Surgical management of stress incontinence in women: The role of the family practitioner

Part 1: Pre-operative issues

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Abstract

The surgical management of stress incontinence in women should encompass a combined approach by the family practitioner and the specialist. This review, in two parts, discusses the place of the family practitioner in this process. The continence mechanism, pre-operative counselling, appropriate surgical procedures, post-operative complications and aftercare are all discussed, to enable the family practitioner to provide adequate support to the patient.

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Introduction

Stress urinary incontinence is a very real part of the lives of many South African women. Its true prevalence in SA is unknown but studies elsewhere in the world reveal figures of between 10 and 16%.[1] This is a condition with no mortality and very little morbidity but presents a profound quality of life issue. It causes social withdrawal, marital strife and can be an economic drain to the family budget. Sadly, incontinence is often a taboo subject and many women falsely believe that it is an inevitable part of bearing children and growing older, and that nothing can be done to treat the problem. This silent majority lives on stoically with the misplaced acceptance of their malady.

The family practitioner (and also the primary health care nurse practitioner) is often the interface between the patient and potential help for her medical problems. Apart from ministering to the patient's ailments the family practitioner has to uncover quality-of-life issues which the patient may not volunteer for discussion. Urinary incontinence is one of these issues.

The privilege of the family practitioner is that of being well-known to the patient and in a position of trust. He/she often has to allay fears before specialist referral. Details which the patient has understood poorly, or not at all, but was too shy to ask about at consultation, have to be explained by the family practitioner.

This two-part series of articles is about informing the family practitioner about the most common procedures used nowadays by Gynaecologists and Urologists in an attempt to cure Genuine Stress Incontinence (GSI), the pre-operative counselling of the patient, and the management of common post-operative problems.

In this first part we explore, briefly, the diagnostic process, look at the theories of why women remain continent, and discuss some common misconceptions regarding GSI.

Identifying the problem

A detailed discussion about the different types of incontinence is beyond the scope of this article and readers are referred to a detailed text.[2] It is most important that GSI be distinguished from the other types of urinary leakage, particularly the overactive bladder.[3]

This is because the management of these problems is as different as their individual etiologies. The cause of overactive bladder is located in the detrusor muscle itself, with either a myogenic or a neurogenic basis. Central to the problem here is an involuntary detrusor contraction, with management being conservative. This concentrates on lifestyle and diet modification with caffeine avoidance and fluid restriction being paramount. Bladder drill and anticholinergic pharmacotherapy are adjunct therapies. Surgery is only a very late option for severe and intractable disease.

GSI has as its basic treatment pelvic floor muscle exercises and if these don't have the desired effect, surgery, either at the bladder neck or mid-urethra, becomes an option. Many patients, unfortunately, are subjected to surgery rather

prematurely because either they have not been taught to do exercises properly, or because they lack the motivation to carry out and sustain the exercise programme, preferring a "quick-fix" instead.

It is important that the practitioner be well versed in the theory of urinary incontinence and knows how to examine the abdomen, the internal and external genitalia, and be able to do a basic neurological examination (excluding conditions like multiple sclerosis), particularly the outflow of sacral nerves 2 to 4. A useful expose of how to examine and investigate an incontinent female has been published by de Jong *et al*.[2]

Based on his/her knowledge of urinary incontinence and a sound clinical examination, the family practitioner can thus make a presumptive diagnosis, do some preliminary tests and refer the patient to the appropriate specialist. The question often asked is: "To whom to refer: Gynaecologist or Urologist?" The answer is quite simple: "To the specialist who has been adequately trained in incontinence, and has a proven track record." In this way the patient's interests are best served. Not all Urologists are interested in female incontinence and/or perform the surgical procedures regularly, and not all Gynaecologists are adequately trained in this field. Selecting the correct referral specialist obviously requires some homework!

The continence mechanism

As a point of departure, it would be useful to take a simplified look at the continence mechanism as it applies to females, specifically the anatomy pertaining to stress incontinence.

