

W16: Urinary Retention in Women

Workshop Chair: David Castro-Diaz, Spain

07 October 2015 08:30 - 11:30

Start	End	Topic	Speakers
08:30	08:45	Urinary retention in women: concepts and pathophysiology	David Castro-Diaz
08:45	08:50	Discussion	All
08:50	09:05	Evaluation	Tufan Tarcan
09:05	09:10	Discussion	All
09:10	09:30	Conservative management	Cristina Naranjo-Ortiz
09:30	09:35	Discussion	All
09:35	09:55	Medical and surgical management	Christopher Chapple
09:55	10:00	Discussion	All
10:00	10:30	Break	None
10:30	11:20	Typical clinical cases discussion	All
11:20	11:30	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

1. Identify urinary retention in women, its etiology and risk factors.
2. Carry out proper diagnosis of urinary retention in women as well as its relationship with risk and influent factors.
3. Properly manage female acute and chronic acute and chronic urinary retention with the different approaches including conservative, medical and surgical therapies.

Urinary retention in women: concepts and pathophysiology

D. Castro-Diaz

Prof. of Urology, University of La Laguna
Hospital Universitario de Canarias
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 postvoid residual (PVR) (Varied significance)

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

Aging

-Acontractile bladder

- Failure of sphincteric 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

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

Two thick muscular layers:
 Longitudinal inner and circular outer
 Both extensions of detrusor muscle
 Ending in the distal fourth of the urethra into a thick collagenous ring (Lyon's ring)

Relevant to surgical planning

- Erectile tissue of the clitoris and neurovascular bundles
- Location of urogenital sphincter

Etiology of urethral stricture in women

Rare entity
 Controversial etiology
 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 (periurethral fibrosis)

Small series & case reports
 Tuberculosis, vulvar dystrophy, lichen sclerosis, primary carcinoma, fibroepithelial Polyps, urethral leiomyoma, bladder drained pancreatic transplants, post TURBT Resection of sacrococcygeal teratoma & after female-to-male transsexual reconstruction

**Urethral stricture in women
 Diagnosis**

Symptoms
 Frequency & urgency, dysuria, hesitancy, dribbling, incontinence and recurrent UTI (Migliari 2006)
 Urinary retention (Merimsky 1985)
 Renal failure, hydronephrosis & pyelonephritis (Romero 1995)
 Stricture should be suspected if there is difficulty instrumenting the patient

Physical examination
 Urethral calibration
 Meatal stricture

Voiding cystourethrogram (VCUG)

Urethroscopy

Urodynamics

Urodynamics and BOO in women

2 or more of

- Q max < 12 ml/sec
- Pdet@Qmax > 50 cm H2O
- Urethral resistance (Ped@Qmax/Qmax²) > 0.2

+
 "Significant" postvoid residual volume

Massey & Abrams 1988

Qmax < 15 ml/sec + Pdet@Qmax > 20 cm H2O
 Sensitivity = 74.3% Specificity = 91.1% for detecting BOO
 Chassigne 1998

Q max = 12 ml/sec (2-34) & median Pdet@Qmax = 37 (10-116)

Blaivas & Groutz nomogram for BOO
 4 categories from no obstruction to severe obstruction
 Poor correlation with symptom score index

Nitti 1999 !Pressure-flow studies alone may fail to diagnose female BOO!

Female Urethral Dilatation for LUTS

Lyon & Smith 1963 : LUTS in girls were due to distal urethral stenosis

↓

Empiric treatment of women and young girls with dysfunctional voiding & recurrent UTI

Today: Pelvic Floor Dysfunction

However 21% of urologists trained more than 12 years ago consider it very succesful (Lemack 1999)

↓

Avoid urethral dilatation

Background on Pelvic Floor Dysfunction (or 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

Background on Pelvic Floor Dysfunction (or Dysfunctional Voiding)

- True Incidence not known 4.2% and 46.4% (Sinha 2011)
- 2% of Urodynamic investigations (Groutz 2001)
- Sometimes with DOA, low compliance or V-U reflux (Jorgensen 1982)

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

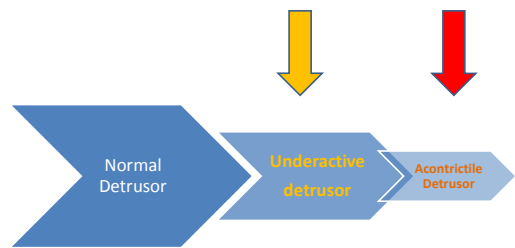
Background of Primary Bladder Neck Obstruction

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)

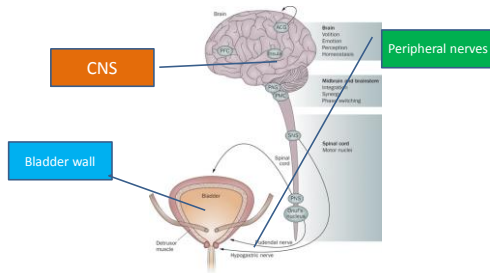
ICS Definition of detrusor underactivity

- Is defined as a contraction of reduced strength and/or duration, resulting in prolonged bladder emptying and/or a failure to achieve complete bladder emptying within a normal time span
- DU is a urodynamic diagnosis based on a pressure-flow study and characterized by a low pressure, poorly sustained, or wavelike detrusor contraction with an associated poor flow rate
- What about patients voiding completely with Valsalva?

Detrusor Function



DETRUSOR UNDERACTIVITY PATHOPHYSIOLOGY



Nature Reviews Urology 7, 572-582 (October 2010) | doi:10.1038/nrurol.2010.147

Bladder Underactivity

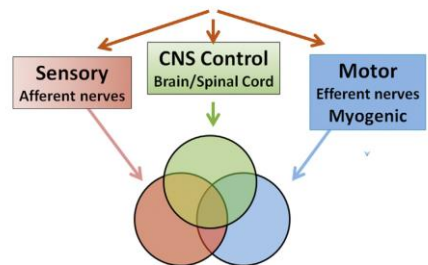


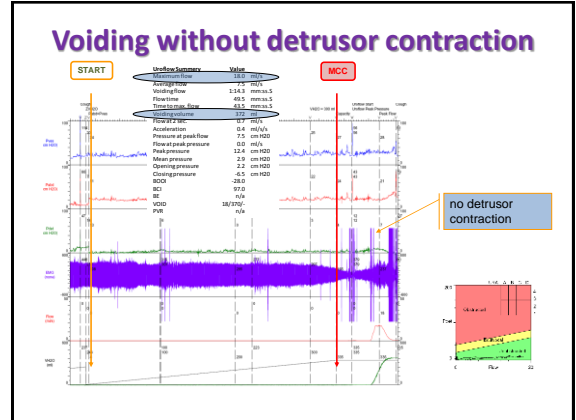
Fig. 1 – Mechanisms involved in bladder underactivity. CNS = central nervous system.



EUROPEAN UROLOGY 65 (2014) 399–401

NEUROGENIC DETRUSOR UNDERACTIVITY

This is a urodynamic dg

- diabetes mellitus
- Parkinson disease
- multiple sclerosis (*cerebral lesion*)
- injury to the spinal cord and cauda equina (eg, herniated disc, pelvic fractures),
- infectious neurologic problems (eg, AIDS, herpes zoster infection),
- iatrogenic factors (e.g. pelvic surgery, radical prostatectomy)



Female Urinary Retention (FUR): Evaluation

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

W16, ICS, October 7, 2015, Montreal

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
- Besides the transient causes, the etiology is related either to detrusor underactivity or increased outlet resistance (sphincteric or anatomic) or to both of them
- The influence of psychogenic factors, surgical interventions and co-morbidities as possible triggers remain to be clarified.

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
- FUR will resolve in a group of patients just with CIC after transient factors are eliminated


Transient causes of FUR:

Invasive tools such as invasive UDS or cystoscopy should be delayed if transient causes are present

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

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.



Elsevier Journal of Medical & Surgical Urology

ORIGINAL ARTICLE

Aetiology and management of acute female urinary retention

Imran Ahmad^{a,*}, Nalagatla Sarath Krishna^b, Douglas Ramsay Small^b, Ian Graeme Conn^b

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

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

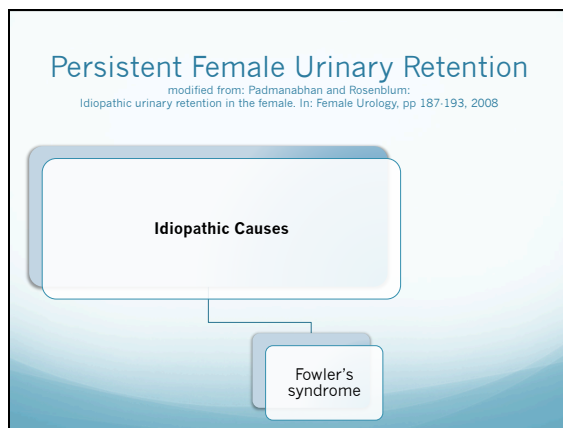
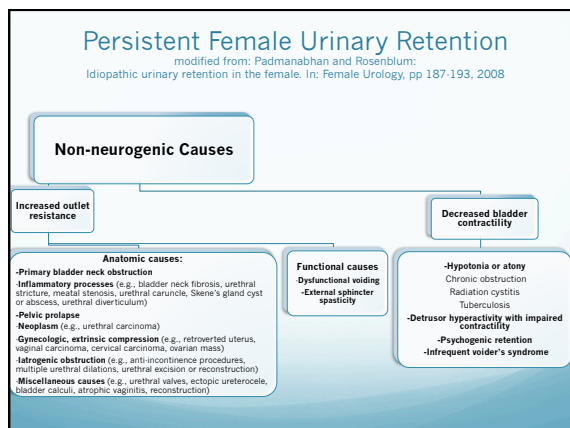
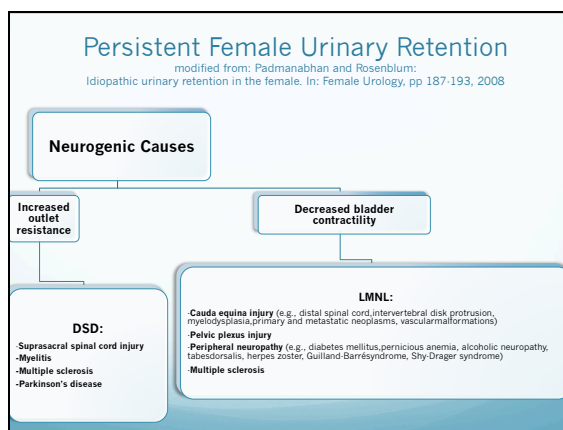
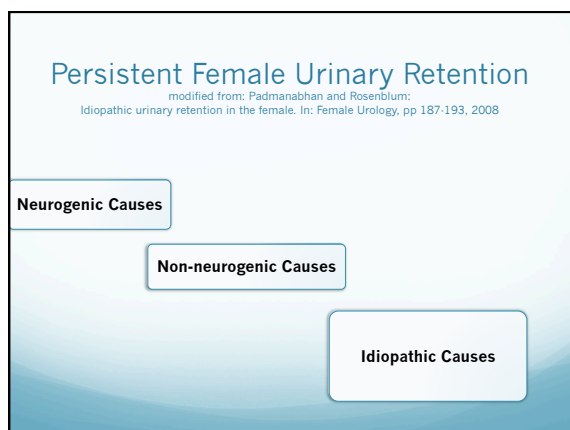


Actas Urológicas Españolas

ORIGINAL ARTICLE

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

G. García-Fabrique^a, G. Morales, S. Arlandino, M.A. Benito, J.F. Jimenez-Cruz



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

The type of onset and age: There is a specific event that triggers FUR in about half of the pts

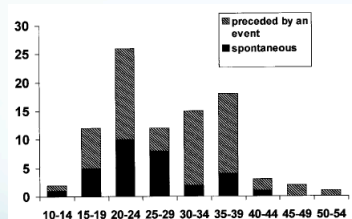


Fig. 2. Age distribution of women at initial complete urinary retention episode and role of specific events related to onset.

