

## CASE ONE

**Short case number: 3\_29\_01**

**Category: Endocrine and Reproductive Systems**

**Discipline: Obstetrics & Gynaecology**

**Setting: General Practice-Urban**

**Topic: Urinary Stress Incontinence**

Case
<p><b>Alanna Matheson is 45 years old, she presents 'wanting to talk about her bladder problems'. Over the last 12 months Alanna has had difficulty controlling her urine flow when she coughs and sneezes. It has been problematic over the last few weeks as she has a 'bout of bronchitis' with a particularly bothersome cough. She has now started wearing pads, because she is worried that she will 'leak' if she coughs and she is wet all the time. She has also stopped playing netball because she is embarrassed by the leakage.</b></p>
Questions
<ol style="list-style-type: none"><li>1. What key features of history will assist in determining the type of urinary incontinence problem that Alanna has and the possible aetiology? What medical conditions and medications may exacerbate her symptoms?</li><li>2. What are the key features of your physical examination and why?</li><li>3. You explain to Alanna that she most likely has urinary stress incontinence [USI]. She asks you about normal bladder function. Explain the physiology and anatomy of normal micturition and the abnormalities that occur in USI.</li><li>4. You recommend a trial of pelvic floor exercises to Alanna. Explain the function of the pelvic floor in urinary continence and how to perform pelvic floor exercises. Suggest other measures that may reduce the symptoms of stress incontinence.</li><li>5. Alanna returns several months later, she has attended a physiotherapist to assist her with her pelvic floor exercises, which she has been performing for the last 2 months, while she has noticed some improvement; she would like to explore other options. You suggest referral to a gynaecologist for urodynamic studies. What are urodynamic studies and how are they performed?</li><li>6. Alanna has heard that there are surgical procedures that can be performed to assist her problem. Outline the various surgical options for the management of USI. What non surgical options are available that may reduce the symptoms of stress incontinence?</li></ol>

### Suggested reading:

1. Abbott, J., Bowyer, L., & Finn, M. (2014). *Obstetrics and Gynaecology: an evidence-based guide* (2nd ed). Australia, Elsevier
2. Dewhurst's Textbook of Obstetrics & Gynaecology, Edmonds K [editor]. Blackwell Publishing. 2007. Chapter 49.
3. McKertich K. Urinary Incontinence: Assessment in women: stress, urge or both? Australian Family Physician, Vol 37 No 3 March 2008, pg 112-117  
<http://search.informit.com.au/documentSummary;dn=354741174617766;res=IELHEA>
4. McKertich, Karen, Urinary incontinence: procedural and surgical treatments for women. AFP Vol.37 No. 3 March 2008, page 123  
<http://search.informit.com.au.ipacez.nd.edu.au/fullText;dn=354703908675250;res=IELHEA>

## ANSWERS

### 1. What key features of history will assist in determining the type of urinary incontinence problem that Alanna has and the possible aetiology?

Alanna has symptoms of stress incontinence → involuntary leakage with exertion. She has difficulty controlling her urine flow when she coughs and sneezes. This has led to her stopping playing sport. Obesity, respiratory conditions and medications such as alpha-blockers may contribute to her symptoms.

Type of incontinence <sup>1</sup>	Pathophysiology	Symptoms
<b>Common</b>		
Stress incontinence	Lack of bladder neck support and/or poor urethral closure	Involuntary leakage on effort or exertion, coughing and or sneezing
Urge incontinence: detrusor overactivity/overactive bladder syndrome (previously called detrusor instability/unstable bladder)	Failure of cortical inhibition of sacral reflex arc Idiopathic – anxiety, coffee intake and cold weather are said to influence symptoms Neurogenic (upper motor neuron lesion, ie multiple sclerosis, spinal trauma and cerebral vascular accidents) ?urethral obstruction after surgery	Urgency: compelling desire to void, accompanied by fear of leakage and/or discomfort Day time frequency Urge incontinence: involuntary loss of urine associated with a strong desire to void Nocturia: awoken at night one or more times to void Nocturnal enuresis: bedwetting
<b>Less common</b>		
Retention with overflow	Over-distension of bladder following surgery or delivery Urethral obstruction from a pelvic mass or faecal impaction Drugs or neurological disease	Dribble incontinence, symptoms of the overactive bladder and of voiding difficulty
Fistula	Less developed countries; prolonged obstructed labour and pressure necrosis of bladder base and vagina. More developed countries: pelvic surgical complications, radiation, advanced pelvic surgery	Uncontrollable continuous leakage

### 2. What are the key features of your physical examination and why?

- **Overall health and mobility** → restricted mobility can precipitate incontinence. Cardiac failure can be a potential cause of nocturia.
- **Neurological** → sensation sacral dermatomes (S2 – S4) → perineal sensation and anal tone.
- **Abdominal/Pelvic examination** → looking for atrophic changes, prolapse, pelvic floor contraction, hypertonus, abdominal/pelvic masses, urinary retention, faecal impaction.

<sup>1</sup> O'Connor V and Kovacs G. Obstetrics, Gynaecology and Women's Health. Cambridge press, Sydney, 2003. Pg 546

**3. You explain to Alanna that she most likely has urinary stress incontinence [USI], she asks you about normal bladder function. Explain the physiology and anatomy of normal micturition and the abnormalities that occur in USI.**

The bladder is a hollow retroperitoneal pelvic organ composed of smooth muscle situated behind the pubic symphysis. Bladder function can be divided into the storage and voiding phases. The bladder is designed to store urine at low pressures less than 15cmH<sub>2</sub>O and when socially convenient, to achieve efficient complete voiding. A normal first sensation of bladder filling is noted at between 150 and 250 ml, followed by a first desire to void with a strong desire to void at about 400-600 ml (bladder capacity).