The female urethra is embedded in the adventitia of the anterior vaginal wall. Its musculature is both smooth and striated. The so-called "extrinsic urethral sphincter mechanism" is composed of striated and periurethral muscles. The outer portion of this sphincter mechanism comes from the musculature of the pelvic diaphragm. The inner portion consists of circular striated musculature around the proximal 2/3 of the urethra and two ventral striated bands at the distal 1/3. This musculature, together with levator ani, is responsible for urethral closure and continence. The maximal urethral closure pressure is generated at its midpoint. The urethra is also supplied with connective tissue and blood vessels, which augment the continence mechanism. The urethra is lined by a urothelial layer which seals off the lumen by hydrostatic pressure. This mucosa is rich in oestrogen receptors, and thus susceptible to atrophy in the postmenopausal years. (Figure 1)

Figure 1: A schematic representation of a cross- section through the female urethra

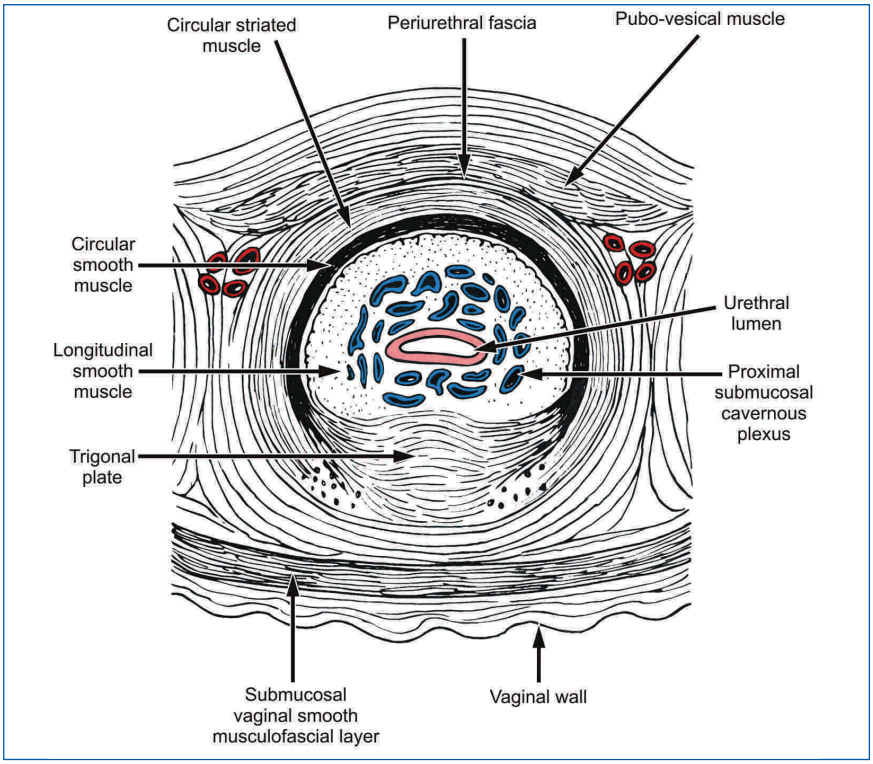
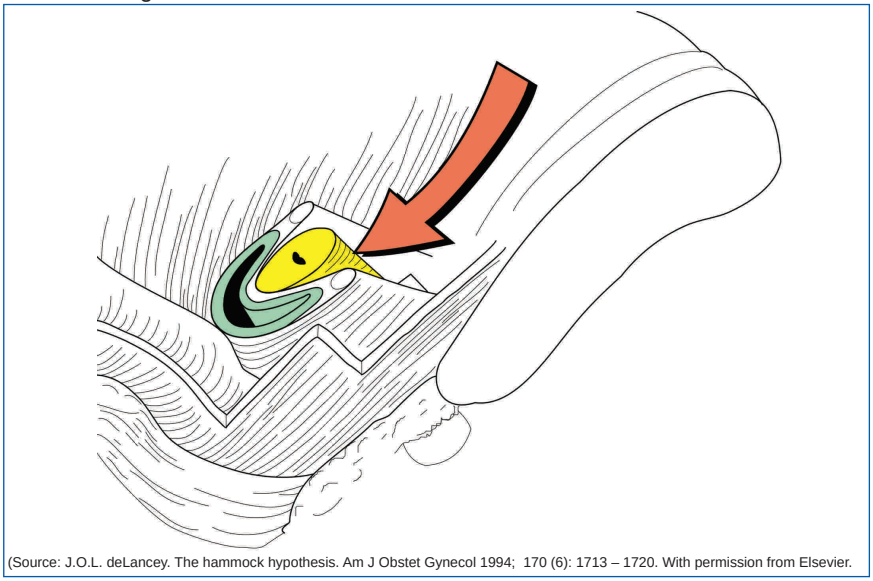
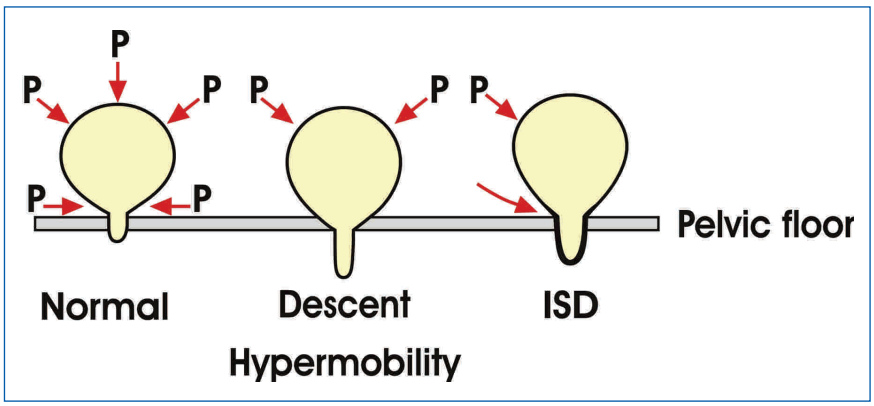