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

MICHAEL J. SWINN, OLIVER J. WEISMAN, JUDITH LOWE and CLARE J. FOWLER
From the Department of Urology, National Hospital for Neurology and Neurosurgery, London, United Kingdom

Basic steps of evaluation (2)

- Detailed history
 - Childhood voiding history
 - Previous surgery
 - Anti-incontinence or other pelvic surgeries
 - Co-morbidities
 - Hormonal status, DM
 - Medications that cause retention
 - SSRI, alpha agonists, anticholinergics, Calcium channel blockers, Opioid analgesics, Psychotropic drugs
 - Constipation
 - Gynecological history
 - PCO, endometriosis

Basic steps of evaluation (3)

- Physical examination
 - Abdominal and sacral examination
 - Pelvic examination
 - Urethra, prolapse
 - Focused neurological examination
- Renal function tests and urine analysis

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 preferred when available
- Since no test can accurately differentiate neurologic from non-neurologic female urinary retention, careful neurourologic evaluation will help guide to more appropriate management. (ICI 2013)

Problems with PFS

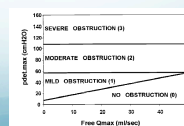
- Women empty their bladders by relaxing the pelvic floor,
 - sometimes with the additional help from the abdominal muscles
 - without a strong detrusor contraction compared to men.
- Small changes in Pdet may define BOO
 - Difficult to develop reliable diagnostic nomograms
- Many women cannot void in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

Suggested criteria for female BOO (1)

- Qmax of 15 ml/s or less combined with pdetQmax of 15 cm H2O or more
 - Had a sensitivity of 80 % and a specificity of 83.1 % for BOO.
 - Chassagne et al, 1998
- The same group revised their cutoff values
 - Using women with SUI as controls
 - Lemack, G. E. 2000
 - Asymptomatic women as controls.
 - Defreitas, G. A. 2004
- Highest sensitivity and specificity were at **Qmax 12 ml/s or less and pdetQmax 25 cm H2O or greater.**

Suggested criteria for female BOO (2)

- **Video UDS:** radiographic evidence of obstruction between the bladder neck and distal urethra in the presence of a sustained detrusor contraction of any magnitude during voiding...
 - no strict pressure flow criteria
 - Nitti et al, 1999
- Nomogram based on **noninvasive Qmax and pdetmax**
 - Blaivas & Groutz, 2000



Suggested criteria for female BOO (3)

- Comparison of 5 contemporary urodynamic definitions for female BOO on women who underwent videoUD
 - Video-UD criteria and 1998 cutoff point criteria had the highest concordance.
 - The Blaivas-Groutz nomogram overestimates obstruction
 - Not to be used as the sole definition of BOO
 - Akikwala et al, 2006

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

- 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 and, therefore, a primary disorder of sphincter relaxation rather than inappropriately timed sphincter activity that occurs in neurogenic detrusor-sphincter dyssynergia as the cause of urinary retention.

1985; 2001; 2005
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THE CAUSE AND NATURAL HISTORY OF ISOLATED URINARY RETENTION IN YOUNG WOMEN
MICHAEL J. SWINN, OLIVER J. WEISMAN, ETHENE 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

- More than an involuntary sphincter contraction, over the years thinking evolved to include the concept that the involuntary contraction of the sphincter has a reflex effect inhibiting detrusor contractions.
- The trigger is not known: Hormonal disturbance (progesteron deficiency in PCO), opiates, childbirth etc...?
- Should be spared to unexplained persistent cases

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 From the Department of Neuro-Urology, National Hospital for Neurology and Neurosurgery, London, United Kingdom

Concentric needle EMG of the external urethral sphincter

Normal resting interference pattern with 3 or 4 motor units firing tonically

Increasingly expanding time base from 30 to 3 mseconds per division, so that wave form of complexes firing repetitively become apparent and form burst discharge (top)

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available at www.sciencedirect.com
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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

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 Vol. 173, 105-106, January 2005
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What is found after completing the evaluation? The answer depends on in which setting we are working.

Table 2 Percentage of identified causal groups.

Etiologic groups	N (%)
Neurological causes	53 (26%)
Diabetes mellitus	22 (11%)
Gynecological causes	19 (9%)
Urological causes	16 (8%)
Immediate postoperative	12 (6%)
Pharmacological causes	10 (5%)
Digestive causes	3 (2%)
Psychogenic cause	21 (10%)
Unknown cause	46 (23%)

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Causes, characteristics and mid-term course of acute urinary retention in women referred to a urodynamic unit†
G. García-Farriquet^a, G. Novick, S. Kralovich, H.A. Smith, J.F. Zinner-Cruz

Neurourology and Urodynamic 28:538-542 (2005)

What is found after completing the evaluation?

- 65% reported an associated and possibly contributory factor involving the onset of retention.
 - 35% spontaneous
- In two-thirds of cases it was an operative procedure.
 - preponderance of gynecologic procedures of the overall operations performed.
 - Miscellaneous operations were diverse and included ear surgery, knee operations in 2 women, breast lumpectomy, appendectomy and a shoulder operation.
- Childbirth, %15
 - Of these women 13 undergone vaginal delivery, including 6 with epidural anesthesia
- Other: 7%

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

Psychogenic urinary retention (PUD)


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

Psychological Urinary Dysfunction:
 A Uro-Neurological Assessment
 Ryohji Sakai^{a,b,c,d,e}, Tetsuya Ishiyama^a, Toru Aoyama^c, Takashi Yamamoto^d, Takahiro Ino^e, Ryoji Yamamoto^f, Masa Kitano^g, Chikara Yamaguchi^g
 Department of Urology, ^aNippon Medical School, ^bDepartment of Urology, ^cDepartment of Urology, ^dDepartment of Urology, ^eDepartment of Urology, ^fDepartment of Urology, ^gDepartment of Urology

PUD

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


Neurology and Uroynamics 24:510-514 (2007)

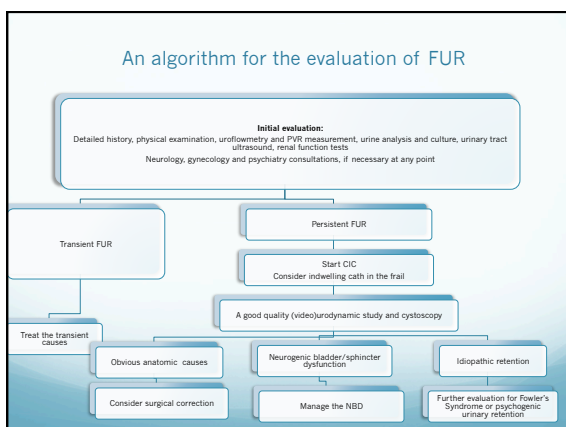

Psychogenic Urinary Dysfunction: A Uro-Neurological Assessment
 Ryuji Sakakibara,^{1,2} Takanori Uchiyama,³ Yasuko Arai,⁴ Shi-Jin⁵ Teraoka, Takanori Uchiyama,⁶ Takashi Ito,⁷ Kazuo Yamamoto,⁸ Akira Goto,⁹ Chikako Yonaguchi,¹⁰ Masahiko Yamashita,¹¹ and Takahiro Sakurai¹²

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

Neurology and Uroynamics


Fowler's Syndrome of Urinary Retention: A Retrospective Study of Co-Morbidity
 Ingrid Heintzmann,¹ Ian Stone,² Clive Fowler,³ Sany Sheril-Coker,⁴ Alan Daines,⁵ and Mark Pringle⁶



Conclusions

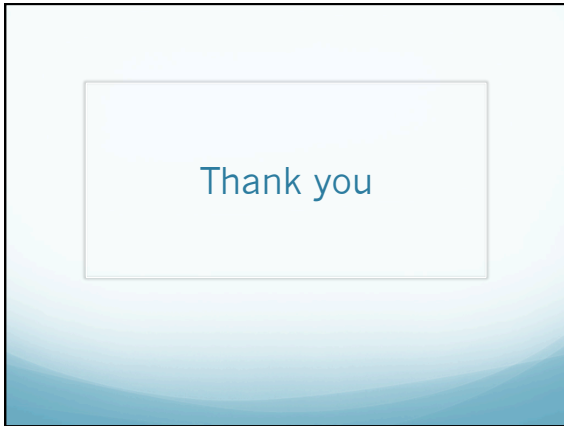
- The multi-factorial etiology of FUR is complicated and poorly understood.
- A considerable amount of pts with FUR have transient causes that can be diagnosed by a structured clinical evaluation.
- CIC with elimination of transient causes will be enough to cure half of the patients.

