Urinary and Fecal Incontinence: Preoperative Considerations

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3.1 Urinary Incontinence

Male urinary incontinence (UI) is a multifactorial disease. Details of the type of UI as severity and voiding symptoms usually allow to define whether the patients are affected by stress urinary incontinence (SUI), urgency urinary incontinence (UUI), or mixed urinary incontinence (MUI). Furthermore, patients with associated pain, hematuria, recurrent urinary tract infection (UTI) or with a history of prostate surgery or radiotherapy or suspected neurological disease need rapid referral to an appropriate specialist. In this way the patient should also be asked about medications and other diseases that may impact on symptoms of UI and medical history should be collected with the help of a voiding diary recording as follows:

- the amount of liquid he drinks
- frequency of micturition
- micturition volume
- frequency and amount of the leaks
- whether he felt a strong urge to go before leaking
- whether the leak occurred after a strain, or, coughing or sneeze
- how long the symptoms have been occurring

Symptom scores, symptom questionnaires and health-related quality of life (HRQoL) measures, validated for the language in which they are being used, may be useful to measure outcomes, but in men ICIQ-UI-SF score does not differentiate

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UI types, evidence on their sensitivity is inconsistent and there is no evidence that use of QoL or condition specific questionnaires have an impact on outcome of treatment. The European Association of Urology (EAU) recommends to use a validated and appropriate questionnaire when standardized assessment is required (Grade B).

Clinical examination is an essential part of assessment of men with UI. Abdominal examination allows us to detect a bladder overdistension or other abdominal mass, and perineal and rectal digital examination an enlarged prostate, changes in sensitivity and perineal and anal tone, a perineum descending, alterations of anal and bulbocavernosus reflexes. A cough test may reveal SUI if the bladder is sufficiently full.

Urinalysis and urine culture should be included in males with UI to rule out a urinary tract infection that may be asymptomatic or aggravate the symptoms.

Post-void residual, measured by catheterization or ultrasound, also if it is recommended the latter, is important because residual worsens symptoms and can cause urinary infections.

Urodynamic tests like multichannel cystometry with pressure/flow study, urethral pressure profilometry, Valsalva leak point pressure and videourodynamics, usually are performed to confirm diagnosis and predict treatment outcome. In spite of the widespread of use, these invasive tests, there are no RCTs, confirming their usefulness to predict outcome of surgery for incontinence after a radical prostatectomy. It is also uncertain if urodynamics will distinguish causes of incontinence, but can be used to rule out pure detrusor dysfunction, identify poor bladder compliance and confirm the diagnosis of intrinsic sphincteric deficiency.

The recommendations of EAU on the use of urodynamic examinations in patients are:

- Advise patients that the results of urodynamics may be useful in discussing treatment options, although there is limited evidence that performing urodynamics will predict outcome of the treatment for uncomplicated urinary incontinence.
- Perform urodynamics if the findings may change the choice of invasive treatment (GR B).
- Do not use urethral pressure profilometry or leak point pressure to grade severity of incontinence or predict the outcome of treatment (GR C)
- Clinicians should:
  - ensure that the test replicates the patient's symptoms;
  - interpret results in the context of the clinical problem;
  - check recordings for quality control;
  - remember there may be physiological variability within the same individual.

Pad test is usefulness in quantifying severity of urinary incontinence and selecting the ideal candidate for periurethral bulking agents. Furthermore, change in leaked urine volume on pad test can be used to measure treatment outcome. There are two versions of pad test, the short-term, performed for 1 h in clinic and the long-term pad test, performed for 24 h at home. There is no evidence that one type is superior to another, but 24-h pad weights have been shown to be superior and are considered the gold standard for objective measurement of urinary incontinence. Previous authors have categorized incontinence into three categories: mild if <100 g/24 h, moderate if 100–400 g/24 h and high-grader if >400 g/24 h. Variation in activity level can lead to

significant differences in 24-h pad weights: changes greater than 100 g can be seen in patients who have different physical activity during the day.