Figure 2: The Hammock hypothesis: The urethra is supported by the endopelvic fascia on the anterior vaginal wall. Raised intra- abdominal pressure compresses the urethra against the fascia.



(Source: J.O.L. deLancey. The hammock hypothesis. Am J Obstet Gynecol 1994; 170 (6): 1713 – 1720. With permission from Elsevier.

Figure 3: Enhorning theory: Raised intra abdominal pressure is transmitted to the proximal urethra. Hyper mobility. Intrinsic sphincter deficiency.



The urethra lies on the anterior vaginal wall, on a "hammock" of special connective tissue - the endopelvic fascia - which stretches from one pelvic side wall to the other and fulfils a vital supporting function to pelvic organs (Figure 2).

Previously it was thought that the position of the bladder neck above the level of the pelvic floor was important to continence.[4] Increased intra-abdominal pressure, acting on the bladder, was equally transmitted to the proximal urethra and bladder neck, thus sealing this area and preventing leakage. When the bladder neck prolapses below the level of the pelvic floor this protective effect is lost and leakage occurs. (Figure 3)

This theory has now been superceded by the so-called "Hammock hypothesis" [5] , which states that the supportive function of the endopelvic fascia underlying the urethra, and the musculature of the latter, are mainly responsible for continence. Lack of support through fascial tears and muscular weakness (denervation, stretching) leads to an inadequate continence mechanism and potential stress incontinence.

Radiation damage or scarring to the urethral wall through multiple surgical procedures, may also cause the classic "pipe-stem urethra", leading to leakage at low pressure, termed "intrinsic sphincter dysfunction." (See Figure 3)

Urodynamic stress incontinence is mostly a combination of both these mechanisms, with poor support usually the main culprit.

Common fallacies

A number of myths regarding SI need to be discarded from the outset.

1. Leakage on coughing is always SI.

The bladder is quite correctly said to be a poor witness. Symptoms, signs and the final diagnosis often do not correlate. "Stress incontinence" can be a symptom, a sign, or a condition. The latter would then be termed "Urodynamic Stress Incontinence" which is still commonly referred to as Genuine Stress Incontinence (and which is the subject of this series of articles).

