
Obstructive voiding	36	5.3	(2.8-10.2)	35	4.7	(1.6-14.0)	28	5.8	(1.5-21.9)
Pain (bladder/pelvis)	15	4.9	(1.8-13.3)	6	0.7	(0.2-3.5)	26	3.7	(1.1-12.4)

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



Decreased detrusor muscle contraction is common urodynamic observation after radical hysterectomy



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

science

Int Urogynecol J (2010) 21:95–101
DOI 10.1007/s00192-009-0996-5

ORIGINAL ARTICLE

Long-term lower urinary tract dysfunction after radical hysterectomy in patients with early postoperative voiding dysfunction

Tarinee Manchana · Chalisa Prasartsakulchai · Apirak Santingamkun

**Before : 3/25 (12%)
After : 14/30 (47%)**

Thirty patients at least **2 years** after radical hysterectomy were evaluated with **multichannel urodynamic studies.**



Int Urogynecol J (2010) 21:95–101
DOI 10.1007/s00192-009-0996-5

ORIGINAL ARTICLE

Long-term lower urinary tract dysfunction after radical hysterectomy in patients with early postoperative voiding dysfunction

Tarinee Manchana · Chalisa Prasartsakulchai · Apirak Santingamkun

Urethral catheterization > 30 days

To **compare long-term** lower urinary tract dysfunction after radical hysterectomy in patients:

- (A) with **early postoperative voiding dysfunction.**
- (B) without **early postoperative voiding dysfunction.**



URODYNAMIC OBSERVATIONS

DECREASED DETRUSOR PRESSURE

- **Detrusor pressure** at maximum flow significantly **decreased** in patients **after surgery**, but *without a difference between groups A and B.*

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

Bladder Function After Radical Hysterectomy for Cervical Cancer

Rosa M. Laterza,^{1*} Karl-Dietrich Sievert,² Dirk de Ridder,³ Mark E. Vierhout,⁴ Francois Haab,⁵ Linda Cardozo,⁶ Philip van Kerrebroeck,⁷ Francisco Cruz,⁸ Con Kelleher,⁹ Christopher Chapple,¹⁰ Montserrat Espuna-Pons,¹¹ and Heinz Koelbl¹

Nerve-sparing techniques appear to improve bladder function without compromising overall survival. Studies comparing the effects of nerve-sparing radical hysterectomy with standard surgery yielded encouraging results in respect of postoperative lower urinary tract function. Clinical trials with a long period of follow-up are required for better comprehension of the complex pathophysiology of bladder dysfunction after radical hysterectomy. *NeuroUrol. Urodynam.* 34:309–315, 2015. © 2014 Wiley Periodicals, Inc.

Impact of the radical surgery for cervical cancer on bladder function

CONCLUSIONS:

- LUTS and urodynamic dysfunctions are common after radical surgery for cervical cancer.
- There is a need for improving the information to the patient before and after radical hysterectomy.
- Special attention **for patients who are at high risk** of later urogynaecological problems.

Impact of the radical surgery for cervical cancer on bladder function

CONCLUSIONS:

- **Assessment in the pre and posttreatment is important** for detect *distressing symptoms*, which will likely enhance patients' quality of life
- Pre- and post-operatively, patients must get information about **how reducing risks of LUTS** (*losing weight, emptying the bladder appropriately, and exercising the pelvic floor muscles*).



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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- Self-funded
- Institution (non-industry) funded
- Sponsored by: *Allergan*



Female Urinary Retention (FUR):



Evaluation and Diagnosis

Tufan Tarcan, MD, PhD

Professor of Urology
Marmara University School of Medicine
Istanbul, Turkey

W26, ICS, September 16, 2016, Tokyo

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:
 - Transient causes or,
 - Detrusor underactivity or,
 - Increased outlet resistance
 - 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

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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

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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.



British Journal of Medical & Surgical Urology

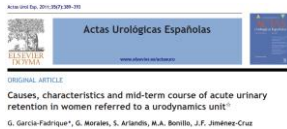
Aetiology and management of acute female urinary retention

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

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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.



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Basic steps of evaluation (1)

Detailed history

- 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

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The type of onset and age

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

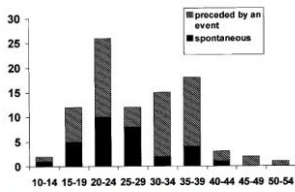


FIG. 2. Age distribution of women at initial complete urinary retention episode and role of specific events related to onset.

THE CAUSE AND NATURAL HISTORY OF ISOLATED URINARY RETENTION IN YOUNG WOMEN
MICHAEL J. SWINN, OLIVER J. WEISMAN, ETHINE LOWE and CLARE J. FOWLER

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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)

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

Special Tests for the Dx of NBD



Bladder-cooling reflex; the ice water test

- show value in the diagnosis of NLUTD and in the differentiation between reflexic and areflexic neurologic bladder (LOE 2, ICI 2013).