Urethrocystoscopy can be useful to verify the state of the sphincter, the ability to contract it voluntarily and its occlusion compressing and lifting the perineum.

There is a general consensus that magnetic resonance imaging (MRI) provides good global pelvic floor assessment; however, there is a large variation in MRI interpretation between observers and little evidence to support its clinical usefulness in the management of urinary incontinence.

De Lancey and coworkers in a pilot study on functional and anatomical differences between continent and incontinent men post-radical prostatectomy on urodynamics and 3T MRI conclude that men with PPI were not able to increase urethral pressure with a Kegel maneuver despite similar resting urethral pressure profiles. Additionally, incontinent men had shorter urethras and were more likely to have distortion of the sphincter area. All suggesting that the sphincter in men with PPI is both diminutive and poorly functional. However, De Lancey and coworkers in an evaluation with dynamic MRI of urethral hypermobility post-radical prostatectomy assert that there are no statistically significant differences in bladder neck and urethral position or mobility on dynamic MRI evaluation between continent and incontinent men.

The evidences of the EAU guidelines on the use of imaging (ultrasound and MRI) in the diagnosis of urinary incontinence in men are:

- Imaging can reliably be used to measure bladder neck and urethral mobility, although there is no evidence of clinical benefit for patients with urinary incontinence (LE 2b).
- There is no consistent evidence that bladder (detrusor) wall thickness measurement is useful in the management of urinary incontinence (LE 3).

So the EAU guidelines recommendation is: "Do not routinely carry out imaging of the upper or lower urinary tract as part of the assessment of urinary incontinence (GR A).

Interdisciplinary Comment

The steps that constitute the diagnosis of urinary incontinence in the male are indispensable and in this context the videourodynamics represents an inalienable investigation that allows us to objectivate the presence of the sphincter insufficiency.

As described by Frasson, clinical conditions leading to anal (when the patient is incontinent just to gas, and is able to contain liquid and solid stool) and fecal incontinence are very numerous. Any of the factors that allow continence and defecation may be involved in the disease. The diagnosis is therefore extremely important: sphincters, rectal compliance, anorectal sensitivity, colonic transit time, characteristics of the stool, mental attention, manual and walking capabilities, and so on, must be evaluated together with his quality of life. There is not, like for urodynamics, a single diagnostic test suggesting us the best treatment: the patient must be fully investigated and really considered a person before just a patient.

3.2 Fecal Incontinence

Faecal incontinence is a debilitating disease with an enormous impact on quality of life, and with several social, economic and medical implications [1]. The International Continence Society stated that 'anal incontinence (AI) is the involuntary loss of flatus, liquid or solid stool that is a social or hygienic problem', while faecal incontinence is 'the involuntary loss of liquid or solid stool that is a social or hygienic problem'. The reluctance of patients to admit symptoms of AI or FI makes it difficult to establish their true prevalence, which in the literature is reported at about 2–17% in the general population [2]. It is likely that this wide range can be linked to a mis-classification of the most important etiological factor of incontinence. The aetiology and pathophysiology of incontinence in men are different than in women [3], while the severity of symptoms and their impact on quality of life are almost comparable between the genders. Faecal continence is a multifactorial function that involves anal sphincters, anal and rectal sensitivity, rectal compliance, faecal consistency, anal and rectal innervation. Commonly, AI and FI are caused by more than one pathophysiological alteration at the same time [4]. The pathogenic factor could be a simple or complex structural defect or disruption of the anal sphincter, although a weak but intact sphincter due for example to diabetes, denervation of pudendal nerves or other neurological disorders, spinal trauma, inflammatory bowel disease, rectal prolapse, primary muscle degeneration, could cause the same symptoms. This variety of etiological factor (Table 3.1) makes a misdiagnosis

Table 3.1 Causes of faecal incontinence [6]

