

POLICY STATEMENT*

GUIDELINES FOR THE EVALUATION AND TREATMENT OF URINARY INCONTINENCE FOLLOWING PELVIC FLOOR OR INCONTINENCE SURGERY

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These guidelines have been prepared by the Sub-Committee on Urogynaecology, and approved by the Council of the SOGC.

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INTRODUCTION

Patients who complain of either *de novo* or recurrent urinary incontinence following reconstructive pelvic floor or incontinence surgery must undergo a thorough evaluation to identify the cause of this incontinence.¹ Most of these patients will fall into one of the following categories.

EARLY CAUSES OF URINARY INCONTINENCE

1. Surgery was inappropriate therapy.
2. Surgical correction of stress incontinence was either unsuccessful or was not sustained.

3. Latent stress incontinence was not recognized pre-operatively.²
4. An intra-operative or postoperative complication of surgery caused the incontinence.^{3,4}

LONG-TERM CAUSES OF URINARY INCONTINENCE

1. Deficiency of connective tissue.
2. Predisposing medical conditions (e.g. Chronic obstructive pulmonary disease [COPD]).
3. Urogenital aging.
4. Although surgery was indicated, an inappropriate procedure was used.

ASSESSMENT

The assessment must be designed to identify one or a combination of the following possible problems.

1. Compromise to the urethral sphincter mechanism.⁵
2. Detrusor instability.⁶
3. Voiding dysfunction.⁷
4. Urogenital fistula.⁸
5. Persistent or *de novo* pelvic prolapse.

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URETHRAL SPHINCTER INCOMPETENCE

Extrinsic support of the urethra is critical to continence, but continence is maintained only if it is complemented by normal intrinsic urethral function.¹⁰

Normal intrinsic urethral function results from:

1. healthy urethral mucosa;
2. a normal vascular plexus;
3. smooth muscle sphincter function;
4. external striated sphincter function.

Such factors as lack of estrogen, aging tissues and denervation or disruption of muscular sphincters can result in marked impairment of intrinsic urethral sphincter function.

The majority of surgical procedures used to treat stress incontinence are designed to re-establish extrinsic urethral support.² Although the exact mechanism responsible for the re-established continence which results from successful surgery is uncertain, the only consistent postoperative urodynamic finding is enhanced pressure transmission to the urethra.¹¹ This urodynamic change is probably a consequence of better transmission of intra-abdominal pressure to the newly buttressed urethra. It is also speculated that distal support of the urethra results in a kinking of the urethrovesical junction when the proximal urethra and bladder prolapse during increases in intra-abdominal pressure.¹² Using this model, it is evident that in order for surgery to correct stress incontinence it must stabilize and position the urethra within the abdominal cavity. Failed surgery would result because this stability was not established at the time of the operation or because it was not maintained over time.

Urethrovesical junction mobility can be assessed by clinical examination (Marshall-Bonney Test) Q-tip test, ultrasound, videocystourethrography and urethroscopy. If hypermobility is found, it may be assumed that surgery has failed either to establish or to maintain the support of the urethrovesical junction. If the urethrovesical junction is maintained in an elevated retropubic position, then it can be assumed that the goal of surgery has been achieved, and failure may be a result of intrinsic urethral sphincter deficiency (ISD).¹⁰ A combination of support failure (hypermobility) and deficient intrinsic sphincter function may be found.

A patient with ISD will require a more sophisticated evaluation. A maximum urethral closure pressure of < 20 cm of water on a urethral closure pressure profile is associated with a higher failure rate of retropubic incontinence

surgery.¹³ A leak point pressure of < 50 cm of water has also been used to identify compromised intrinsic urethral function.¹⁴

Repeated surgery may cause major trauma to the urethra resulting in a scarred, rigid "drain pipe urethra" which has no sphincter function.² In this condition, the urethra is an open conduit through which urine will leak continuously. Urethroscopy will reveal a smooth rigid tube which does not coapt. The urethrovesical junction is open and can be visualized from any point along the urethra. Videocystourethrography will confirm a urethra which is immobile and open.

