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TERMINOLOGY

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An International Continence Society (ICS) report on the terminology for female pelvic floor fistulas

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Abstract

Introduction: The terminology for female pelvic floor fistulas (PFF) needs to be defined and organized in a clinically based consensus Report.

Methods: This Report combines the input of members of the International Continence Society (ICS) assisted at intervals by external referees. Appropriate core clinical categories and a sub-classification were developed to give a coding to definitions. An extensive process of 19 rounds of internal and external review was

Judith Goh, Lauri Romanzi, Sohier Elneil (Production and Content) and Bernard Haylen (Production, Content and Mentor) are equal first authors.

Bernard Haylen: Standardization Steering Committees ICS (ICS Working Group on the Terminology for Pelvic Floor Fistulas).

[Correction added on 29 October 2021, after first online publication: The authorship list, correspondence, footnotes, and disclosures have been updated in this version.]

involved to examine each definition, with decision-making by collective opinion (consensus).

Results: A terminology report for female PFF, encompassing 416 (188 ***NEW***) separate definitions, has been developed. It is clinically based with the most common diagnoses defined. Clarity and user-friendliness have been key aims to make it interpretable by practitioners and trainees in different specialty groups involved in female pelvic floor dysfunction and PFF. Female-specific imaging (ultrasound, radiology, and magnetic resonance imaging) and conservative and surgical PFF managements as well as appropriate figures have been included to supplement and clarify the text. Interval (5–10 years) review is anticipated to keep the document updated and as widely acceptable as possible.

Conclusion: A consensus-based terminology report for female PFF has been produced to aid clinical practice and research.

KEYWORDS

Female urinary incontinence, Pelvic Floor Fistula, Pelvic reconstructive surgery

1 | INTRODUCTION

Fistula (Latin: fistula—"*pipe, tube*") refers to an abnormal or surgically made connection between a hollow or tubular organ and the body surface, or between two hollow or tubular organs. The plural noun may be either fistulas or fistulae - fistulas will be used.

Pelvic floor fistula (PFF) refers to a fistula affecting the upper or lower genital tract including the uterus, cervix, vagina, and/or the different vaginal compartments and the neighboring organs such as the upper and lower urinary tract (ureter, bladder, and urethra) and lower bowel (distal colon, rectum, and anus). The term genital tract fistula (GTF) should not be used. A diagnosis of PFF fits the established model of symptoms corroborated by clear clinical signs and commensurate evaluation test results, starting with a woman having urinary or fecal incontinence symptoms, usually per vagina.

There is currently no single document encompassing all elements required for diagnoses in female PFF that includes a full outline of the terminology for symptoms, clinical examination signs, and diagnostic investigations. It would also encompass etiology, classification, and terminology for the different nonsurgical and surgical treatment modalities.

Core terminology documents that will be referenced are (i) 2010 IUGA-ICS Joint Terminology Report on Female Pelvic Floor Dysfunction[1] and (ii) the equivalent 2019 Male Terminology for Lower Urinary Tract and Pelvic Floor Dysfunction (with its greatly expanded range of definitions).[2] Also referenced will be the 2016 IUGA-ICS Joint Terminology Report on Pelvic Organ Prolapse[3] and the World Health Organization's fistula publication.[4,5] An original aim of the IUGA-ICS Joint Terminology reports[1,2] has been to provide a general terminology, forming the "core" terminology to which more specific terminologies can be attached. Reference will also be made to three other published Standardization Reports[6–8] and six joint IUGA-ICS Female Terminology Reports.[9–14]

No standardization document exists on female PFF, though work by groups in the field including the International Society of Obstetric Fistula Surgeons, the World Health Organization International Classification of Disease System, and the International Obstetric Fistula Working Group at the United Nations Population Fund (UNFPA) have defined segments of PFF terminology that were reviewed pursuant to the creation of this document.[15] To devise this first PFF standardization document, the PFF Working Group reviewed all available published documents that used a clinical framework to develop terminology incorporating fistula aetiologies, symptoms, signs, staging and classifications, investigations, diagnoses, and treatments. By including concurrent and subsequent pelvic floor disorders, this document functions as a patient-centered terminology resource that reflects frameworks for cost-effective service integration.[16,17]