Structural abnormalities	
Anal sphincter	Haemorrhoidectomy, anal dilation, radiation, inflammatory bowel disease
Rectum	Prolapse, hypersensitivity/hyposensitivity, neoplasms, congenital abnormalities, excessive perineal descent
Puborectalis muscle	Trauma
Pudendal nerve	Surgical injury, excessive perineal descent
Central nervous system, spinal cord, autonomic nervous system	Spinal cord injury, head injury, stroke, back surgery, diabetes mellitus, multiple sclerosis, tabes dorsalis, cauda equina injury or tumour
Functional abnormalities	
Anorectal sensation	Central nervous system/autonomic nervous system injury, diabetes mellitus, inflammatory bowel disease
Faecal impaction	Dyssynergic defecation
Stool characteristics	
Volume and consistency	Inflammatory bowel disease, irritable bowel syndrome, medications, infections
Irritants	Bile salt malabsorption, laxatives
Hard stools and retention	Dyssynergic defecation, faecal impaction, medications
Other	
Physical mobility and cognitive function	Aging, disability, dementia, sedation
Psychosis	Wilful soiling

easy, as it is, for example, reported with incontinence due to childbirth since the inability of a proper diagnosis occurs in 87% of midwives, 28% of young doctors, 14% of physicians, compared to 1% of experienced clinicians [5].

The diagnosis of the true cause of incontinence is of the greatest importance in the planing of an appropriate medical therapy, thus a proper training is critical to allow an undiagnosed or misclassified etiological factor to be correctly diagnosed. Moreover, equally essential is the differential diagnosis of incontinence and pseudoincontinence, which is a medical condition that mimics incontinence symptoms [6–8].

It is mandatory that physicians perform a full assessment of patients including medical history, general physical examination and proctological examination, instrumental studies, with the aim to fully outline incontinence's characteristics and thus provide important tips about future therapies (Table 3.2).

A thorough history represents the first step of the clinical evaluation. The medical history must not be focused only on AI, but rather on retrieving all of the patient's medical information concerning systemic disorders and co-morbidities as urinary incontinence, previous surgery (urological surgery, proctological surgery or oncological surgery), spinal injuries, trauma, drugs and lifestyle [3, 4, 6]. Furthermore, the patient should be interviewed on bowel habit and on bowel care including diet, fluid intake and laxatives, and how these influence AI. Until recently, incontinence was underreported in men, as it was thought to be mainly a childbirth-related dysfunction. Literature's data have actually shown that the incidence of incontinence and its impact on quality of life are quite similar between the genders. Nevertheless, women are more likely to talk about this topic and seek help for symptoms, as incontinence causes severe restriction both in sexuality and in sexual activity mostly in women [3]. The symptoms experienced by the patient must be deeply investigated to rule out every other condition that causes soiling or incontinence (e.g. fistulas, external haemorrhoids, anal or low rectal tumours). If the patient describes an

Table 3.2 History and physical examination for faecal incontinence [6]

History	Onset, duration and pattern of symptoms
	Stool consistency
	Associated symptoms: Urgency, lack of sensation of stool passage, urinary incontinence
Medical history	Diabetes mellitus, multiple sclerosis, radiation treatment, dementia
Surgical history	Haemorrhoidal surgery
	Perianal surgery
	Bowel resection
	Cole
Medications	Psyllium fibre, antibiotics, proton pump inhibitors, etc. (see text)
Physical examination	Perianal scars, fistulae, fissures, skin irritation
	Haemorrhoids, anal skin tags, prolapse
	Anocutaneous reflex (anal wink)
	Digital rectal examination—resting and squeezing anal sphincter tone, masses
	Sensation intact? (i.e. aware of urge to defecate on rectal examination; anal sensation)