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



Management of Female Urinary Retention - Medical and Surgical



Christopher Chapple
 Consultant Urological Surgeon
 Sheffield Teaching Hospitals
 NHS Foundation Trust
 UK

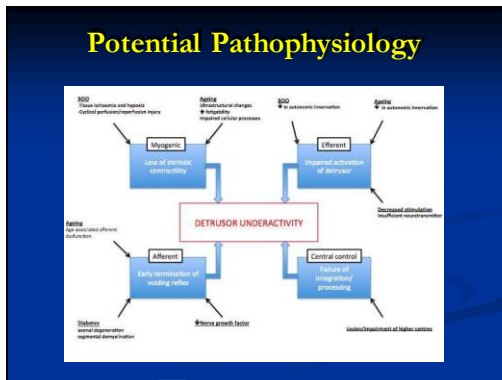
Causes of female Retention

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

Pathogenesis

*Likely major contributory factors

Type	Causes
Idiopathic	?Normal Ageing* ?Unknown cause in younger population*
Neurogenic	Parkinson's Disease Diabetes Guillane-barre syndrome Multiple sclerosis Spinal- lumbar disk hernia / spinal cord injury / congenital
Myogenic	Bladder outlet obstruction* Diabetes*
Iatrogenic	Pelvic surgery Radical Prostatectomy Radical Cystectomy Radical Hysterectomy Anterior Resection, abdomino-perineal resection




Management using Continence Products

5th International Consultation on Incontinence
 Paris: February 2012

Committee 20: Alan Cottenden (UK),
 Mandy Fader (UK), Cheryle Gartley (USA),
 Daniela Hayder (Ger) and Mary Wilde (USA)
 Consultants: Donna Bliss (USA), Brian Buckley (Ire), Joan Ostaszkievicz (Aus)

Men and women: urinary catheters



- 1 very large retrospective study (25k SCI pts) showed that use of CIC has increased over the last 30 years but use of CIC and sheaths were more difficult to sustain than IDC.
- 1 large survey (719 US hospitals) showed that most catheter placements were not tracked and 'reminders' to remove were rarely used.
- 1 small RCT (supra-pubic vs CIC post uro-gynae surgery)

Pharmacological Options

- Parasympathomimetics
- Alpha Blockers
- Intravesical therapy – prostaglandins

None successful
Recommendation D level 2/3

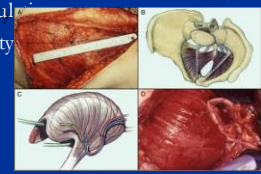
Parasympathomimetics

Reference	Indication and outcome	Outcome	Outcome level
1	1. treatment of UUB after prostatectomy	1. treatment of UUB after prostatectomy	2b
2	2. treatment of UUB after prostatectomy	2. treatment of UUB after prostatectomy	2b
3	3. treatment of UUB after prostatectomy	3. treatment of UUB after prostatectomy	2b
4	4. treatment of UUB after prostatectomy	4. treatment of UUB after prostatectomy	2b
5	5. treatment of UUB after prostatectomy	5. treatment of UUB after prostatectomy	2b
6	6. treatment of UUB after prostatectomy	6. treatment of UUB after prostatectomy	2b
7	7. treatment of UUB after prostatectomy	7. treatment of UUB after prostatectomy	2b
8	8. treatment of UUB after prostatectomy	8. treatment of UUB after prostatectomy	2b
9	9. treatment of UUB after prostatectomy	9. treatment of UUB after prostatectomy	2b
10	10. treatment of UUB after prostatectomy	10. treatment of UUB after prostatectomy	2b
11	11. treatment of UUB after prostatectomy	11. treatment of UUB after prostatectomy	2b
12	12. treatment of UUB after prostatectomy	12. treatment of UUB after prostatectomy	2b
13	13. treatment of UUB after prostatectomy	13. treatment of UUB after prostatectomy	2b
14	14. treatment of UUB after prostatectomy	14. treatment of UUB after prostatectomy	2b
15	15. treatment of UUB after prostatectomy	15. treatment of UUB after prostatectomy	2b
16	16. treatment of UUB after prostatectomy	16. treatment of UUB after prostatectomy	2b
17	17. treatment of UUB after prostatectomy	17. treatment of UUB after prostatectomy	2b
18	18. treatment of UUB after prostatectomy	18. treatment of UUB after prostatectomy	2b
19	19. treatment of UUB after prostatectomy	19. treatment of UUB after prostatectomy	2b
20	20. treatment of UUB after prostatectomy	20. treatment of UUB after prostatectomy	2b

*UUB=Underactive urinary bladder WG-Wertheim-Meig
Barendrecht MM, Oelke M, Laguna MP, Michel MC.
BMJ International. 2007; Apr; 09:749, 52

Surgery

- Trans urethral resection of prostate
- prostatecteric Botulinum Toxin
- Intrasphincteric Botulinum Toxin
- Sacral Neuromodulation
- Detrusor Myoplasty



Causes of female Retention

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

Conservative Treatment Options

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

Definitive Treatment Options

- Midurethral Synthetic Slings
 - Sling incision
 - Sling loosening (early)
 - Urethrolisis
- Traditional Slings
 - Sling Incision (PV sling)
 - Urethrolisis
 - Transvaginal
 - Retropubic
 - Suprapental (infrapubic)
 - Cut suspension/sling sutures
 - No published peer-reviewed series

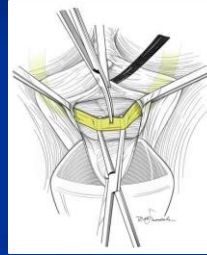
Technique of Mid Urethral Sling Loosening 1-2 weeks

- 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

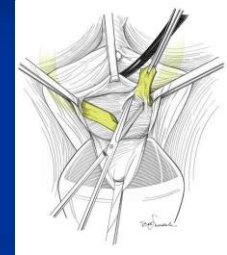
Autologous or Biological Sling Incision

- Inverted U or midline incision
- Isolation of sling in the midline
- Incision of the sling
- *If sling cannot be identified, proceed with formal transvaginalysis urethrolysis*

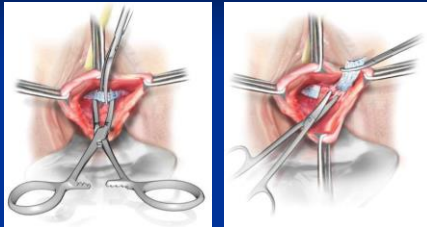


Autologous or Biological Sling Incision

- Freeing of the sling from the underlying urethra
 - May require sharp or blunt dissection
- No perforation of the the endopelvic fascia
- No freeing of the urethra from the pubic bone
- Closure of the vaginal wall

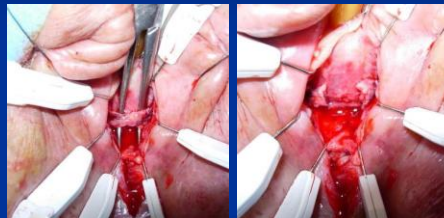


Midurethral Synthetic Sling Incision

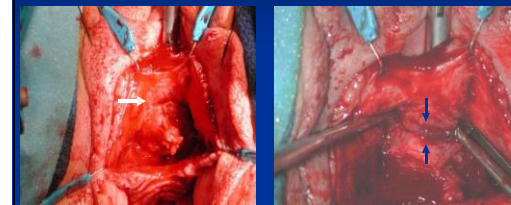


- If the sling is difficult to identify can go lateral to the midline especially for TO slings
- It is critical to identify the sling with certainty (consider pathologic confirmation)

Obstructing Midurethral Sling at 11 months

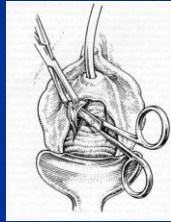


Obstructing Midurethral Sling Complete Retention at 3 months



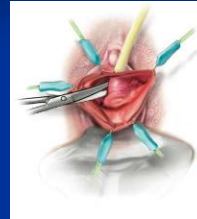
Transvaginal Urethrolysis

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



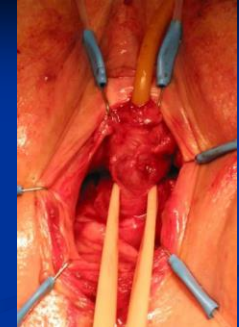
Transvaginal Urethrolysis

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



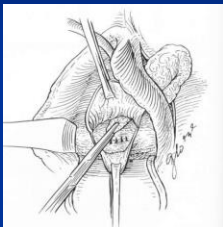
Illustrations from Vaginal Surgery for The Urologist
Nehi VW, Rosenblum NB, Brucker RM, Eschever 2012

- Place penrose drain around the urethra



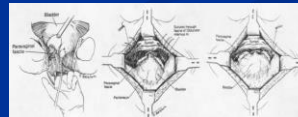
Transvaginal Urethrolysis

- Optional - Interposition of Martius Flap



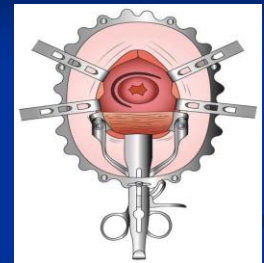
Retropubic Urethrolysis

- 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



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

<ul style="list-style-type: none"> ■ ANATOMICAL ■ Gynae; POP, fibroids ■ Post surgical ■ Urethral stenosis/diverticulum ■ Ureterocoele ■ Foreign body 	<ul style="list-style-type: none"> ■ FUNCTIONAL ■ Underactive Bladder ■ Bladder neck obstruction ■ Pseudodyssynergia ■ Neurological <li style="border: 1px solid black;">■ Fowler's syndrome
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Abnormal electromyographic activity of the urethral sphincter, voiding dysfunction, and polycystic ovaries: a new syndrome?

O'Leary J, Thomas J, Chalmers J, Oulphoe R, Chaplin H, Finnemore L, Houghton R, Kelly J, Howard S, McCulloch D. *BJU Int* 2007; 99: 1201-1206

Abstract

A series of 25 women with voiding dysfunction and abnormal electromyographic (EMG) activity of the urethral sphincter, voiding dysfunction, and polycystic ovaries (PCO) were identified. The women had a mean age of 42 years (range 30-55 years). All women had a history of voiding dysfunction and abnormal EMG activity of the urethral sphincter. The mean voiding volume was 150 mL (range 100-200 mL). The mean voiding time was 10 minutes (range 5-15 minutes). The mean voiding time was significantly longer than that of the control group (P < 0.001). The mean voiding time was significantly longer than that of the control group (P < 0.001). The mean voiding time was significantly longer than that of the control group (P < 0.001).

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; 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
 Ravia R¹, DasGupta R¹, Critchley H², Fowler C³, Griffiths D³
¹ National Hospital for Neurology and Neurosurgery, ² University of Sussex, ³ University of Pittsburgh

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

Hypothesis / aims of study
 A subset of young women with chronic urinary retention of a particular pathogenesis may have little bladder sensation and be unable to contract the detrusor. In the 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 situated 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 retract. 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.