Bethanechol supersensitivity test

- may contribute to overall evaluation of neurologic LUT dysfunction. (LOE 2, ICI 2013)

Sphincter EMG

- can be valuable in the diagnosis of patients with neurologic bladder dysfunction (LOE 2, ICI 2013).

Others: Nerve conduction studies, SSEP

- Recommendation of grade C, ICI 2013

Concentric needle EMG of the external urethral sphincter



The test that diagnoses Fowler's syndrome (1985)

The EMG abnormality was called "decelerating bursts and complex repetitive discharges"

- a muscle membrane disorder,
- primary disorder of sphincter relaxation

Increased urethral afferent activity that inhibits the passage of bladder afferent signals to the brain

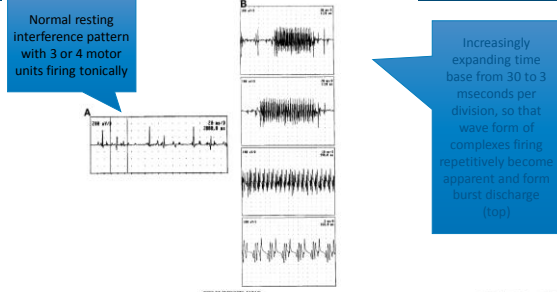
- poor sensation, large bladder capacity and DUA

0002-2296(1985)03:0121
The Journal of Urology
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Printed in U.S.A.

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

MICHAEL J. SWINN, OLIVER J. WISEMAN, KATHINE LOWE and CLARE J. FOWLER
From the Department of Uro-Neurology, National Hospital for Neurology and Neurosurgery, London, United Kingdom

Concentric needle EMG of the external urethral sphincter



THE CAUSE AND NATURAL HISTORY OF ISOLATED URINARY RETENTION IN YOUNG WOMEN
MICHAEL J. SWINN, OLIVER J. WEISMAN, EITHNE LOUW and CLARE J. FOWLER

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

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 complex

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

High-level of comorbidities in Fowler's syndrome is intriguing

Of 62 patients with Fowler's syndrome, 50% had unexplained chronic pain syndromes,

- 19% of these were taking opiates.

Abdominopelvic surgery with general anesthesia was the leading trigger (35%).

24% had "functional" neurological symptoms such as non-epileptic attacks or leg weakness.

30% had psychological symptoms

Fowler's Syndrome of Urinary Retention: A Retrospective Study of Co-Morbidity
Ingrid Heimbauer, Ian Stone, Clare Fenwick, Inga Elinor Cohen, Alan Casson, and Sarah Partridge

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

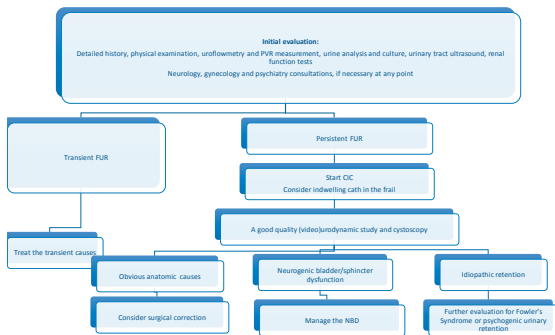
EAU European Association of Urology

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^a, Frans Bruyninckx^b

An algorithm for the evaluation of FUR



Conclusions

The multi-factorial etiology of FUR is complicated and poorly understood.

A considerable amount of pts with FUR have transient causes that can be diagnosed or treated by or during a structured clinical evaluation.

CIC with elimination of transient causes will be enough to cure half of the patients.

Conclusions



A good quality (video) UDS and cystoscopy should be considered in persistent FUR

A multidisciplinary teamwork is favored:

- Urologist
- Physiotherapist
- Neurologist
- Gynecologist
- Psychiatrist
- Gastroenterologist/general surgeon

Do not.....



Do not perform excessive urethral dilatation

- Most common cause of female urethral stenosis is iatrogenic
 - The most common urodynamic finding in FUR is detrusor under-activity

Do not label idiopathic cases as psychogenic without completing the psychiatric and neurological work up



Thank you

Urinary retention in women Conservative management

C. Naranjo-Ortiz, PT, PhD

Affiliations to disclose[†]:

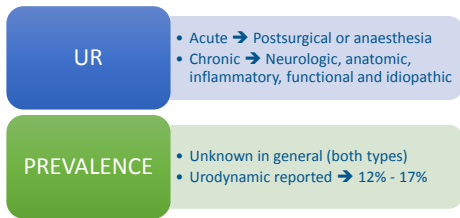
ICS TRUSTEE

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

Funding for speaker to attend:

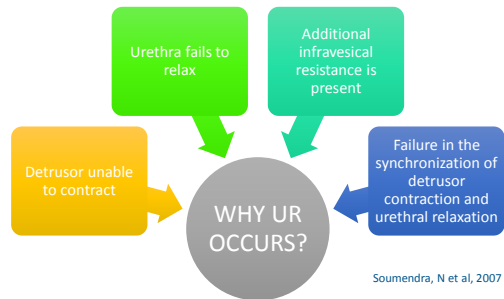
- Self-funded
- Institution (non-industry) funded
- Sponsored by:

Urinary Retention (UR) in women Prevalence and etiology



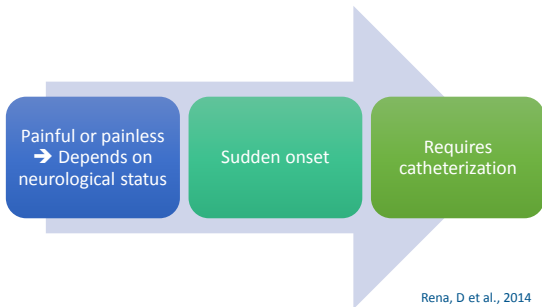
Wennber, Al et al., 2009

UR in women



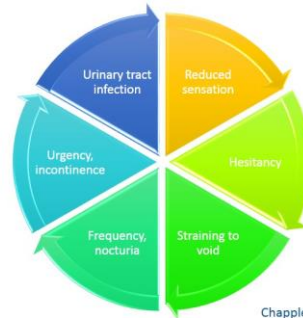
Soumendra, N et al., 2007

Acute UR in women



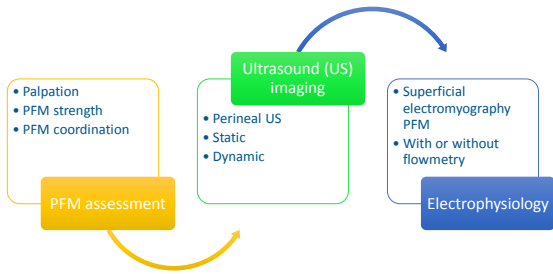
Rena, D et al., 2014

Chronic UR in women



Chapple, CR et al., 2008

Clinical evaluation of the Pelvic Floor Muscles (PFM) 

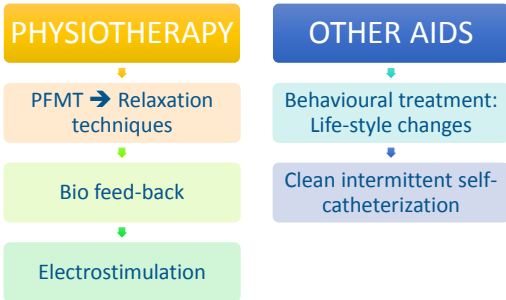


Chronic UR in women
Conservative management 

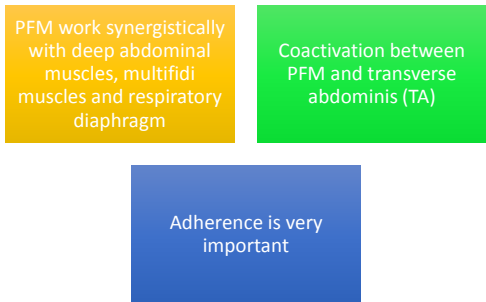


Hsieh, J. et al., 2014

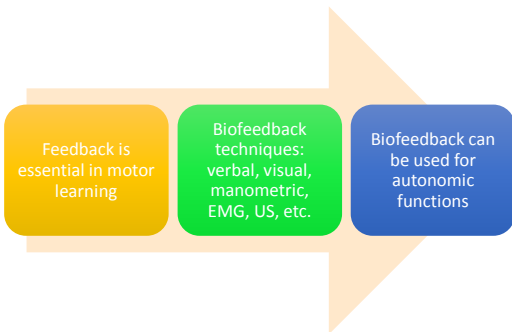
Chronic UR in women
Conservative management 



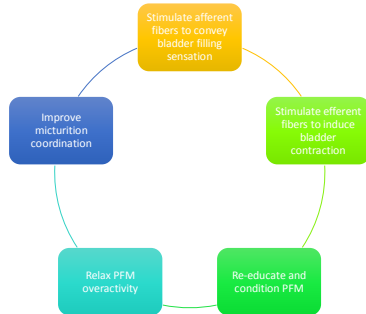
PFMT – Relaxation techniques 



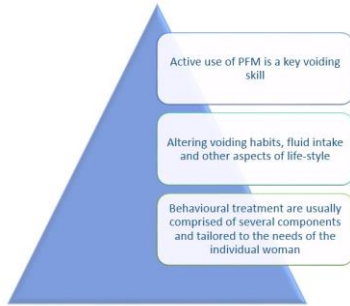
Feedback and biofeedback 



Electrical Stimulation 

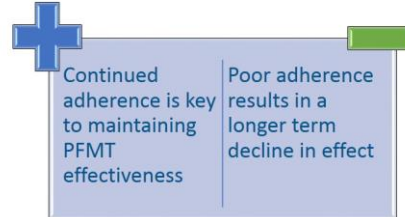


Behavioural treatment: Life-style changes



Vahr, S et al., 2013

ADHERENCE



Dumoulin, C et al., 2015



TAKE HOME MESSAGES

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

Patient-focused strategies targeting different PFMT strategies:

- influencing the intention to adhere,
- self-efficacy,
- positive attitude towards exercises,
- perceived benefits,
- integration of PFMT into daily activities.