Table 3.3 Types of anal incontinence

Type	*Description*	*Defect*
Flatus incontinence	Incontinence of flatus due to inability to differentiate gas from solid or liquid	Internal anal sphincter
Passive leakage	Involuntary soiling or discharge of liquid or solid stool without patient awareness	Internal anal sphincter
Urge incontinence	Inability to retain faeces as long as needed to find a toilet once the need to defecate is perceived	External anal sphincter

Table 3.4 The Wexner Score [9]

	Frequency				
Type of incontinence	Never	Rarely	Sometimes	Usually	Always
Solid	0	1	2	3	4
Liquid	0	1	2	3	4
Gas	0	1	2	3	4
Wears pad	0	1	2	3	4
Lifestyle alteration	0	1	2	3	4

Never, 0; rarely, <1/month; sometimes, <1/week; ≥1/month; usually. <1/day, ≥1/week; always, ≥1/day
0, perfect; 20, complete incontinence

AI only for liquid stool, then a colonic cause of diarrhoea should be excluded. If an AI is present, it must be differentiated as a flatus incontinence, passive leakage or urge incontinence (Table 3.3), never forgetting that an overlapping between these conditions is always possible.

Keeping a daily incontinence diary is essential to clarify the characteristics of incontinence such as the timing, amount, pattern, duration and need of pads. Hence, the severity of AI can be graduated as (a) minor, if incontinence happens less than once a month; (b) moderate, if incontinence to solids happens more than once a month or to liquids more than once a week; and (c) severe, when incontinence to solids and/or liquids happens daily or several times a week. All these characteristics can be better classified with grading systems such as the Wexner score system (Table 3.4) or the American Medical Systems (AMS) score (Table 3.5), which allow one to use an objective parameter to evaluate AI, to verify the response to therapy and to follow up its evolution.

It is also important to interview the patient on the impact of incontinence on the quality of life, satisfaction, needs, restrictions, anxiety and/or decreased mood, sexual dysfunction and on how AI influences them. Questionnaires such as the SF-36, FIQoL or others are critical to outlining these characteristics [4, 7, 11–13].

The proctological examination should start from the inspection of the perineum and anus, checking their integrity and looking for scars from previous surgery, a keyhole deformity of the anus suggesting a sphincter defect, or just for irritation or

Table 3.5 The American Medical Systems (AMS) score [10]

Over the past four weeks, how often	*Never*	*Rarely*	*Sometimes*	*Weekly*		*Daily*	*Several times daily*
Did you experience accidental bowel leakage of gas?	0	1	7	13	19	25	
Did you experience minor bowel soiling or seepage?	0	31	37	43	49	55	
Did you experience significant accidental bowel leakage of liquid stool?	0	61	73	85	97	109	
Did you experience significant accidental bowel leakage of solid stool?	0	67	79	91	103	115	
Has this accidental leakage affected your lifestyle?	0	1	2	3	4	5	

Several times daily, >1 episode a day; daily, 1 episode a day; weekly, 1 or more episodes a week but <1 a day; sometimes, >1 episode in the past four weeks but <1 a week; rarely, 1 episode in the past four weeks; never, 0 episodes in the past 4 weeks

excoriation of the skin due to soiling. Moreover, during the inspection one should ask the patient to strain in order to check the presence of a descending perineum or of mucosal, haemorrhoidal or full-thickness rectal prolapse. Then, the digital rectal examination verifies the sphincter tone at rest (indicative of internal anal sphincter function), in contraction (indicative of external anal sphincter function) and during squeezing, the latter to check the function of the puborectalis muscle, which with squeezing should push the examiner's finger anteriorly. Moreover, the rectal examination can highlight a rectal mass, which can suggest a cancer. Asking the patient to cough will result in an external sphincter contraction, thus checking the anal sphincter reflex. The rectal examination may show an asymmetry of the sphincter suggesting a regional defect. Finally, a proctoscopy and a rectosigmoidoscopy with a rigid instrument must be done to complete the proctological visit.