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

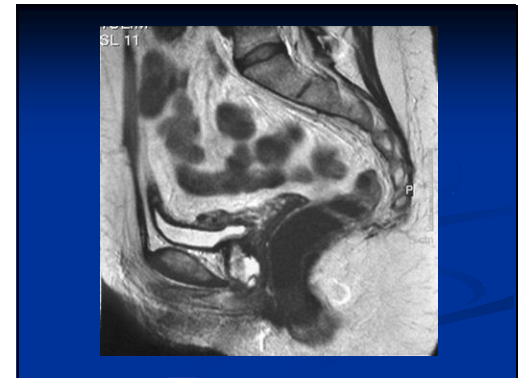
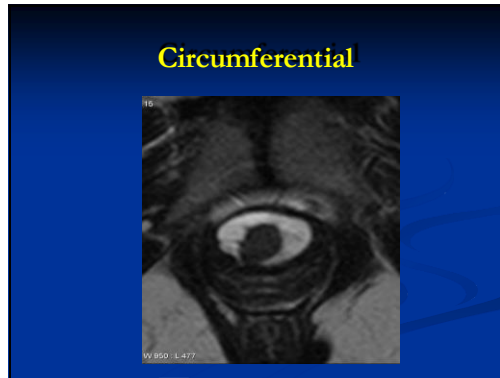
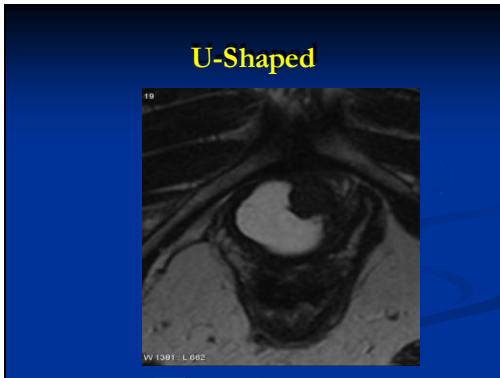
Concluding message
 In the condition of urinary retention, an involuntarily overactive sphincter exaggerates the spinal pre-contraction reflex. By suppressing bladder afferents, PAG activation is blocked, sensation elevated and detrusor contraction inhibited. SNM appears to re-open afferent pathways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

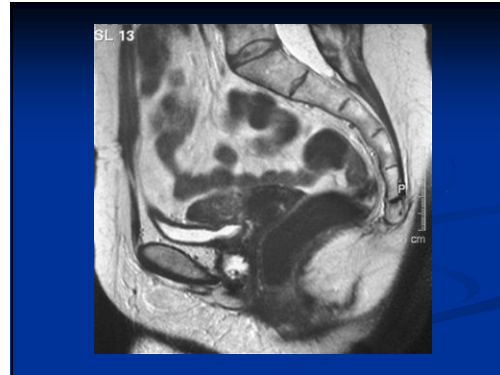
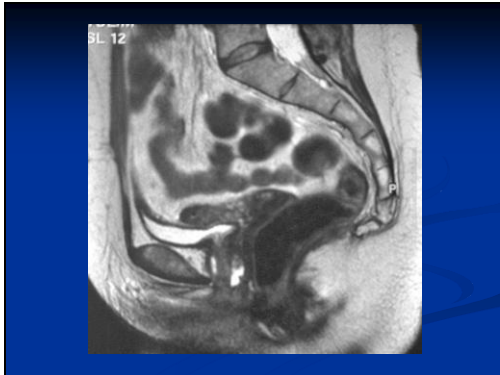
EMG-negative Fowler's syndrome

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

Causes of female Retention

<ul style="list-style-type: none"> ■ ANATOMICAL ■ Gynae; POP, fibroids ■ Post surgical ■ Urethral stenosis/diverticulum ■ Ureterocele ■ Foreign body 	<ul style="list-style-type: none"> ■ FUNCTIONAL ■ Underactive Bladder ■ Bladder neck obstruction ■ Pseudodyssynergia ■ Neurological ■ Fowler's syndrome
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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

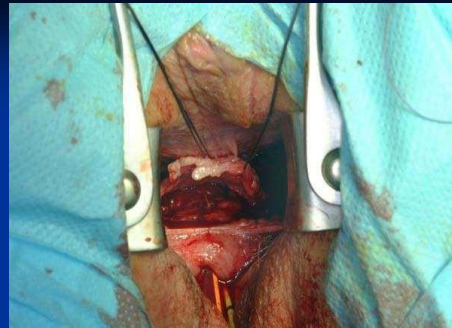
- Sim's Position rather than standard lithotomy
- Self retaining retractor –eg Parkes
- Good light
- Suction
- Infiltrate with fluid (adrenaline)

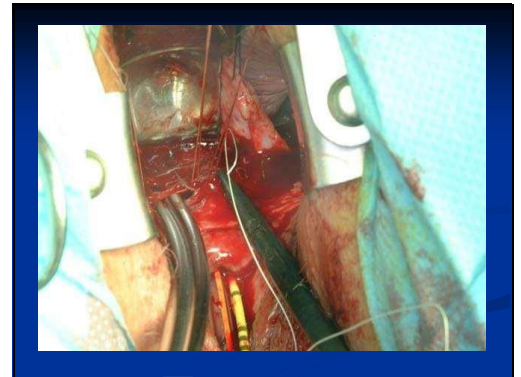
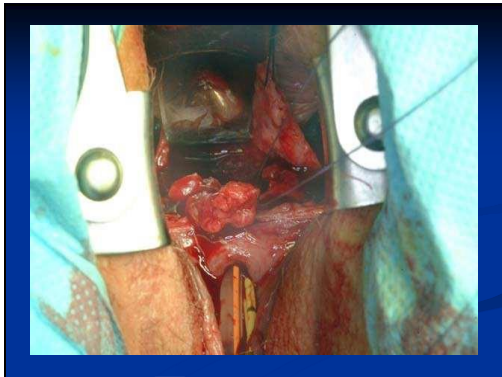
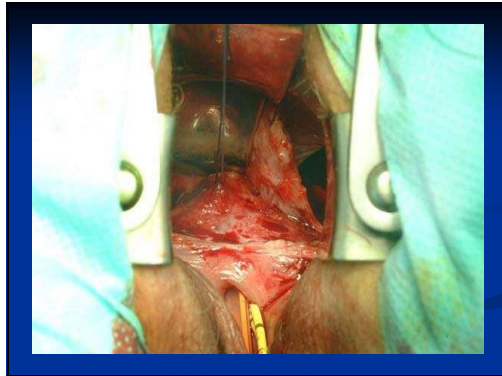
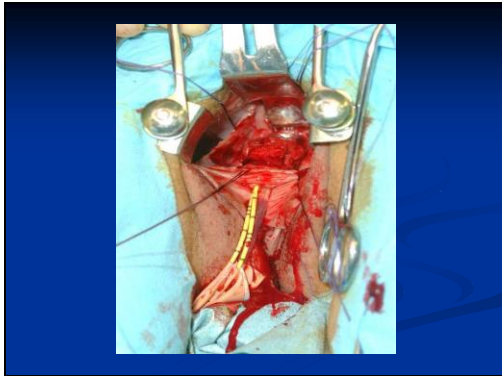


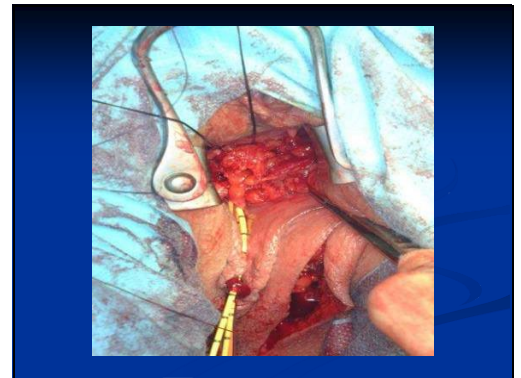
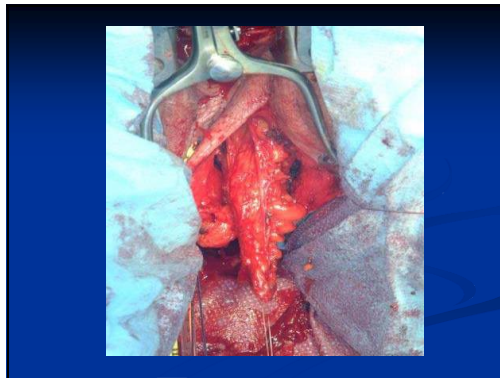
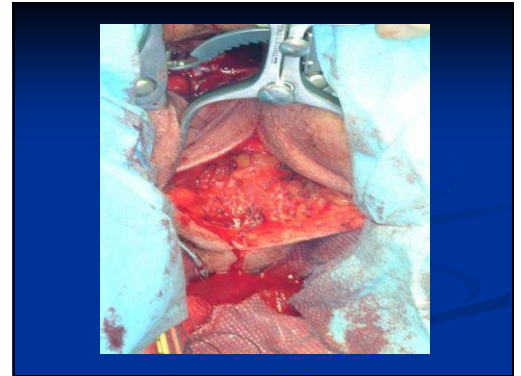
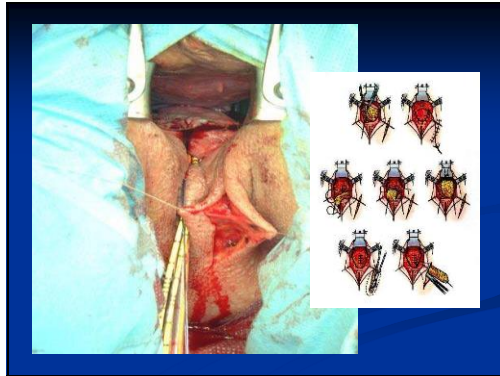
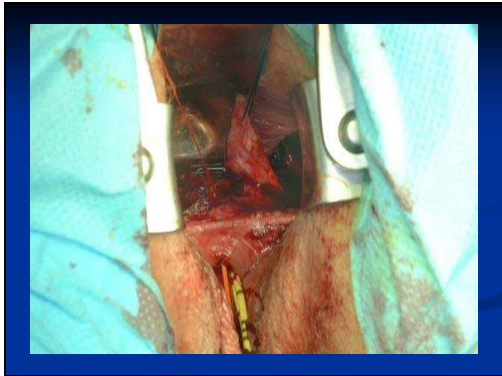
Urodynamic films and subsequent MRI
–note extension behind bladder

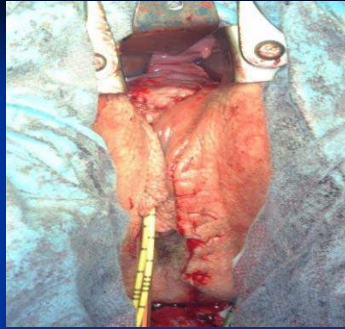
Technique

- 'U' Flap of vaginal mucosa
- Dissection of the diverticulum
- Closure in layers = careful repair of the urethra
- urethra flap
- Martius flap of repair
 - Overclosure of repair incontinence
 - 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

Post-operative complications

- Stress Incontinence
- Urethrovaginal Fistula
- Recurrence of diverticulum
- diverticulosis
- Urethral stenosis

TABLE 6
Continence after Rectovaginal Fistula Repair
After Urethral Diverticulectomy
and Martius Flap Interposition
at 6 Months

Performed as:	
Diverticulectomy alone (25 women)	
Continence	21 (84.0%)*
Incontinent	4 (16%)
Detrusor instability	1 (4%)†
Stress incontinence	3 (20%)‡
Diverticulectomy and bladder neck suspension (25 women)	
Continence	18 (72.0%)*
Incontinent	7
Detrusor instability	6 (86.0%)‡
Stress incontinence	1 (14.0%)†
*Dry or minimal incontinence not requiring pads	
†Dry or minimal incontinence requiring fewer than 10 pads per day for protection	
‡Incontinence requiring more than 10 pads per day for protection	

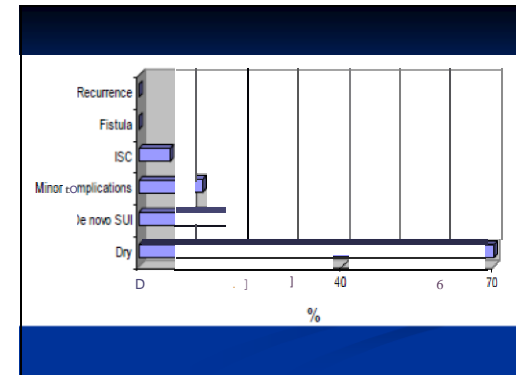
Management of symptomatic urethral diverticula – single centre experience