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



DOMO ARIGATO GOZAIMASU

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Faculty of Health Science

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Management of Female Urinary Retention - Medical and Surgical

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UK



ICIS 2016 TOKYO

Christopher Chapple

Affiliations to disclose[†]:

Allergan: Scientific Study/Trial (Researcher/Author), Meeting Participant/Lecturer, Consultant/Advisor
 Astellas: Grant, Scientific Study/Trial (Researcher/Author), Meeting Participant/Lecturer, Consultant/Advisor
 Boston: Meeting Participant/Lecturer
 Medtronic: Consultant/Advisor
 Pfizer: Consultant/Advisor
 Recordati: Scientific Study/Trial (Researcher/Author), Consultant/Advisor

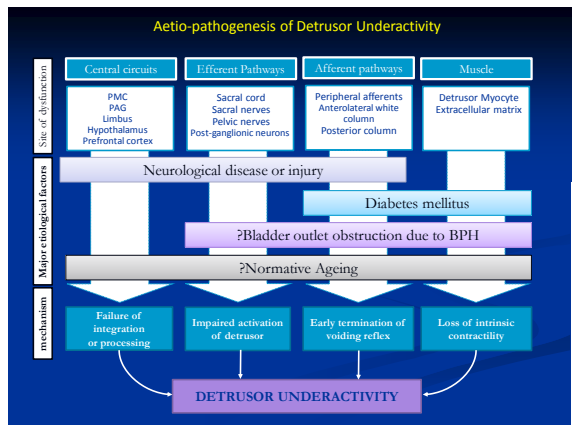
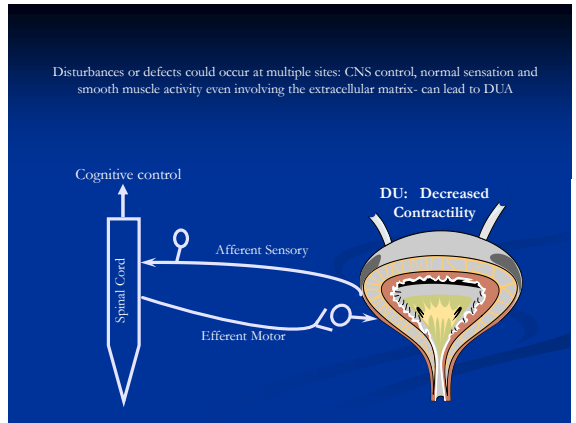
[†] All financial ties (over the last year) that you may have with any business organisation with respect to the subjects mentioned during your presentation

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- Sponsored by: *Astellas*

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



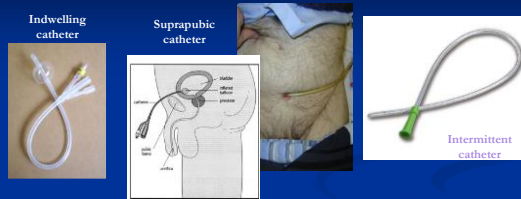
Physiological Measures

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 BDD	1 Lengthy and complex calculation 2 No validated thresholds 3 Does not measure sustainability of contraction
			$WF = [(pdet + a) (vdet + b) - ab] / 2r$
			Projected isovolumetric pressure (P _{iso}): $Pdet @ Qmax + 5 Qmax$ Bladder Contractility Index (BCI) (strong >150, normal 100-150 and weak <100)
Indices	Detrusor shortening velocity Detrusor contraction Coefficient (DCCO) Bladder contractility index (BCI)	1 Easy to use 2 Simultaneous easy to obtain 3 Utilisation 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 BDD and BCI
			PdetIso
			$vdet = Q/2[3/(V + V_0)/4n]^{0.66}$
Occlusion testing	Voluntary stop test Mechanical stop test Continuous occlusion	1 Real time indication of isovolumetric contraction strength 2 No calculations	1 Inconvenient/painful for patients 2 Unreliable 3 No information on sustainability of contraction in (continuous occlusion) 4 May underestimate isovolumetric pressure (stop test) 5 Unreliable in some patient groups
Ranges of hydrodynamic 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 BDD and BCI

Conservative management

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

Catheterisation



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. Barndollar BJ. J Urol 2007;99:749-52. 2. Yamashita Da J Urol 2004;171:88-96.