DETRUSOR INSTABILITY

Detrusor instability (DI), unrecognized prior to surgery, may cause persistent incontinence following surgery.⁴ *De novo* detrusor instability may develop following surgery for stress incontinence.¹⁵ Patients will usually complain of urgency incontinence. Cystoscopy may occasionally identify bladder disease responsible for the DI. Although a simple cystometrogram will identify most cases of detrusor instability, where there has been previous surgery, provocative and subtracted cystometry is indicated if the diagnosis is uncertain. In selected cases, further investigation by ambulatory cystometry may be indicated.

VOIDING DYSFUNCTION

Voiding dysfunction as a consequence of pelvic surgery may develop for several reasons.¹⁶ Patients with pre-operative dysfunctional voiding mechanisms may not be able to empty their bladders after surgical elevation of the urethrovesical junction. Excessive elevation of the urethrovesical junction may have the same result in patients with a normal pre-operative voiding mechanism. Mild degrees of incomplete emptying will appear as urinary frequency, hesitancy and nocturia. More severe voiding compromise is manifested by urinary retention, bladder distention and overflow incontinence, recurrent urinary tract infection, and possible upper tract decompensation. Simple uroflowmetry including measurement of post-void residual volume is sufficient to screen for voiding dysfunction. Post-void residual levels can be measured by catheterization, ultrasound or contrast radiography. An intermittent voiding pattern on uroflowmetry or a high post-void residual volume should prompt more sophisticated voiding studies with simultaneous measurement of



voiding pressures, urine flow rate, EMG and urethral sphincter activity. Additional anti-incontinence operations should be planned cautiously in patients with marked postoperative voiding dysfunction.

UROGENITAL FISTULA

Urogenital fistula following incontinence surgery is a rare complication.^{8,9} A fistula may exist between the vagina and the urethra, bladder, ureter, or a combination of these organs. Cystourethroscopy should permit the identification of fistulae in either the urethra or the bladder. If a fistula site is not evident, sterile milk or water mixed with indigo carmine or methylene blue solution can be instilled into the bladder during speculum examination or after tampons have been placed in the vagina. Staining of the tampon will confirm the presence of a fistula. When these tests are negative, intravenous pyelography (IVP) is indicated to identify upper tract damage. Intravenous indigo carmine with the tampon test may also identify a ureterovaginal fistula.

MANAGEMENT

Patients who experience persistent or recurrent urinary incontinence following surgery for stress urinary incontinence will fall into one of the following diagnostic categories.

A. STRESS INCONTINENCE

1. Hypermobile urethra and maximum urethral closure pressure > 20 cm of water or leak point pressure > 50 cm of water. Urethral mucosa is normal. Management is a retropubic urethropexy.²
2. Hypermobile urethra and maximum urethral closure pressure < 20 cm of water or leak point pressure of < 50 cm of water. Urethral mucosa is normal. Management is a suburethral sling procedure.¹⁷⁻¹⁹
3. Urethral mobility is decreased (urethra fixed), the urethral mucosa is scarred and the urethral closure pressure is low. Management options include an occlusive sling procedure,² periurethral collagen/fat injections,²⁰ use of an artificial sphincter,^{21,22} urinary diversion or chronic catheterization (intermittent or continuous).

B. UNSTABLE DETRUSOR

1. Cystometrogram confirms unstable bladder. The management is medical or behavioural.¹⁴

C. VOIDING DYSFUNCTION

1. Urinary frequency with moderate elevation of post-void residual volume. This problem can be managed conservatively by reassurance, drugs,²³ timed toileting, double voiding and urethral sounding.
2. Complete inability to void. This problem can be managed by intermittent self-catheterization, use of a pessary to correct the high cystocoele, or removal and replacement of the urethro-vesical junction suspension sutures or sling. If obstruction is not the cause, then sacral nerve stimulation²⁴ and pharmacological manipulation can be used.

D. UROGENITAL FISTULA

Urogenital fistulae must be corrected. There are several surgical options.²⁵ The choice of procedure will depend on the severity and location of the fistula. Description of the specific procedures is beyond the scope of this manuscript.

E. MIXED INCONTINENCE

Conservative management options for both the stress and urgency incontinence should be used, and benefits maximized before further surgery is undertaken. Fistulae and genuine stress incontinence can co-exist. If surgery is undertaken, it should correct all incontinence and pelvic floor prolapse disorders.

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