F. A. Reeves, C. R. Chapple, R. D. Inman
Royal Hallamshire Hospital, Sheffield UK

Results

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

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



Summary

- Common prevalence of the condition – incidental finding on scanning
- Uncommon clinical condition
- Probably follows infection of periurethral periurethral glands
- Usually mid/distal urethra

Summary

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

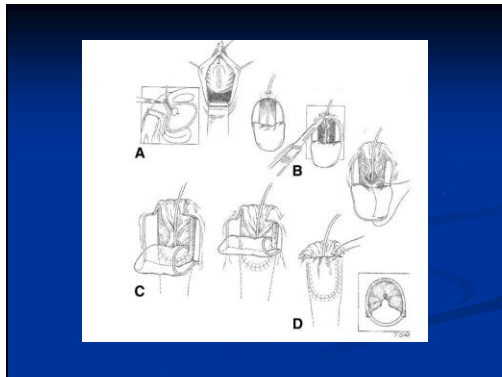
Surgical Options – Vaginal Flap

- 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



Neurology and Uroynamics 29:542-545 (2008)

REVIEW ARTICLE

Vaginal Flap Urethroplasty for Female Urethral Stricture Disease

B. Ann Goel, MD
Department of Urology, Medical Center, Lebanon, New Hampshire

TABLE I. Postoperative Patient Characteristics

Pt no.	Symptoms	Pre treatments	Incontinent (type)	PVR	Catheterizable (type)	Urethral caliber (cm)
1	Urge frequency	Dilation, urethrotomy	Yes (urge)	20	No	4
2	Urge frequency, renal failure	Dilation, urethrotomy	No	10	No	4
3	Urge frequency	Dilation, excision of urethral polyp	No	0	Yes	0
4	Urge frequency	Dilation, excision of urethral polyp	Yes (stress)	0	Yes	0
5	Urge frequency, infections	Dilation	No	Min	No	0
6	Urge frequency	Dilation	Yes (stress)	0	Yes	0
7	Urge frequency	Dilation	No	NR	No	0
8	Urge frequency, retention	Young Dees/Leadbetter procedure	NR	Yes, difficult	0	0
9 ^a	Urge frequency, retention	Dilation, ss of pelvic RT	No	10	Yes, difficult	0
10 ^a	Urge frequency	Dilation	Yes (urge)	10	No	0
11 ^a	Urge frequency, retention	Dilation, urethrotomy	No	Min	No	0
12 ^a	Urge frequency, retention	Dilation, urethrotomy	No	0	Yes, difficult	0.5

NR, not rubber catheter.
RT, right.
RTI was confirmed in three patients with urodynamics. When a UD catheter could not be placed the type of incontinence was determined by history. Measured in the office if a catheter could be placed; otherwise measured in the operating room.
^aAdditional patients.

Neurology and Uroynamics 29:542-545 (2008)

REVIEW ARTICLE

Vaginal Flap Urethroplasty for Female Urethral Stricture Disease

E. Ann Goormley, MD
Department of Urology, Medical Center, Lebanon, New Hampshire

TABLE II. Postoperative Patient Characteristics

Pt no.	Infections	Incontinence (type)	PVR (cm ³)	Urethral caliber (Fr) ^a	Further therapy needed	Follow-up (months)
1	No	Yes (urge)	20	14	Yes	46
2	No	No	10	18	No	12
3	No	No	Min	14	No	22
4	Yes ^b	No	75	18	No	113
5	No	Yes (urge)	NR	14	No	18
6	No	Yes (stress)	NR	21	No	24
7	Yes ^c	No	220	14	Yes	59 ^d
8	No	Yes (stress)	NR	18	No	12
9 ^a	No	No	NR	22	No	36
10 ^a	No	Yes (urge)	NR	22	No	15
11 ^a	No	No	Nil	17	No	3
12 ^a	No	No	Nil	22	No	4

Patients 4 and 8 had a pubovaginal sling placed at urethroplasty and patient 6 underwent bladder neck collagen injections.
^aRecurent UTIs approx. 9- and 4-year posturethroplasty both resolved with regular catheterization.
^bAdditional patients.
^cRepeat dilation 3 weeks after urethroplasty.
^dCysto in the OR 58 months after urethroplasty.
^eAdditional follow-up.

BU Dorsal vaginal graft urethroplasty for female urethral stricture disease

Steven P Petrou, Alexandra E Rogers, Alexander S Barker, Kristin M. Geen and J. William McRoberts*

Department of Urology, Mayo Clinic, Jacksonville, FL and University of Kentucky, Lexington, KY, USA
Accepted for publication: 29 February 2012

Pt no.	Age (Fr)	Urethral caliber (Fr)	Incontinence (type)	Pt no.	Follow up (months)	Urethral caliber (Fr)	Incontinence (type)	Pt no.	GI obstruction	Postop catheters
1	55	17	N	1	6	25	Y (Urge)	2	Y	N
3	66	14	Y (Urge)	3	12	26	N	3	Y	Y
4	70	16	Y (Stress)	4	18	24	N	2	N	N
5	73	16	Y (Urge)	5	19	24	N	3	Y+CC	N
6	71	14	Y (Urge)	6	11	24	N	4	N	N
7	39	14	N	7	26	20	N	N	N	N
8	75	16	Y (Urge)	8	27	20	Y (Urge)	N	N	N
9	52	14	Y (Urge)	9	33	20	Y (Urge)	2	N	N
10	62	14	Y (Stress, Urge)	10	46	24	Y (Stress, Urge)	5	N	N
11	54	14	Y (Stress, Urge)	11	46	22	Y (Urge)	N	N	N

CC, clean intermittent catheterization.

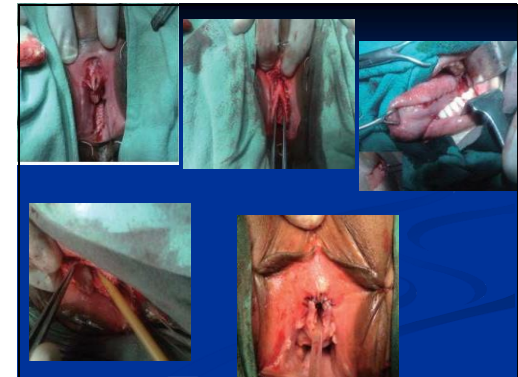
BU Dorsal onlay lingual mucosal graft urethroplasty for urethral strictures in women

Grish K Sharma, Ashwani Bhandey, Harbans Bansal, Sameer Swain, Suren K Das, Sameer Trivedi, Ulasi S. Doweddi and Patap S. Singh

Department of Urology, Institute of Medical Sciences, Banaras Hindu University, Varanasi, Uttar Pradesh, India
Accepted for publication: 2 June 2009

Indication: 16 women (mean age 42 years) with history suggestive of urethral strictures who had undergone multiple urethral dilations and/or urethral vasoprosthetic dilatation (VUD) urethroplasty after thorough evaluation from October 2005 to March 2008 and urethral width was 4-12 mm. Distal part on across the stricture segment. Bilateral G harvest from the ventral aspect of the tongue was then sutured to the urethral wall over an 18F silicone catheter.

RESULTS: The postoperative mean maximum urinary flow rate of 72 mL increased to 205 mL/s (235 mL/s and 266 mL/s) with a normal flow curve at 3, 6 and 12 months follow-up postoperative. One patient at 3 months follow-up had submucosal stricture on monthly intervals. At the 1 year follow-up none of the present patients had any recurrence of complications. No mortality or major long-term medical or aesthetic complication at the donor site.



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

Urinary Retention

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Urinary Retention

Urinary retention, defined as the inability to void, is a common medical problem. If unidentified and/or untreated, it may become a serious condition that can lead to kidney damage or urosepsis, compromising the patient's life.

Acute urinary retention (AUR) is usually easy to identify and to treat as patients usually complain of hypogastric pain and anuria. Proper bladder drainage with urethral or suprapubic catheter is the first line of treatment, with posterior studies to determine the cause of retention.

Chronic urinary retention (CUR) is often much more difficult to identify. It is invariably linked to increased post-void residual urine (PVR), but its asymptomatic nature makes it often a hidden condition. There is a wide range of intrinsic and extrinsic, obstructive and non-obstructive causes affecting the lower urinary tract, which can lead to urinary retention. Due to the differences in urinary physiology and in order to simplify diagnosis and management, these are usually studied separately in men and in women. Management consists of a variety of options depending on the cause of retention, including conservative treatment, drug therapy and several forms of surgery.

In this review, we make an overview of the main causes of acute and chronic urinary retention in men and women, focusing on the main aspects of diagnosis and management.

Key words: Urinary retention, BPH, Bladder outlet obstruction, Detrusor underactivity, Dysfunctional voiding, Fowler's syndrome

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INTRODUCTION

Urinary retention is a common medical problem. It is defined as the inability to void, totally or partially. Depending upon the time of symptoms developing, urinary retention can be classified as acute, usually also total, and chronic, usually partial.

Acute urinary retention (AUR)

The patient presents, suddenly, a complete inability to void. It is a urological emergency that causes an intense hypogastric pain due to bladder overdistension. If untreated with bladder drainage, the upper urinary tract is over-

loaded and the retrograde increase of pressure leads to acute renal failure.

Chronic urinary retention (incomplete voiding)

This is a more relative term that describes a situation in which the patient is progressively unable to full empty the bladder. It is described as incomplete emptying or elevated post-void residual. These are huge relative terms, so that identifying this condition is more complex. Symptoms of this condition are slow stream, sensation of incomplete emptying, suprapubic pain or discomfort, repeated urinary infections and even rarely pure storage symptoms (i.e. frequency or urgency).

Normal functions of the lower urinary tract are storage and timely elimination of urine. These are dependent upon the activity of two functional units in the lower urinary tract: a reservoir (the urinary bladder) and an outlet consisting of the bladder neck, urethra and striated muscles of the external urethral sphincter (1). During bladder storage, the bladder outlet is closed and the detrusor is relaxed to maintain low intravesical pressures. During voiding, the detrusor contracts and the bladder outlet relaxes to allow micturition (2, 3). This process requires coordinated work of the bladder smooth muscle (detrusor muscle) and the striated muscle from external urethral sphincter, and integrity of the anatomic structures of the bladder outlet (bladder neck, urethra and urethral meatus). Taking this into account, we can understand that urine retention can be due to bladder outlet pathology (obstruction), inefficient bladder contraction (detrusor underactivity) or the combination of both.

In men, urinary retention is frequently due to bladder outlet obstruction (BOO) as a consequence of benign prostatic hyperplasia (BPH). AUR affects between 2.8–6.8 per 1000 men, with approximately 10% of men in their 8th decade suffering at least one episode. This proportion increases to one third of men in their 90s (4). In women, the epidemiology of this condition is not well known and much worse described.