Electrical stimulation

Intravesical stimulation (IVES)

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 ± 183.9 to 109.2 ± 181.3 mL)
 - mean number of catheterisations (5.3 ± 2.8 to 1.9 ± 2.8)

Effective, but invasive

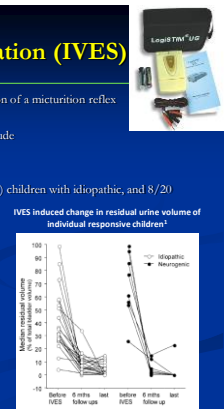
* Used for idiopathic urinary retention

1. Brindley J Physiol 1974;237:101-103. 2. Van Kerrebroek J Urol 2007;176:2029-34. Figure from: Cassin P, Hoang R, 2006;132:163-64. SCI, spinal cord injury

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 detrusor¹

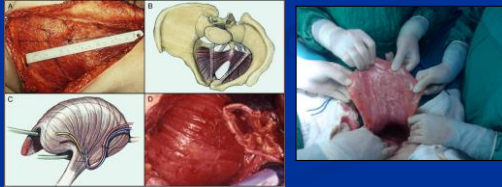
- 10 daily 60 min sessions (5 b.i.d 20 min sessions in 22 pts) followed by home treatment (2-3 times weekly) until bladder function normalised/no further improvement
- In responsive children (at 6 months):
 - median residual volume decreased (75 mL (range 6-419) to 22 mL (range 0-338); p<0.0001)
 - median 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



1. Galati Norman J Urol 2003;252:311-42.

Surgical options

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



Future directions

1. Underactive bladder

- prospective study correlating symptoms and signs with DUA
- Development of patient-reported outcome measure

2. Detrusor underactivity

- Consensus and validation of urodynamic diagnostic criteria
- Development of non-invasive methods of **new pharmacological therapy?**

Causes of female Retention

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

Conservative Treatment Options

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

Definitive Treatment Options

Midurethral Synthetic Sling

- Sling incision
- Sling loosening (early)
- Urethrolysis

Traditional Slings

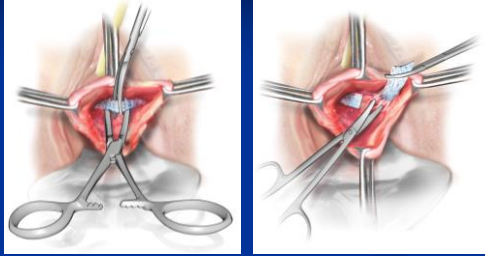
- Sling Incision (PV sling)
- Urethrolysis
 - Transvaginal
 - Retropubic
 - Supraperineal (infrapubic)
- Cut suspension/sling sutures
 - *No published peer-reviewed series*

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 Nititis personal communication

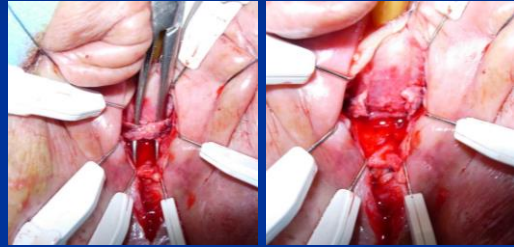
Midurethral Synthetic Sling Incision



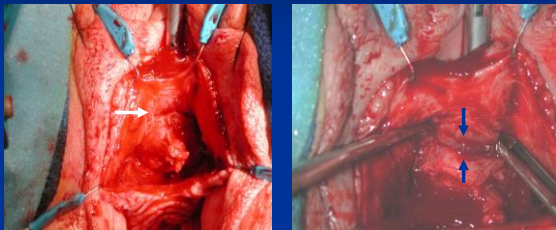
- If the sling is difficult to identify, can go lateral to the midline especially for TO slings
- It is critical to identify the sling with certainty (consider pathologic confirmation)

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%
26% 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

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

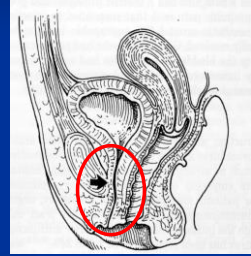
1. Nitti VW, et al. Urology 2002;59:47-52.
2. Amundsen CL, et al. J Urol 2000;164:434-7.
3. Goldman HB. 2003;62:714-8

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

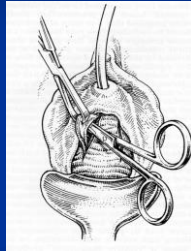
Urethrolisis - Anatomy

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



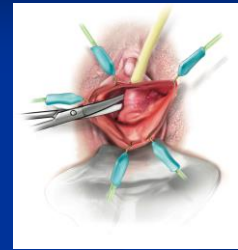
Transvaginal Urethrolisis

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



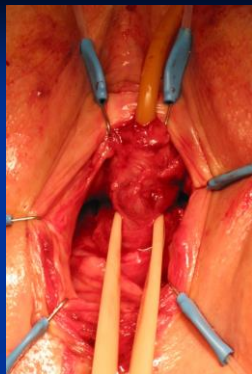
Transvaginal Urethrolisis

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

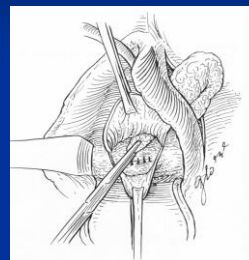


Illustrations from Vaginal Surgery for The Urologist
Nitti VW, Rosenblum N, Brucker BM Elsevier, 2012