Female-specific imaging advances in urodynamics (UDS), video-endoscopic images, ultrasound, radiology, and magnetic resonance imaging (MRI) have been commonly used by surgeons in well-resourced settings and are increasingly available to surgeons in resource-constrained settings across sub-Saharan Africa and South and Southeast Asia. The indications for imaging in PFF and the utility of multi-channel urodynamics (MUDS) in the evaluation and management of women with lower urinary tract

symptoms (LUTS) after successful urinary tract fistula closure or LUTS concurrent with rectovaginal fistula will be illustrated in this terminology document.

The terminology document defines methods for nonsurgical treatment of fistula with catheter, debridement, and fulguration. This report acknowledges that PFF may not occur in isolation but may be associated with pelvic organ prolapse (POP)[18–21] and voiding, defecatory and/or sexual dysfunctions and/or other pelvic floor dysfunction, and/or other diagnoses of musculoskeletal, renal, reproductive, and mental health aetiologies.

As with all ICS Terminology documents, this terminology report collates the definitions of PFF terms, that is, "the technical or special terms or expressions used in a business, art science or special subject" or "nomenclature in a field of study."[22] Emphasis will continue the ICS tradition of terms in current use in the relevant peer-reviewed literature. The aim is to assist clinical practice and research. Some new and revised terms have been included. Explanatory notes on definitions have been referred, where possible, to the "Endnotes" section.

This document aims to comprehensively cover all terminology for PFF management (i) for any etiology (including congenital, obstetric, and iatrogenic); (ii) for management anywhere in the world (though we realize there will be vast differences in access to investigations and other resources); (iii) inclusive of intercurrent pathology (e.g., POP); (iv) inclusive of the latest update of ICS terminology on lower urinary tract dysfunctions,[2] (so there is no need for the reader to seek additional documents). It is all included in the current document.

Like all the other joint ICS female-specific terminology reports, every effort has been made to ensure this report is:

(1) *User-friendly*: It should be able to be understood by all clinical and research users.

(2) *Clinically based*: Symptoms, signs, and validated assessments/investigations should be presented for use in forming workable diagnoses for PFF and associated dysfunctions. Sections 1–6 will address etiology, classification, symptoms, signs, and investigations and imaging for PFF and associated diagnoses. Radiologic investigations including MRI and computerized tomography (CT) have also been incorporated. Section 7 will address fistula diagnoses, possible fistula-related diagnoses and common comorbidity diagnoses. Sections 8 and 9 will list the terminology for conservative and surgical treatments of PFF.

(3) *Origin*: Where a term's existing definition (from one of the multiple sources used) is deemed appropriate, that definition will be included and duly referenced. Many terms in female pelvic floor prolapse and dysfunction, because of their long-term use, have now become generic, as apparent by their listing in medical dictionaries. The terms used in PFF will be defined for the first time in this document.

(4) *Able to provide explanations*: Where a specific explanation is deemed appropriate to describe a change from earlier definitions or to qualify the current definition, this will be included as an addendum to this paper (Endnotes 1, 2, 3, etc.). Wherever possible, evidence-based medical principles will be followed (Table 1).

It is suggested that acknowledgment of these standards in written publications related to female PFF, be indicated by a footnote to the section "Methods and Materials" or its equivalent, to read as follows: "Methods, definitions and units conform to the standards recommended by the International Continence Society, except where specifically noted."

2 | SECTION 1: ETIOLOGY

The etiology of a PFF can be many and varied, including both congenital and acquired causes. To further clarify etiology as currently used within the academic fistula surgeon community of practice, aetiologies are further stratified into two groups based on whether the fistula is related to childbirth, or not related to childbirth. Congenital causes define etiology across the urinary, genital, and anorectal tracts. Acquired causes include obstetric, iatrogenic, mixed obstetric-iatrogenic, traumatic, inflammatory, infection-based, and fistulas caused by cancer.