The differential diagnosis of the sign 'stress incontinence' (ie. leakage on raised intra-abdominal pressure) is:

i) Overactive bladder / Urge incontinence
   This occurs when the patient coughs, the bladder is irritated and contracts, and the patient leaks. It manifests as a larger volume leakage with a slightly longer interval between cough and leak.
ii) Overflow incontinence
   Diabetics with neuropathy and large, flaccid bladders carrying significant residual urine volumes, can leak when coughing, thus "skimming off " part of this residual.
iii) Genuine (or 'Urodynamic') stress incontinence (GSI)
   Classically a small volume leakage, following immediately after an episode of increased intra-abdominal pressure.

2. Urodynamic testing before surgery is unnecessary

Surgery for GSI should never be performed if symptoms have not been confirmed by objective evidence thereof.

Urodynamic tests finalise the diagnosis and check on bladder function. They are vital before surgery to confirm GSI, hence the nomenclature "Urodynamic stress incontinence", to exclude unstable detrusor contractions (which could potentially affect the surgical outcome negatively) and to monitor bladder emptying (post-operative voiding difficulties could cause serious problems, as will be discussed later.) In an increasingly litiginous climate, urodynamics before incontinence surgery is vital. Table 1 summarises necessary tests and the specific information they provide.

It is also important for the family practitioner to have a basic understanding of what information these tests give.

Flowmetry measures the ability of the patient to empty her bladder. A low flow rate, with or without a high residual urine volume, would be a relative contra-indication to the performance of obstructive continence surgery.

Filling cystometry is a provocative test to determine whether the pressure of the detrusor muscle – which has high compliance – remains stable during filling. Involuntary contractions during filling and/or a rising baseline pressure during this phase, together with a subnormal bladder capacity, may indicate bladder instability or a neurogenic bladder. Bladder instability may seriously compromise the success of continence surgery.

Voiding cystometry confirms satisfactory bladder emptying and, by measuring detrusor pressures,

Table I : Urodynamics before surgery: Why?

TEST	INFORMATION
Filling cystometry	Shows unstable detrusor contractions Determines bladder capacity
Stress test	Confirms diagnosis of GSI
Voiding Cystometry / Flowmetry	Determines voiding efficiency and bladder contractility Flow rate Residual urine volume

can give an indication of where the problem lies if emptying is poor.

Occasionally, leak-point pressures are performed with the patient coughing after the bladder has been filled to a pre-set volume. This serves to confirm GSI and may also be an indicator as to which type of GSI is involved.

3. Pelvic floor muscle exercises (PFE's) are a waste of time.

Cash-strapped surgeons could favour surgery the knife as first line treatment as there is no mileage for them in PFE's, thus doing the patient a great disservice. All patients should first be offered PFE's by a trained pelvic floor physiotherapist, prior to surgery. Patients with GSI should not have incontinence surgery if their family is not yet complete as pregnancy and childbirth could potentially compromise the procedure. PFE's are ideal for these, mostly young patients.

In fact, it may take 6-8 months of a regular exercise programme to obtain optimal results, with lifelong continuation. If during such a programme there is no improvement within 8 weeks, further success is unlikely and surgery must be considered.[6] Many patients mistakenly think that they would have to these exercises many times a day. This is not true, since doing a specific set of exercises *correctly* a few times per week is sufficient. In fact, exercising the pelvic floor too frequently will cause muscle fatigue and be counter-productive. Patients are also often incorrectly told to 'pinch their urine stream' a few times on micturition. This certainly helps as a 'one-off' to identify the correct muscles, but done too often may lead to problems like dysfunctional voiding and urinary tract infection.

PFE's have a 50-70% overall success rate, depending on whether they are closely supervised or not. They should be performed lifelong after incontinence surgery to enhance the effect. There is also ample evidence that antenatal PFE's reduce the risk of developing GSI post-partum.[7]

It is important that the teaching of PFE's should be done by a physiotherapist specifically trained in treating pelvic floor dysfunction.