(a) *Transanal ultrasonography* [14]: Transanal ultrasonography is central to the study of the ano-rectal canal, the internal and external sphincter, the puborectalis muscle and the levator ani muscle, their morphology and any damage, if present, in order to plan therapies. Usually, the assessment of the anorectum is completed with a tridimensional endoanal ultrasound (*3D-EAUS*) and a perineal ecography. Specific scores define the severity of the sphincter damage (Table 3.6). The endoanal ultrasound can recognize and sharply describe many of the following parameters such as the presence of damage of the internal or of the external anal sphincter or of a combined lesion of both, the presence of dam-

Table 3.6 Ultrasonographic scoring system to define the severity of sphincter lesion [14]

Defect characteristic	Score 0	Score 1	Score 2	Score 3
Internal sphincter defect				
Length	None	Half or less	More than half	Whole
Depth	None	Partial	Total	–
Size	None	≤90°	91–180°	> 180°
External sphincter defect				
Length	None	Half or less	More than half	Whole
Depth	None	Partial	Total	–
Size	None	≤90°	91–180°	>180°

Table 3.7 Anorectal manometry parameters

1	Resting anal sphincter pressure
2	Rectal sensory thresholds for first sensation, urge and maximum tolerated threshold
3	Rectal pressure on strain and concomitant anal relaxation or paradoxical contraction
4	Maximum anal sphincter squeeze pressure and duration of maximum anal squeeze pressure (sustained squeeze)
5	Anal pressure on cough
6	Balloon expulsion recorded as time taken to expel a party balloon tied at the end of a section of intravenous tubing and inflated with 50 mL of warm water, from the rectum, while seated on a private toilet

age of the puborectalis muscle, the number and site of damages if these are more than one, the presence of scars, the characteristics of the muscles and of all the other layers (echogenicity, thickness, vascularisation).

To note, sometimes patients have a sphincter lesion without any clinical symptoms of AI, while other patients with AI have no evidence of any damage to the muscle but actually have an atrophic sphincter or the manifestation of a pudendal neuropathy.

(b) *Electromyography (EMG)*: The integrity of or damages to the external sphincter, if present, can be studied by both the single and the concentric needle EMG. Moreover, EMG shows the changes in the electrical activity of the sphincter and of the levator ani muscle due to contraction. Nowadays, its role in the diagnosis of AI's aetiology has been replaced by ultrasound.

(c) *Pudendal nerve terminal motor latency (PNTML)*: Its aim is the study of the time to contraction due to a stimulation to the pudendal nerve. Usually PNTML is prolonged in patients with AI, but the symptoms are not directly proportional to its value. Nowadays, it is rarely used in the diagnostical setting because of this low correlation with symptoms [11, 12].

(d) *Anal manometry*: This exam is a diagnostic test with high specificity and sensitivity in AI diagnosis. It shows many characteristics of the sphincters and of the rectum (Table 3.7). First, it shows the anal sphincters' pressure at rest. Second, it studies the rectal perception of the faecal mass that is distending its wall. This is pointed out by the following parameters: (a) the lowest volume that evocates the first sensation, (b) the volume at need to defecate, and (c) the maximum volume

Fig. 3.1 Multi-Functional Anoscope (MFA—Courtesy of Sapi Med, Alessandria, Italy): an anoscope with a balloon that can be used to measure rectal sensitivity and compliance

tolerated. Third, it describes the rectoanal inhibitory reflex—RAIR—which is the inhibition of the internal anal sphincter tone due to a distension of the rectum. Fourth, it studies the rectal compliance, which is the adaptation of rectum to the incoming stool. This is pointed out by the analysis of the value at rest (showing the tonic function of both the internal and external anal sphincters), or the value during voluntary contraction, Valsalva or cough (external anal sphincter function). Usually, patients with AI have a low resting pressure (defect of the internal anal sphincter), a low squeeze pressure and a low duration of squeezing time (external anal sphincter dysfunction → inability to suppress defecation). Looking at men, the literature describes a longer sphincter length and on the contrary a higher anal squeeze pressure. These data are likely to be link to sexual differences. Moreover, men if compared to women have higher anal resting and squeezing pressures, and the likelihood of a shorter duration of sustained squeeze is lower than in women [3]. An alteration of the rectal sensation may contribute to AI by a misunderstanding of the presence of stool and of the need to defecate. Urge AI could be linked to a decrease in rectal compliance, which may cause an increased frequency of defecation and a rapid transit of stool through the rectum.