To simplify diagnosis and management, and due to the differences in the nature and physiology of male and female

lower urinary tract function, urinary retention is usual classified as urinary retention in males and in women.

URINARY RETENTION IN MALES

Acute urinary retention in males is invariably linked to BPH, being this condition the main cause. Three main risk factors have been identified to develop acute urinary retention in men with BPH (4): presence of moderate to severe lower urinary tract symptoms, depressed peak urinary flow (less than 12mL/s) and an enlarged prostate (greater than 30mL). Other factors, such as post-void residual (PVR), age and PSA serum concentration also have been linked to increased risk of AUR (6, 7).

AUR in males can present in two different forms, depending whether a trigger factor can be identified, with different future prognostic and treatment implications (8):

Spontaneous AUR: no trigger factor identified, being part of the natural history of BPH and usually after a long period of lower urinary tract symptoms. After a spontaneous AUR, 15% of patients suffer another episode and up to 75% will have surgery due to this condition.

Triggered/precipitated AUR: urinary retention is preceded by a trigger factor such as surgery/anesthesia, pain, constipation, acute medical illness, urinary infection and drugs. After a triggered AUR only 9% presents with another episode and 26% requires surgery.

In a study by Cathcart et al. with 165,527 men who had been admitted for primary AUR, it was reported that men with spontaneous AUR were 5-fold more likely to have recurrence within 6 months than men with precipitated AUR (9).

In 2005 Desgrandshamps et al (10) published an epidemiological study with 2618 patients suffering from BPH and detailed the etiology of AUR in these subjects. 71.6% of patients (1875) in this study suffered spontaneous AUR, while 28.4% (743) had precipitated AUR. The main precipitating factors described in this study were surgery with locoregional or general anesthesia, constipation with fecaloma, drugs, acute anorectal pain and acute medical illness. The initial management of AUR must be bladder catheterization, either transurethral or suprapubic, to avoid potential dangers such as acute renal failure, urinary sepsis and to alleviate pain and discomfort. There is no consensus on what is the best method of catheterization, but the feasibility of urethral catheterization makes it more frequent worldwide (11). A survey of 410 urologists in the UK shows than

TABLE I - ETIOLOGY OF URINE RETENTION

- Prostatic obstruction (BPH, PCa, Acute prostatitis, prostatic abscess)
- Bladder obstruction (bladder tumor, clot obstruction, bladder stones, high-degree cystoceles, bladder neck sclerosis)
- Urethral causes (urethral strictures, urethral tumors, hypospadias, epispadias, urethral meatus stenosis, urethral stones)
- Gynecological causes (ovarian or uterine tumors, high-degree pelvic organ prolapses, post-partum urine retention)
- Anorectal causes (fecaloma, rectal tumour, pain due to anorectal surgery, perirectal abscess)
- Post-operative urinary retention (multifactorial and relatively frequent in pelvic, vascular and orthopedic surgery)
- Neurological causes (spinal cord lesions in acute phase, metastatic spinal cord compression, demyelinating spinal cord diseases, peripheral neuropathies)
- Drugs (α -adrenergic, β -blockers, anticholinergics, antidepressants, neuroleptics, opioids)
- Psychogenic

(Adapted from Reference 5)

98% of them choose urethral catheterization as first-line treatment for AUR (12). Both methods have advantages and disadvantages. Urethral catheterization is cheaper and simpler, available in all kinds of health centers, and can be performed by most doctors and other health practitioners. A higher incidence of urinary tract infections and urethral injury/strictures has been observed with this method of catheterization (13). Suprapubic catheterization (SPC), which is much more used by French urologists [17% of them used it as a first-line treatment of AUR (10)], has also advantages and disadvantages. It avoids urethral damage and reduces the infection rates; a Cochrane review reported also about decreased levels of discomfort, particularly in younger patients. SPC allows also a trial of voiding without remove the catheter, avoiding re-catheterization if this trial fails. On the other hand, it requires specialized training to minimize serious complications (i.e. 1-3% of bowel injury) It shows also higher rates of hematuria, catheter blockage and insertion failures (10). Once the bladder is drained a complete history and physical examination, including digital rectal exam, must be performed. Measurement of drained volume of urine, serum creatinine and ions, investigation on urine infection and hematuria might be also performed. With these data, we have an initial overview about possible etiology, severity of clinical situation and possibility of hospital or ambulant management. The presence of gross hematuria, urosepsis, acute renal injury, drained urine volume >1L, significant post-obstructive polyuria, unusual symptoms (severe abdominal pain, neurological) or inability to manage with an indwelling catheter advise against an ambulatory care program (14). After the initial bladder decompression and studies, the most widely accepted treatment option is starting treating with an alpha-blocker and attempting to remove the catheter after a variable period of "bladder rest", which has been named TWOC (trial without catheterization). Age ≥ 70 years, prostate size ≥ 50 g, severe lower urinary tract symptoms, drained volume at catheterization ≥ 1000 mL and spontaneous AUR favored TWOC failure, as shown in a study by Fitzpatrick et al., with more than 6000 men catheterized for AUR in France, Asia, Latin America, Algeria and the Middle East (15). Adding an alpha-blocker prior to TWOC almost doubles the possibility of successful catheter removal, irrespective of the alpha-blocker used (15, 16). The timing of catheter removal has also been an issue of discussion. It has been observed that prolonged catheterization (>3 days) does not improve the rates of TWOC success while it increases morbidity (mainly

infections) and hospital stay (10, 15). Alpha-blockers plus TWOC after 3 to 7 days has a success rate over 50%, with the possibility, if it fails, of a second attempt with a success rate of about 25% (10).

5-alpha-reductase inhibitors (5ARIs) also play an important role in the management of urinary retention. These drugs decrease prostate volume and improve urinary symptoms in the mid- and long-term. Although they have no role in acute phase (AUR), long-term double blind versus placebo studies such as the MTOPS and CombAT (17, 18), involving more than 7000 patients during 4-4.5 years, showed that the combination therapy with alpha-blocker and 5ARI (doxazosin + finasteride in MTOPS; tamsulosin + dutasteride in CombAT) was superior to placebo than either therapy alone in terms of AUR developing, symptoms control and the need of BPH surgery (BPH progression) This improvement in disease control was specially marked in men with higher levels of PSA (>1.3-1.5) and greater prostate volumes (>30-40mL).

Chronic urinary retention is also common in older adults, but there is a lack of a standard and precise definition [the presence of PVR between 100 and 500mL has been used (19-22)] and also of well-designed epidemiological studies about incidence and prevalence. It is usually painless and almost asymptomatic from the patients' perspective, and overflow incontinence is relatively frequent. In this situation the patient suffers from a painless full-bladder with urine leaks due to overflow. Of course this is a dangerous situation with high rates of urosepsis and renal damage. Causes or diseases associated with chronic urinary retention in adults include neurologic conditions (Parkinson's disease, stroke, multiple sclerosis, dementia), myogenic conditions (diabetic cystopathy, muscular dystrophies, detrusor hyperactivity with impaired contractility, anticholinergic drugs) and chronic bladder outlet obstruction (BPH, urethral strictures, bladder neck contractures).

The management of this complex condition includes treating the underlying cause whenever feasible (medication or surgery for BPH, urethral strictures or bladder neck contractures), but in many cases the only option is intermittent or permanent bladder catheterization.

Detrusor underactivity (DUA), which causes poor or no bladder contractility, is a frequent and poorly understood phenomenon that contributes to urinary retention. The International Continence Society defines it as "a contraction of reduced strength and/or duration, resulting in prolonged bladder emptying and/or a failure to achieve complete

bladder emptying within a normal time span” (23). It includes decreased detrusor contraction strength and velocity, resulting in impaired bladder emptying efficiency. DUA is present in 9-45% of older adults undergoing urodynamic evaluation for non-neurogenic LUTS, and rates increase with advancing age (24, 25). Multiple etiologies are implicated, affecting myogenic function and neural control mechanisms probably related to the ageing process. Management, diagnostic criteria and treatment of this condition, as well as its relation and overlap degree with other urodynamic conditions, such as detrusor overactivity and BOO, need to be further studied.

URINARY RETENTION IN WOMEN

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 (26). 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 (27).

Etiology 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 (28), eosinophilic cystitis (29), inflammatory nervous disease (30), incarcerated gravid retroverted uterus (31), 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 (32, 33).

Etiology of Female Urinary Retention

Retention due to bladder outlet obstruction

- Pelvic organ prolapse
- Gynecological causes
- Post-surgery for stress urinary incontinence
- Primary bladder neck obstruction
- Urethral stricture
- Meatal stenosis
- Urethral diverticula
- Caruncle
- Lithiasis
- Ureterocele
- Foreign body
- Tumor
- Skene's gland abscess

Retention due to bladder dysfunction

- Neurological disease
- Diabetes Mellitus
- Pharmacologic
- Aging
- Pain
- Infective/Inflammatory disease
- Fowler's syndrome
- Dysfunctional voiding
- Detrusor external sphincter dyssynergia

Evaluation

Lower urinary tract symptoms in women show a poor correlation with the underlying disorder; consequently, the evaluation should be carefully performed in order to make a precise diagnosis (34).

A thorough history has a very important role in the inves-

tigation of urinary retention in women. Storage symptoms usually have a limited value in the clinical diagnosis; by contrast, voiding symptoms such as poor urinary stream, hesitancy, straining and feeling of incomplete emptying are clearly suggestive of outlet obstruction in women. The voiding history should focus on both storage and voiding symptoms. Timing of the onset of symptoms can help into the appropriate diagnosis. Past medical and surgical conditions may be essential. Defecation and sexual problems must be addressed. Fluid intake and voiding diary can help.

In cases of complete retention the bladder can usually be palpated during bimanual examination. In these cases, a full neurologic examination should be performed. An abdominal, vaginal and rectal examination must be carried out searching for constipation or fecal impaction and tenderness of the levator muscle complex. Possible causes of anatomic obstruction of the bladder outlet like urethral diverticulum, pelvic organ prolapse or other gynecological causes should be kept in mind as well.

An upper and lower urinary tract ultrasound is important to rule out repercussions on the upper tract which might compromise kidney function. Although the presence of residual urine volume does not necessarily give away the diagnosis of bladder outlet obstruction in women, it should be looked upon as an important criterion in the presence of relevant symptoms.

Urethrocystoscopy is an invasive but useful procedure in the diagnosis of bladder outlet obstruction in women. Because cystoscopy provides therapeutic possibility, it should be used as a last diagnostic test. When the obstruction is confirmed on urodynamic test, cystoscopy evaluation can be used to determine the site of obstruction.