1.1 Childbirth related

1.1.1 Obstetric fistula (OF): Due to prolonged obstructed labor with a fistula from the urinary tract and/or anorectal tract to the genital tract caused by ischemia and necrosis. ***NEW***

1.1.2 Iatrogenic childbirth-related fistula (ICRF): Directly due to injury to urinary tract/anorectal area during operative delivery (cesarean section/cesarean hysterectomy or instrumental delivery including episiotomy). ***NEW***

1.1.3 Mixed obstetric and iatrogenic fistula (MOIF): Related to operative delivery for prolonged obstructed labor. ***NEW***

1.1.3.1 Tissue integrity already compromised by obstructed labor before operative delivery. ***NEW***

1.2 Non-childbirth related

1.2.1 Congenital fistula (ConF): Fistula present from birth. ***NEW***

1.2.1.1 Hypospadias: Opening of the urethra other than at the site of the external urinary meatus. For example, low- or mid- vaginal. ***NEW***

1.2.1.2 Ectopic ureter: Ureter terminating at a site other than the bladder. ***NEW***

1.2.1.3 Total perineal defect of genital tract:* Absent perineal body. ***NEW***

1.2.1.4 Imperforate anus with spontaneous rectovaginal rupture of anorectal tract: Rectovaginal

fistula caused by pressure in the rectum due to an imperforate anus. ***NEW***

1.2.2 Iatrogenic fistula (IF): PFF occurring after non-obstetric pelvic procedures/surgery. ***NEW***

1.2.3 Traumatic fistula (TF): Due to trauma to the genital tract such as pelvic crush/impalement injury, sexual violence, female genital tract cutting, insertion of vaginal foreign materials (packing with herbs/stones/salt/foreign bodies). ***NEW***

1.2.4 Inflammatory fistula (InF): Due to inflammatory conditions such as inflammatory bowel disease (e.g., Crohns, ulcerative colitis). ***NEW***

1.2.5 Infection-related fistula (IxF): Due to infections/abscess (e.g., tuberculosis, schistosomiasis, infectious breakdowns of obstetric perineal trauma, perianal abscess). ***NEW***

1.2.6 Cancer-related fistula (CF): Due to tissue compromise from malignancy or from treatment of malignancy such as radiation therapy or surgery. ***NEW***

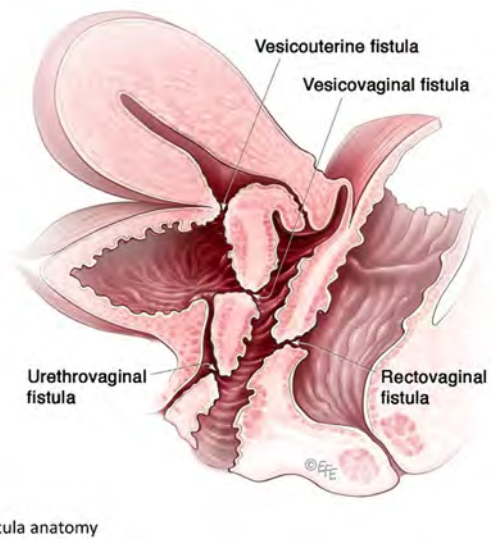

FIGURE 1 Basic pelvic floor fistula anatomy. © Levent Efe

3 | SECTION 2: CLASSIFICATION

No consensus on a classification system for female PFF exists[23] (current proposed classification systems are outlined in the endnotes of this section). Terms outlined below will denote the proximal/distal locations along the urinary, colorectal, and genital tracts and site-specific categories (e.g., urethro-vaginal fistula [UVaF]). Fistulas may, however, be large, straddle both proximal/distal locations and involve more than one anatomical site. More than one fistula may be present. The amount of scarring and residual tissue present (for surgical purposes) will be variable. The fistula may also be described by its anatomical location and antecedent event (e.g. obstetric, iatrogenic, combined).

2.1 Basic categories of PFF

The following terms are defined, each in relation to the hollow organ system component involved in the fistula defect (Figure 1). These are localizing/descriptive terms and not a classification system as such. The following acronyms will be used: F (fistula); V (bladder/vesico); U (urethra); Va (vaginal); Vt (vaginal vault); Ut (uterine); Cx (cervical); Ur (ureteric); R (rectal); Co (colon); Pe (perineal); AC (ano-cutaneous).