- Place penrose drain around the urethra

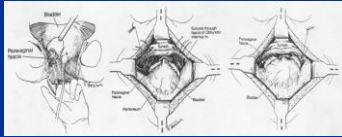


Transvaginal Urethrolisis Optional - Interposition of Martius Flap



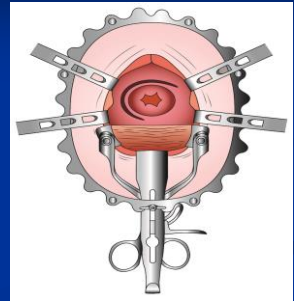
Retropubic Urethrolysis

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



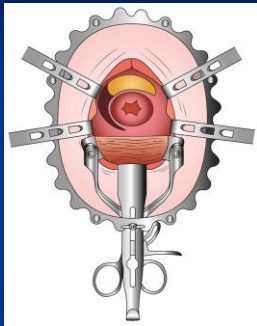
Suprameatal Urethrolysis

- Curved incision above the urethra



Suprameatal Urethrolysis

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



Urethrolysis Results

	N	Type	Success	SUI
Foster & 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 Urethrolysis

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

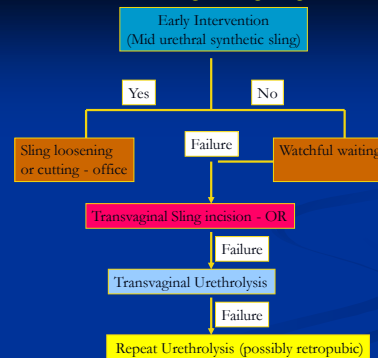
Urgency Incontinence

- 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 urethrolysis, by a variety of techniques, are successful in restoring emptying and relieving LUTS in a majority of cases
 - Some studies “suggest early rather than late is better”
- The diagnosis is most often made based on clinical grounds rather than testing

Causes of female Retention

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

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

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 37 women with urinary retention. Abnormal electromyographic activity was found in 33. Ultrasonography of the ovaries in 22 of the 33 women showed that 14 had polycystic ovaries. Of the other eight women, two had had oophorectomies, one had abnormal 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 12 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 urinary 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 slipshod 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 area and numerous (>10) peripherally located cysts of 4–6 mm in diameter. When associated with hirsutism, gray skin, obesity, menstrual irregularity, and infertility the polycystic ovary syndrome may be the diagnosis. This condition is associated with increased concentrations of circulating androgen and luteinising hormone (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.

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,¹⁰ and abnormal electromyographic activity—that is, decelerating bursts and complex repetitive discharges—was found in 33. Pelvic ultrasonography was carried out in 22 of the 33 women (the other 11, 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 3 MHz long focused transducer attached to an Aloka 120 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

Long term outcome of SNS

- 5 year data from 17 centres; 31 patients
- ISC fell from 5.3 (+/- 2.8) to 1.9 (+/- 2.8)
 - Reduced mean catheterised volume
- At 5 years clinical success rate 58% (at least 50% reduction in symptoms)
 - 78% of people responding at 1 year were still responding at 5 years

Van Kerrebroeck et al. J Urol 2007; 178: 2029

PRIZE AWARD: Best Clinical Abstract (Joint Prize)

213

Kavva R¹, DesGupta R¹, Critchley H², Fowler C¹, Griffiths D³¹. 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 void. 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.

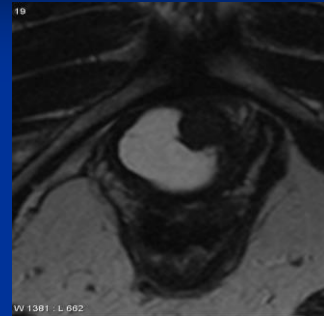
EMG-negative Fowler's syndrome

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

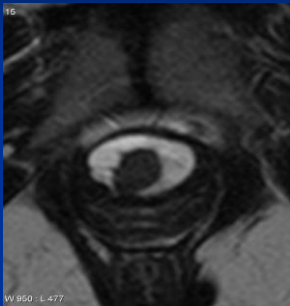
Causes of female Retention

- | | |
|--------------------------------------|----------------------------|
| ■ 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

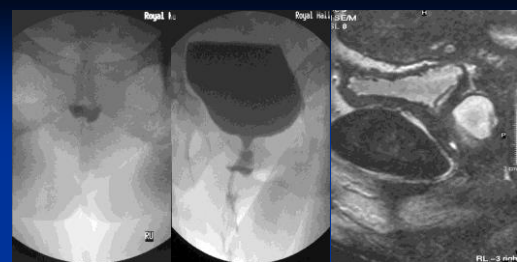
- How large is it?
 - Is it asymptomatic?
- Only treat if symptomatic
- Physical examination
 - ? Cystocele
 - ? Stress incontinence
 - ? Need for urodynamics
 - Is there infection present?
 - MSU