The urodynamic test is the most useful test in the evaluation of urinary retention and the gold standard to identify the functional cause of bladder outlet obstruction. The use of simultaneous fluoroscopy is very useful to identify the level of obstruction (35). The suggested criteria for female bladder outlet obstruction are Q_{max} of 15mL/s or less, combined with $P_{det}Q_{max}$ of 15cm H₂O or more, with a sensitivity of 80% and specificity of 83.1% (36). These criteria were revised in subsequent publications, concluding that the combination of the maximum flow rate of up to 12mL/s with a detrusor pressure in excess of 25cm H₂O represented cut-off parameters with the highest sensitivity and specificity (37). Video-urodynamic investigations allow to identify bladder outlet obstruction by ra-

diographic evidence of obstruction between the bladder neck and the distal urethra in the presence of a sustained detrusor contraction of any magnitude, usually associated with reduced flow rate or delayed flow (38). Using the Blaivas-Groutz nomogram BOO is defined by the presence of free $Q_{max} \leq 12$ mL/sec in repeated free flow studies, combined with a sustained detrusor contraction and $P_{det} Q_{max} \geq 20$ cm H₂O in a pressure flow study. However, the presence of obvious radiographic evidence of BOO with a sustained detrusor contraction of at least 20cm of water and poor Q_{max} - regardless of free Q_{max} or inability of void with the transurethral catheter in place despite a sustained detrusor contraction, may also establish the diagnosis (39).

Pelvic Floor Dysfunction (Dysfunctional Voiding)

Following the recommendation of the International Urogynecological Association and the International Continence Society (40), the pelvic floor dysfunction is a term that can be applied to a wide range of symptoms and signs affecting bowel function, sexual function, urinary continence or voiding. The term 'Dysfunctional voiding' identifies "an intermittent and/or fluctuating flow rate due to involuntary intermittent contractions of the peri-urethral striated muscle during voiding, in neurologically normal individuals" (41). Incidence ranges from 4.2% to 46.4% (42). The mechanism by which this alteration occurs is not fully understood. In addition to obstructive symptoms, women with dysfunctional voiding normally have higher prevalence of storage symptoms such as frequency, nocturia and urgency (43). The average age at presentation is around 40 years (44). Video-urodynamics may show the level of obstruction at the external sphincter or pelvic floor. Furthermore, a spasmodic activity of the external sphincter can often be seen during the fluoroscopic assessment. Treatment for this condition will depend on the severity of symptoms, as there is no clear evidence that mildly symptomatic women absolutely need to be treated (33). In cases of urinary retention it is necessary to relieve the obstruction and to treat the associated symptoms (45). The first line of treatment should be pelvic floor physical therapy with biofeedback (46). Conservative therapies are preferred in patients with dysfunctional voiding related or secondary to sexual abuse, or in patients with history of depression or anxiety. Botulinum toxin injection into the external urethral sphincter is

useful for various pelvic floor disorders, but there is very limited literature about cases with dysfunctional voiding. Sacral neuromodulation is described in some studies but its use remains limited (33). Pharmacotherapy to decrease urethral resistance has not been shown to be useful in this condition, although there is a report suggesting promising results using Baclofen 10mg three times per day. Further studies are needed to confirm the reported findings of improvement on number of voids and increase in maximum flow rate (47).

Primary Bladder Neck Obstruction

Primary bladder obstruction was first described by Marion in 1933 (48); in 1973 Turner-Warwick recommend the use of urodynamics and voiding cystourethrography to diagnose this condition (49). Later on Diokno in 1984 described the condition in women (50) although the real cause remains rather unclear. Among the possible suggested causes are morphologic etiology issues related to failure of dissolution of mesenchymal tissue at the bladder neck, or inclusion of abnormal amounts of non-muscular connective tissue resulting in hypertrophy smooth muscle fiber contractures, and other inflammatory changes (51). In cases of primary bladder neck obstruction the bladder neck fails to properly open during voiding in the absence of any anatomic obstruction. This condition has been identified as the underlying cause of urinary obstruction in between 9% and 16% of urodynamic studies (35, 52). Mean age of patients suffering from primary bladder neck obstruction has been identified as 59.2 years, while voiding symptoms constitute the main patients' complaints. The level of obstruction is localized on the bladder neck. Reported urodynamic findings include increase of EMG activity in 14% of cases and a maximum flow rate of 9.74 mL/s, together with a PdetQmax of 99.72cm H₂O (53). Treatment depends on patient's status and associated conditions, relying on watchful waiting, pharmacotherapy or surgical intervention. If the patient has no evidence of upper or lower urinary tract damage, watchful waiting may be advisable. The choice of pharmacotherapy relies on the use of α -antagonists as several studies have demonstrated their effectiveness (54). If pharmacotherapy fails or in cases of complete urinary retention, a transurethral incision of the bladder neck at 5 o'clock and/or 7 o'clock may be indicated (54). The incontinence rate after this procedure has been reported as low as 3% (55).

Post-operative Urinary Retention

Urinary retention is a recognized post-operative complication in men and women. Several factors are involved in the pathophysiology, including bladder over-distention, traumatic instrumentation, reduced contractility of the bladder, increased outlet resistance, nociceptive inhibitory effect, pharmaceutical influences, preexisting outlet pathology and decreased micturition reflex activity. Incontinence surgery is a common cause of urinary retention and voiding dysfunction in women. The short-term retention rate ranges between 0% and 27%, and the long-term rate between 0% and 3.8% (56). A too-tight tape or the bad contractility of the bladder are the two most common causes. In patients undergoing midurethral sling placement, urinary retention is less likely when using the transobturator versus the retropubic approach (57). Risk factors include advanced age, presence of high post-void residual volume, use of Valsalva effort to void during pre-operative urodynamic evaluation, previous incontinence surgery or prolapse surgery, and $Q_{max} < 15\text{mL/s}$ (58). As it is difficult to predict which patients may suffer from these problems, careful post-operative monitoring is essential to identify patients who may need further intervention. The prolonged delay in treatment for those suffering from post-operative voiding dysfunction may lead to irreversible changes. A delayed de-obstructive surgery is associated with worse long-term outcomes compared to early intervention (58).

Fowler's Syndrome

Fowler's syndrome is defined as an abnormality of the external urethral sphincter in young post-menarcheal women with polycystic ovaries (40% of association), high-volume painless retention and abnormal urethral sphincter EMG (59). The precipitating event is apparently unconnected. All investigations are normal and the needle electromyographic signals are the gold standard for the diagnosis. No drug treatment has proven to be useful for this condition; all opioid analgesic drugs would need to be stopped as these might worsen the problem. Self-catheterization is an option but is usually very poorly tolerated. To restore the normal voiding the best current therapy is sacral neuromodulation (60). The mechanism of action of sacral neuromodulation is not well known; nevertheless, it is thought to be related to the release of the detrusor from presumed inhibition that emanates from the pathologic sphincter afferent activity (59).

Disclaimers

The authors have no proprietary interest with regard to this article.