Even if manometry is a test with high specificity and sensitivity in AI diagnosis, its clinical utility is limited by the low standardisation of the procedure and because in the differential diagnosis of continent and incontinent patients, it is not as much sensible and specific [1, 11, 12, 15].

(e) *Balloon rectal test*: It is a useful test to check rectal sensitivity and compliance quickly. A balloon (Fig. 3.1) is placed in the rectum to mimic the presence of

Table 3.8 Values of the parameters checked with the inflation of an endorectal balloon

Parameters	Normal value
First sensation	30–60cc of air or fluid
Defaecatory desire volume	60–160cc of air or fluid
Maximum tolerable volume	160–270cc of air or fluid
Pain	>270

Fig. 3.2 Digital dynamometer PRAP2000 with solid disposable sphere (Courtesy of Sapi Med, Alessandria, Italy)

Table 3.9 Normal value checked with the solid sphere test

Parameters	Normal value
Voluntary contraction	1000–1200 g
Baseline	200–400 g
Ejection	Ideally 0 g or anyway less than at baseline

stool by its gradual inflation. The inflation of air or fluid allows to measure the volume of the following items (Table 3.8): (1) first sensation; (2) desire to defecate; (3) urgency to defecate; and (4) pain. Usually, in incontinent patients, these values are lower than in the general population (rectal hypersensitivity). Higher values indicate rectal hyposensitivity.

(f) *Solid sphere test* [16–18]: This test studies the rectal sensitivity on outpatients. A solid sphere attached to a digital dynamometer (Fig. 3.2) is introduced into the anorectum. The withdrawal of this sphere out of the anorectum made the dynamometer quantify which is the resistance of the sphincters to sphere's extraction. As the sphere is pulled out, the dynamometer will check the following parameters: (a) first, the patient will contract the sphincter trying to stop the ball extraction → voluntary contraction phase; (b) second, the patient is asked to strain to eject the sphere as quick as possible → ejection phase; (c) third, the sphere is pulled out with the patient at rest → baseline phase (Table 3.9). This test allows us to differentiate the internal sphincter's activity at rest from the external sphincter's activity during contraction. Moreover, it allows for the evidence of a paradoxical contraction or a failure of relaxation of the puborectalis muscle when the patient is asked to strain and the dynamometer shows a value as high as that on voluntary contraction or near to this.

Fig. 3.3 Artificial Blue Stool (ABS): from left to right the low, the medium and the high density blue gel (Courtesy of Sapi Med, Alessandria, Italy)

(g) *Artificial Stool*: The aim of this test is to check the patient's ability to retain faeces by filling the rectum with a blue gel that mimics stool (Fig. 3.3). This gel is available in three different densities: high, medium and low density. The exam is started with the high-density gel. Once the rectum is filled with this gel, the patient is asked to do some physical activity (e.g. walk or climb stairs) and then checked for any incontinence: if the result is negative, the patient undergoes a stress test with a small enema. If no incontinence happens, the patient will be checked with the medium-density gel as described earlier and, if needed, with the low-density one. The test is useful to compare the results after therapy.

Interdisciplinary Comment

The aetiology of faecal incontinence is multifactorial. An accurate patient evaluation is necessary to individualise the dysfunction. In this way, medical history, general physical examination and proctological examination and instrumental studies may help plan the correct treatment.

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