4. Hysterectomy causes GSI

That hysterectomy can cause disruption to the innervation of the pelvic floor and predispose to prolapse, is possible but as yet unproven. There is no conclusive proof that hysterectomy causes GSI.[8]

A recent study did show an increased occurence of urgency and urge incontinence in patients after hysterectomy.[9] This may be the result of a disruption of bladder innervation by the surgery. Another interesting prospective study could demonstrate no difference in the incidence of GSI in patients having subtotal hysterectomy versus those having total hysterectomy. [10]

The use of 'prophylactic' incontinence surgery together with hysterectomy must be discouraged in the strongest terms. The best chance of a lasting cure for GSI lies with the first procedure. Repeat procedures are far less successful.[11] Therefore there must always be objectively demonstrable GSI prior to embarking on an incontinence procedure.

5. Surgical cure of GSI is permanent.

Surgical cure rates have been studied by Jarvis [11] and are discussed again below. No incontinence procedure can ever have a 100%, lasting success rate. Many patients with GSI have inherently weak collagen tissue, surgical material fails and patients have health problems which continue to place strain on the pelvic floor (smoking, chronic bronchitis, obesity). In order to give themselves the best chance of a lasting cure, patients must make lifestyle changes and continue as long as possible with PFE's.

6. HRT helps for GSI

Unfortunately placebo-controlled studies have shown that this is not the case.[12] HRT does however help to prevent recurrent UTI's in the elderly and has a role in the treatment of overactive bladder.

Intravaginal, local estrogen therapy in the form of cream or pessaries does counter the effects of urogenital ageing, particularly atrophy, thus promoting a feeling of well-being. Given preoperatively for 1-2 months, it improves tissue handling during the vaginal approach to surgery. Estrogen may also relieve irritative symptoms.

Pre-referral responsibilities

The family practitioner should make a presumptive diagnosis and be able to write a clear and concise referral note. Urinary tract infection should be excluded, and treated if necessary, by taking a midstream urine specimen for culture by the laboratory.

It is very useful if the patient can produce a bladder diary where she indicates each time she urinates, and measures the volume.

Incontinence episodes should also be marked. This should be done day and night for three to four days.

An indication of daily fluid consumption should also be given. This is a valuable diagnostic adjunct and can also give a good indication of whether a patient adheres to a maximum recommended fluid intake of 2 to $2^1/_2$ litres not less than $1^1/_2$ litres per day.

A brief explanation of what to expect when urodynamic tests are ordered by the specialist should be given, as patients are often under the mistaken impression that this is a surgical procedure.

Urodynamic testing usually lasts for 30 – 40 minutes and involves the patient emptying her full bladder into a measuring receptacle (flowmetry). She is then catheterised with one or two fine- bore tubes transurethrally into the bladder, and another, transanally, into the rectum. This causes minimal discomfort and facilitates filling of the bladder, and pressure measurement. This test is called cystometry. When the bladder has been filled to capacity which takes 5-10 minutes a cough stress test is done to check for leakage, and the patient is then asked to empty her bladder (in privacy) with the catheters in situ. After the catheters have been removed, the computer provides the specialist with the measurements on a print-out, for interpretation. Patients should be encouraged to increase their fluid consumption for the next 2 – 3 days since there is a small (<5%) chance they may develop cystitis.

Summary

It should be clear that the run-up to specialist referral and pre-operative support are important phases in the management of the incontinent female patient by the family practitioner.

The duty of the practitioner is to be able to explain the nature of her problem to the patient, to allay her fears, and to give her adequate counselling as to what she might expect in the run-up to surgery. The basis of this is a sound knowledge of the pathophysiology of urinary incontinence, the ability to both take and evaluate a thorough history, to do a proper clinical examination and to conduct the appropriate side-room investigations.

In part 2 we will examine the spectrum of continence procedures and consider some of the sequelae which may confront the family practitioner in the short and long term.

See CPD Questionnaire p.53

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