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REFERENCES

1. de Groat WC, Yoshimura N. Plasticity in reflex pathways to the lower urinary tract following spinal cord injury. *Exp Neurol*. 2011;05.
2. Tai C, Roppolo JR, de Groat WC. Spinal reflex control of micturition after spinal cord injury. *Restor Neurol Neurosci*. 2006;24(2):69.
3. de Groat WC. Nervous control of the urinary bladder of the cat. *Brain Res*. 1975;87:201.
4. Jacobsen SJ, Jacobson DJ, Girmen CJ, et al. Natural history of prostatism: risk factors for acute urinary retention. *J Urol*. 1997;158:481.
5. Grise P, Sibert L. Rétentions aiguës d'urine complètes. *Encyclopedié Médico-Chirurgicale*. 18-207-D-10.
6. Meigs JB, Barry MJ, Giovanucci E, Rimm EB, Stampfer MJ, Kawachi I. Incidence rates and risk factors for acute urinary retention: the health professionals followup study. *J Urol*. 1999;162:376.
7. Mc Neill SA. The role of alpha-blockers in the management of acute urinary retention caused by benign prostatic obstruction. *Eur Urol*. 2004;45:325.
8. Hunter DJ, Berra-Unamuno A. Prevalence of urinary symptoms and other urological conditions in Spanish men 50 years or older. *J Urol*. 1996;155:1965.
9. Cathcart P, van der Meulen J, Armitage J, Emberton M. Incidence of primary and recurrent acute urinary retention between 1998 and 2003 in England. *J Urol*. 2006;176:200.
10. Desgrandchamps F, De la Taille A, Doublet JD, for the RetenFrance Study Group. The management of acute urinary retention in France: a cross-sectional survey in 2618 men with benign prostatic hyperplasia. *BJU International*. 2006;97:727.
11. Emberton M, Fitzpatrick JM. The Reten-World survey on the management of acute urinary retention: preliminary results. *BJU Int*. 2008;101Suppl 3:27.
12. Pickard R, Emberton M, Neal DE. The management of men with acute urinary retention. National Prostatectomy Audit Steering Group. *Br J Urol*. 1998;81:712.
13. Horgan AF, Prasad B, Waldron DJ, O'Sullivan DC. Acute urinary retention. Comparison of suprapubic and urethral catheterization. *Br J Urol*. 1992;70:149.
14. Teoh YJ, Kan CF, Tsui B, Chiu PK, Man CY, Hou SS, et al. Ambulatory care programme for patients presenting with acute urinary retention secondary to benign prostatic hyperplasia. *Int Urol Nephrol*. 2012;44:1593.
15. Fitzpatrick JM, Desgrandchamps F, Adjali K, Gomez Guerra L, Hong SJ, El Khalid S, Ratana-Olarn K; Reten-World Study Group. Management of acute urinary retention: a worldwide survey of 6074 men with benign prostatic hyperplasia. *BJU International*. 2012;109:88.
16. Zeif HJ, Subramonian K. Alpha Blockers prior to removal of a catheter for acute urinary retention in adult men. *Cochrane database of systematic reviews* 2009 (4).
17. McConnell JD, Roehrborn CG, Bautista OM, Andriole Jr GL, Dixon CM, Kusek JW, et al. The long-term effect of doxazosin, finasteride, and combination therapy on the clinical progression of benign prostatic hyperplasia. *New Engl J Med*. 2003;349:2387.
18. Roehrborn CG, Siami P, Barkin J, Damiao R, Major-Walker K, Nandy I, et al. The effects of combination therapy with dutasteride and tamsulosin on clinical outcomes in men with symptomatic benign prostatic hyperplasia: 4-year results from the CombAT study. *Eur Urol*. 2010;57:123.
19. Abrams PH, Dunn M, George N. Urodynamic findings in chronic retention of urine and their relevance to results of surgery. *Br Med J*. 1978;2:1258.
20. Neal DE, Styles RA, Powell PH, Ramsden PD. Relationship between detrusor function and residual urine in men undergoing prostatectomy. *Br J Urol*. 1987;60:560.
21. Ghalayini IF, Al-Ghazo MA, Pickard RS. A prospective randomized trial comparing transurethral prostatic resection and clean intermittent self-catheterization in men with chronic urinary retention. *BJU Int*. 2005;96:93.
22. Gallien P, Reyman JM, Amarenco G, Nicolas B, de Seze M, Bellissant E. Placebo controlled, randomised, double blind study of the effects of botulinum A toxin on detrusor sphincter dyssynergia in multiple sclerosis patients. *J Neurol Neurosurg Psychiatry*. 2005;76:1670.
23. Abrams P, Cardozo L, Fall M, et al. The standardization of terminology of lower urinary tract function: report from the Standardisation Sub-committee of the International Continence Society. *NeuroUrol Urodyn*. 2002;21:167.
24. Jeong SJ, Kim HJ, Lee YJ, et al. Prevalence and clinical features of detrusor underactivity among elderly with lower urinary tract symptoms: a comparison between men and women. *Korean J Urol*. 2012;53:342.
25. Osman NI, et al. Detrusor Underactivity and the Underactive Bladder: A New Clinical Entity? A Review of Current Terminology, Definitions, Epidemiology, Aetiology, and Diagnosis. *Eur Urol* (2013), <http://dx.doi.org/10.1016/j.eururo.2013.10.015>.
26. 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.
27. 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.
28. 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.
 29. Van den Ouden D, van Kaam N, Eland D. Eosinophilic cystitis presenting as urinary retention. *Urol Int.* 2001;66:22-6.
 30. Sakakibara R, Yamanishi T, Uchiyama T, Hattori T. Acute urinary retention due to benign inflammatory nervous diseases. *J Neurol.* 2006;253:1103-10.
 31. Myers DL, Scotti RJ. Acute urinary retention and the incarcerated, retroverted, gravid uterus. A case report. *J Reprod Med.* 1995;40:487-90.
 32. Wein A, Barret D. Voiding function and dysfunction. Chicago Year Book Medical. 1988. P.371.
 33. 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.
 34. Yande S, Joshi M. Bladder outlet obstruction in women. *Journal Midlife health.* 2011.2:11-17.
 35. Nitti VW, Tu LM, Gitlin J. Diagnosing bladder outlet obstruction in women. *J Urol.* 1999;161(5):1535-40.
 36. Chassagne S, Bernier PA, Haab F, Roehrborn CG, Reisch JS, Zimmern PE. Proposed cutoff values to define bladder outlet obstruction in women. *Urology.* 1998;51:408-11.
 37. Defreitas GA, Zimmern PE, Lemack GE, Shariat SF. Refining diagnosis of anatomic female bladder outlet obstruction: Comparison of pressure-flow study parameters in clinically obstructed women with those of normal controls. *Urology.* 2004;64:675-9. Nitti VW, Tu LM, Gitlin J. Diagnosing bladder outlet obstruction in women. *J Urol.* 1999;161:1535-40.
 38. Blaivas JG, Groutz A. Bladder outlet obstruction nomogram for women with lower urinary tract symptomatology. *Neurourol Urodyn.* 2000;19:553-64.
 39. Haylen BT, de Ridder D, Freeman RM, Swift SE, Berghmans B, Lee J, et al. An International Urogynecological Association/ International Continence Society joint report on the terminology for female pelvic floor dysfunction. *Neurourol Urodyn.* 2010.4-20.
 40. Abrams P, Cardozo L, Fall M, Griffiths D, Rosier P, Ulmsten U, et al. The standardization of terminology of lower urinary tract function: report from the standardization sub-committee of the International Continence Society. *Neurourol Urodyn.* 2002.167-78.
 41. Sinha S. Dysfunctional voiding: a review of the terminology, presentation, evaluation and management in children and adults. *Indian J Urol.* 2011;27(4):437-47.
 42. Groutz A, Blaivas J, Pies C. Learned voiding dysfunction (non neurogenic, neurogenic bladder) among adults. *Neurourol Urodyn.* 2001;20:259-68.
 43. Carlson KV, Rome S, Nitti VW. Dysfunctional voiding in women. *J Urol.* 2001;165(1):143-7.
 44. Smith PP, Appell RA. Functional obstructed voiding in the neurologically normal patient. *Curr Urol Rep.* 2006;7(5):346-53.
 45. Voorham Van Der Zalm P, Pelger R, Stiggelbout A, Elzeveveir H, Nijeholt GAL. Effects of magnetic stimulation in the treatment of pelvic floor dysfunction. *BJU Int.* 2006;97:1035-8.
 46. Xu D, Qu C, Meng H, Ren J, Zhu Y, Min Z, et al. Dysfunctional voiding confirmed by transdermal perineal electromyography, and its effective treatment with baclofen in women with lower urinary tract symptoms: a randomized double-blind placebo controlled crossover trial. *BJU Int.* 2007;100(3):588-92.
 47. Marion G. Surgery of the neck of the bladder. *Br J Urol.* 1933;5:351.
 48. Turner-Warwick R, Whiteside CG, Worth PH, Milroy EJ, Bates CP. A urodynamic view of the clinical problems associated with bladder neck dysfunction and its treatment by endoscopic incision and trans-trigonal posterior prostatectomy. *Br J Urol.* 1973;45(1):44-59.
 49. Diokno AC, Hollander JB, Bennet CJ. Bladder neck obstruction in women: a real entity. *J Urol.* 1984;132(2):294-8.
 50. Leadbetter GW, Leadbetter WF. Diagnosis and treatment of congenital bladder neck obstruction in children. *N Engl J Med.* 1959;260(13):633-637.
 51. Kuo HC. Videourodynamics characteristics and lower urinary tract symptoms of female bladder outlet obstruction. *Urology.* 2005;66(5):1005-9.
 52. Athanasopoulos A, Gystopoulos K, Giannitsas K, Perimenis P. Effect of alfuzosin on female primary bladder neck obstruction. *Int Urogynecol J Pelvic floor Dysfunct.* 2009;20(2):217-22.
 53. Kumar A, Mandhani A, Gogoi S, Srivastava A. Management of functional bladder neck obstruction in women: use of alphablockers and pediatric resectoscope for bladder neck incision. *J Urol.* 1999;162(6):2061-5.
 54. Jin X-B, Qu H-W, Liu B, Wang J, Zhang Y-D. Modified transurethral incision for primary bladder neck obstruction in women: a method to improve voiding function without urinary incontinence. *Urology.* 2012;79(2):310-3.
 55. Richter HE, Albo ME, Zyczynski HM, et al. Retropubic versus transobturator midurethral slings for stress incontinence. *N Engl J Med.* 2010;362:2066.
 56. Barber MD, Kleeman S, Karam MM, et al. Transobturator tape compared with tension free vaginal tape for the treatment of stress urinary incontinence: a randomized controlled trial. *Obstet Gynecol.* 2008;111:611.
 57. Elliot CS, Comiter CV. Evaluation and management of urinary retention and voiding dysfunction after sling surgery for female stress urinary incontinence. *Curr Bladder Dysfunct Rep.* 2012;7:268.
 58. Kessler TM, Fowler CJ. Sacral neuromodulation for urinary retention. *Nat Clin Pract Urol.* 2008;5(12):657-66.
 59. Wiseman O, Kitchen N, Fowler C. Long term results of sacral neuromodulation for woman with urinary retention. *BJU Int.* 2004;335-337.

Urinary retention in women

Conservative management

C. Naranjo Qiz, PT, PhD

Urinary Retention (UR) in women

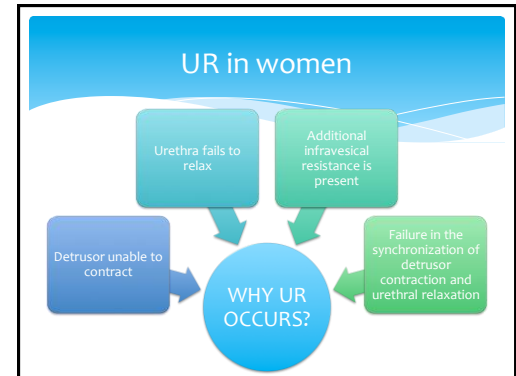
Prevalence and etiology

UR

- Acute → Postsurgical or anaesthesia
- Chronic → Neurologic, anatomic, inflammatory, functional and idiopathic

PREVALENCE

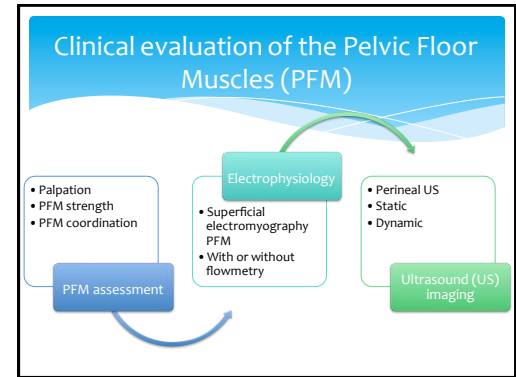
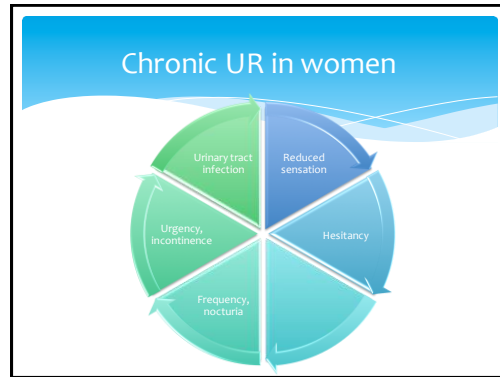
- Unknown in general (both types)
- Urodynamic reported → 12% -17%



Acute UR in women

```

    graph LR
      A[Painful or painless] --> B[Depends on neurological status]
      B --> C[Requires catheterization]
  
```



Chronic UR in women Conservative management

Recommended about three months of conservative management

In order to return to normal bladder function

Chronic UR in women Conservative management

```

    graph TD
      A[PHYSIOTHERAPY] --> B[PFMT -> Relaxation techniques]
      A --> C[Bio feedback]
      A --> D[Electrostimulation]
      B --> E[OTHER AIDS]
      E --> F[Behavioural treatment: Lifestyle changes]
      E --> G[Clean intermittent self-catheterization]
    
```

PFMT – Relaxation techniques

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

Coactivation between PFM and transverse abdominis (TA)

Adherence is very important

Feedback and biofeedback

Feedback is essential in motor learning

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

Biofeedback can be used for autonomic functions

Electrical Stimulation

```

    graph TD
      A[Stimulate afferent fibers to convey bladder filling sensation] --> B[Improve micturition coordination]
      A --> C[Stimulate efferent fibers to induce bladder contraction]
      B --> D[Relax PFM overactivity]
      C --> E[Reeducate and condition PFM]
      D --> E
    
```

Behavioural treatment: Lifestyle changes

Active use of PFM is a key voiding skill

Altering voiding habits, fluid intake and other aspects of lifestyle

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

Clean intermittent selfcatheterization



Intermittent catheterization means regularly emptying of the bladder using a catheter that is removed after each use



Larger use of hydrophilic catheters is reported to prevent urethral trauma and complications



Several recent reports support the use of single use hydrophilic catheters to reduce the risk of urological complications such as UTI and hematuria

THANK YOU

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Notes