Continence is maintained by several mechanisms that allow urethral pressure to exceed bladder pressure:

- **Bladder factors:** during bladder filling bladder compliance and cortical inhibition of the sacral reflex arch all ensure that intravesicular pressure changes very little,
- **Urethral factors:** urethral pressure is maintained by the:
  - i) voluntary extrinsic urethral sphincter complex composed of striated muscle and
  - ii) involuntary intrinsic complex of circular and longitudinal smooth muscle as well as coaptation (“joining together”) produced by the rich vascular sub-mucosa and mucosal folds.
- **Pressure transmission factors:** normally bladder neck and proximal urethra are well supported intra-pelvic structures. When intra-abdominal pressure is raised, such as with coughing, this is transmitted to the proximal urethra as well as the bladder. This may be helped by active contraction of urethral striated muscle and levator complex. Thus the pressure gradient between urethra and bladder is maintained and the patient stays continent.

In general terms, in the majority of cases of incontinence, the bladder pressure exceeds the urethral pressure because the sphincter mechanism is weak (urodynamics stress incontinence) or because the detrusor pressure is excessively high (detrusor overactivity).

Stress incontinence is due to pelvic floor dysfunction→ resulting in a lack of support of bladder neck and impaired pressure transmission to proximal urethra→ the factors that maintain positive urethral closure pressure at rest are inadequate when there is increased intra-abdominal pressure→ so that urine loss is triggered by activities that cause a rise in intra-abdominal pressure (eg coughing, sneezing, jumping, lifting).

**4. You recommend a trial of pelvic floor exercises to Alanna. Explain the function of the pelvic floor in urinary continence and how to perform pelvic floor exercises. Suggest other measures that may reduce the symptoms of stress incontinence.**

Pelvic floor dysfunction results in a lack of support of bladder neck and impaired pressure transmission to proximal urethra. The focus of pelvic floor muscle training is to build the strength, endurance, speed and the coordination of the pelvic floor muscles in different situations. In some women, more training is needed to enable them to contract their pelvic floor with appropriate coordination. An appropriately trained physiotherapist can assist in pelvic floor training<sup>2</sup>.

Other measures would include:

- \* weight loss – A 10% weight loss may reduce symptoms of stress incontinence by up to 40%
- \* eliminate or reduce exacerbating factors such as smoking, effectively treat respiratory disorders, reduce medications that may cause cough, reduce activities that may increase intra-abdominal pressure.

**5. Alanna returns several months later, she has attended a physiotherapist to assist her with her pelvic floor exercises, which she has been performing for the last 2 months, while she has noticed some improvement; she would like to explore other options. You suggest referral to a gynaecologist for urodynamic studies. What are urodynamic studies and how are they performed?**

Urodynamics studies can vary from simple cystometry (where bladder pressures alone are measured) to complex cystometry where multiple pressures are measured with computer analysis and imaging. Urodynamics are useful to differentiate genuine stress incontinence and detrusor overactivity, particularly when the history is unclear. Mandatory when invasive or surgical treatments are considered. Performed by inserting a catheter and distending the bladder with fluid. Pressures can then be measured with filling and voiding. Increased pressure is noted with detrusor overactivity and not with USI, which is only increased at being full.

**6. Alanna has heard that there are surgical procedures that can be performed to assist her problem. Outline the various surgical options for the management of USI. What non-surgical options are there that may reduce the symptoms of stress incontinence.**

Non-surgical options which could be considered in patients who are either not-suitable for surgery or where an intermediate solution is required (women who have not completed child bearing) would be anti-incontinence pessaries which supports the urethra or bladder neck, injectable periurethral bulking agents, or even a simple intravaginal tampon in minor cases.

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<sup>2</sup> Neumann, P. Physiotherapy for urinary incontinence Australian Family Physician, Vol 37 No 3 March 2008 pg118-121

Procedure	Details <sup>3</sup>
<b>Colposuspension</b>	Open or laproscopic elevation of the bladder neck by suspending the vaginal fornices to the iliopectineal ligament. This was the gold standard until the advent of the mid-urethral sling which achieved similar efficacy rates without the morbidity of abdominal surgery.
<b>Synthetic mid-urethral slings</b>	<p>Use of a sling of tissue inserted vaginally under the mid-urethra (not the bladder neck) to provide pressure transmission and urethral closure.</p> <p>Advent of safe synthetic slings such as TVT (tension free vaginal tape) have made this more popular. Can also be done as a day case. The tape is passed either side of the midline to the lower anterior abdominal wall. A newer procedure passes the tape through the transobturator foramen (Monarc trans obturator tape procedure)</p>
<b>Bio-injectables/urethral bulking agents</b>	Injected cystoscopically to add bulk to urethral tissue and improve urethral mucosal coaptation. The indication for this treatment is intrinsic sphincter deficiency where the urethral closure pressure is less than 20cm H <sub>2</sub> O, or where other surgical treatments have failed.

<sup>3</sup> O'Connor V and Kovacs G. Obstetrics, Gynaecology and Women's Health. Cambridge press, Sydney, 2003. Pg 550  
 McKertich, Karen, Urinary incontinence: procedural and surgical treatments for women. AFP Vol.37 March 2008, No. 3 page 123