Female urethral diverticula Treatment

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

Excisional Surgery -tips

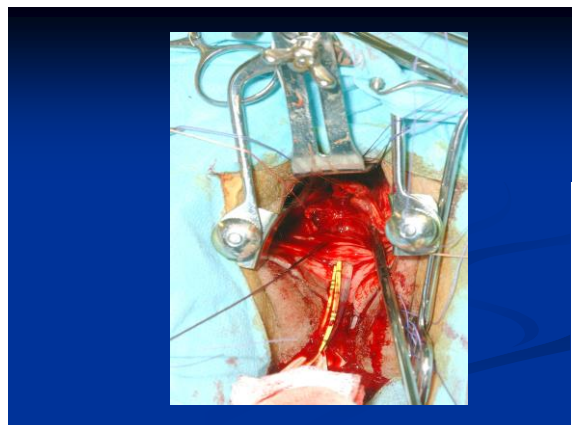
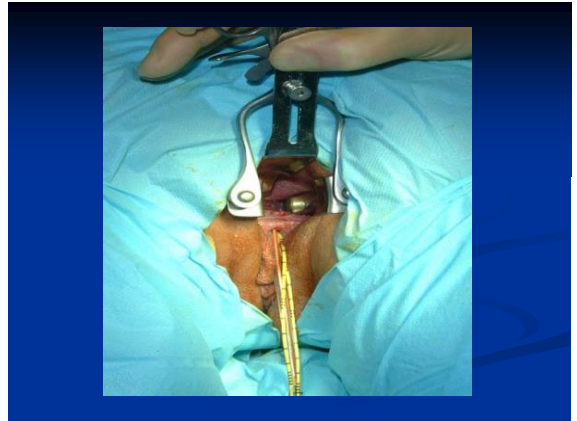
- Sim's Position rather than standard lithotomy
- Self retaining retractor –eg Parkes
- Good light
- Suction
- Infiltrate with fluid (adrenaline)

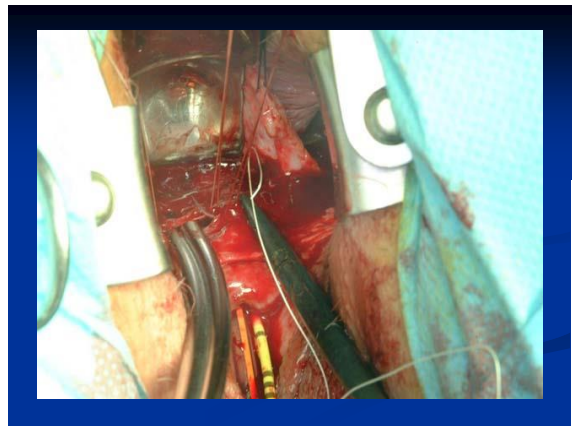
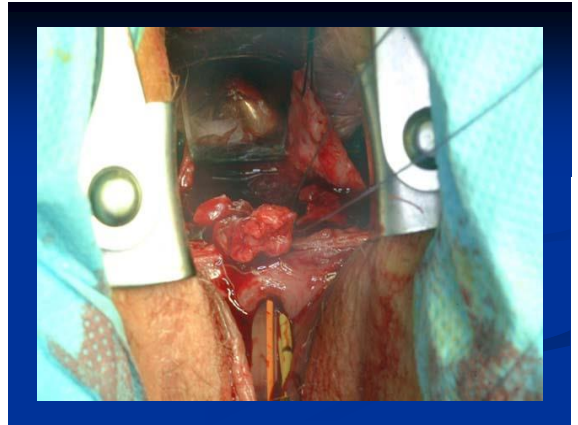
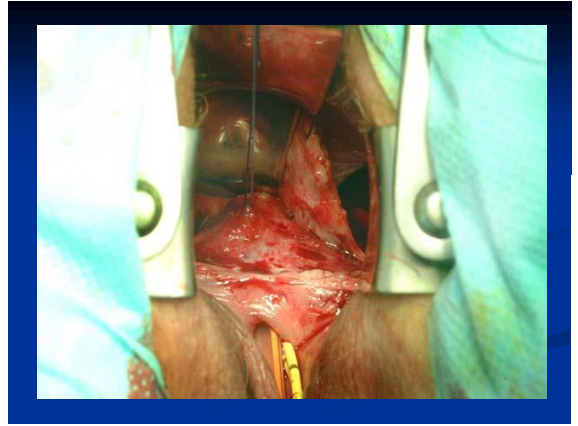
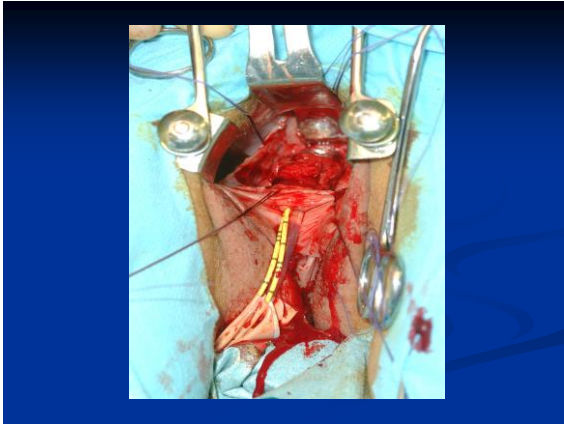


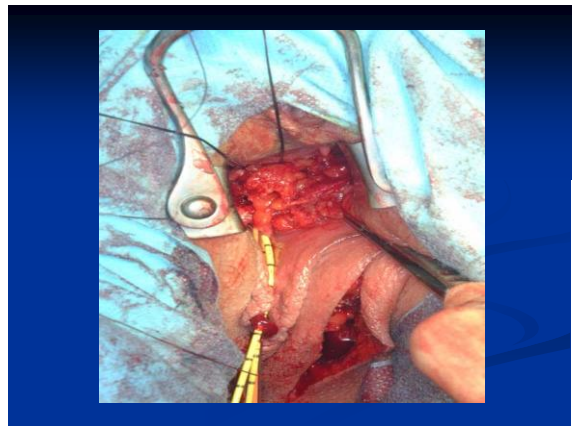
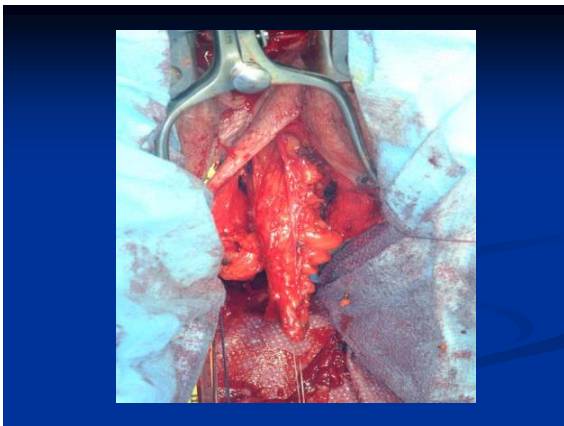
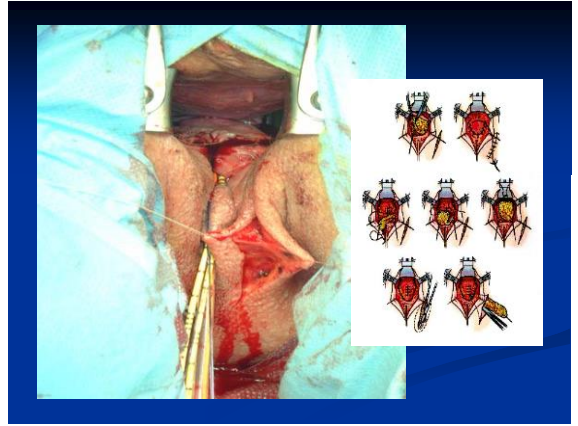
Urodynamic films and subsequent MRI
–note extension behind bladder

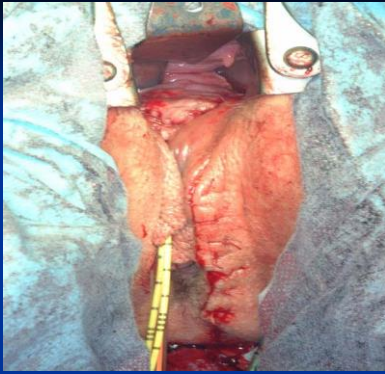
Technique

- '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









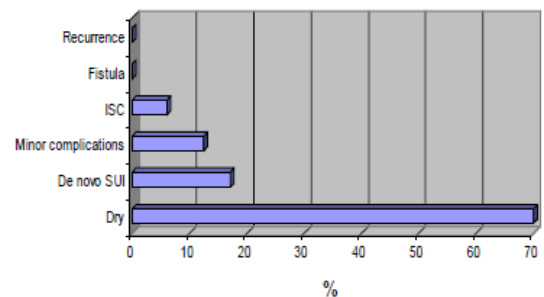
Post-operative Management

- 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

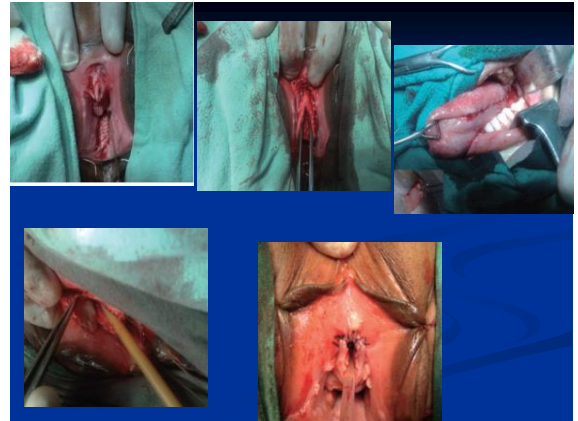
Surgical Options – Vaginal Flap

- 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