2.1.1 UVaF: Abnormal connection between the urethra and the vagina. ***NEW***

2.1.2 Vesico-vaginal fistula (VVaF): Abnormal connection between the bladder and the vagina. ***NEW***

2.1.3 Vesico-uterine fistula (VUtF): Abnormal connection between the bladder and the uterus. ***NEW***

2.1.4 Uretero-vaginal fistula (UrVaF): Abnormal connection between the ureter and the vagina. ***NEW***

2.1.5 (Colo)-recto-vaginal fistula (RVaF): Abnormal connection between the rectum (colon) and the vagina. ***NEW***

2.1.6 (Colo)-rectal to urinary tract: Any abnormal connection between the rectum (colon) and any part of the urinary tract, without vaginal involvement. ***NEW***

2.2 UVaF

2.2.1 Partial UVaF: Urethral structure is evident, with a demonstrable fistula defect (Figure 2). ***NEW***

2.2.2 Total UVaF: Urethral structure is not evident (Figure 3). ***NEW***

2.2.3 Circumferential fistula (genito-urinary): An entire segment (anterior, posterior, lateral urethra) from the anterior vaginal wall to the posterior aspect of the pubic symphysis is absent and destroyed.[23,24] The circumferential fistula almost always involves the urethra and the fistula totally separates the proximal urethra/bladder from the distal portion (Figure 4). Bladder involvement with a circumferential fistula is common. ***NEW***

2.3 VVaF

2.3.1 VVaF: Fistula affecting anterior vaginal wall and posterior bladder wall with or without involvement of the ureteric orifices (Figure 5A,B). ***NEW***

2.3.2 Circumferential fistula (genito-urinary): See 2.2.3. It almost always involves the urethra. ***NEW***

2.3.3 Vesico-vaginal vault fistula (VVtF): VVaF located at vaginal vault (cuff) following hysterectomy (Figure 6A,B). ***NEW***

2.4 VUtF

2.4.1 Vesico-cervical fistula (VCxF): Abnormal connection between the bladder and the cervix. May occur after cesarean section, procedures to the cervix, supra-cervical hysterectomy. ***NEW***

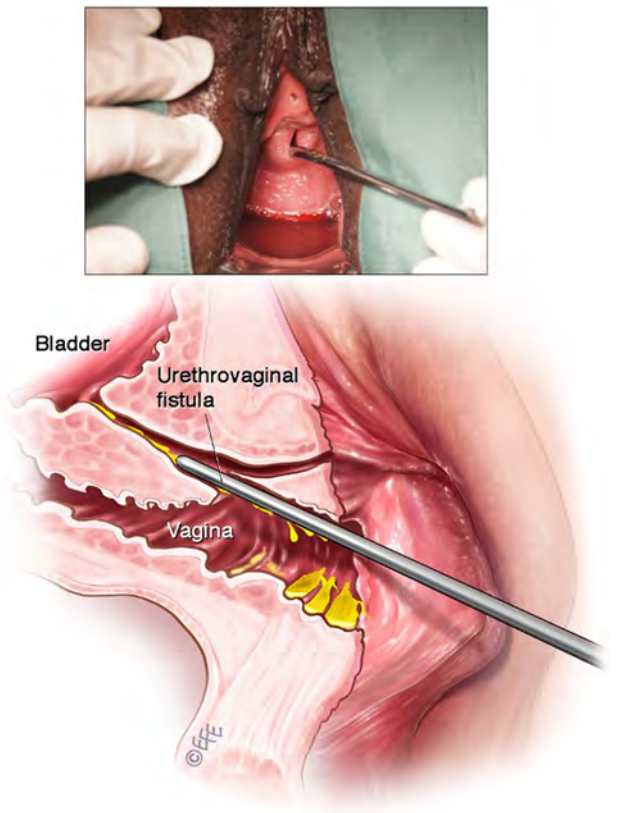

FIGURE 2 Urethro-vaginal fistula (UVaF) demonstrated by metal catheter—1 cm above the external urethral meatus. © J Goh (above) © Levent Efe (below)

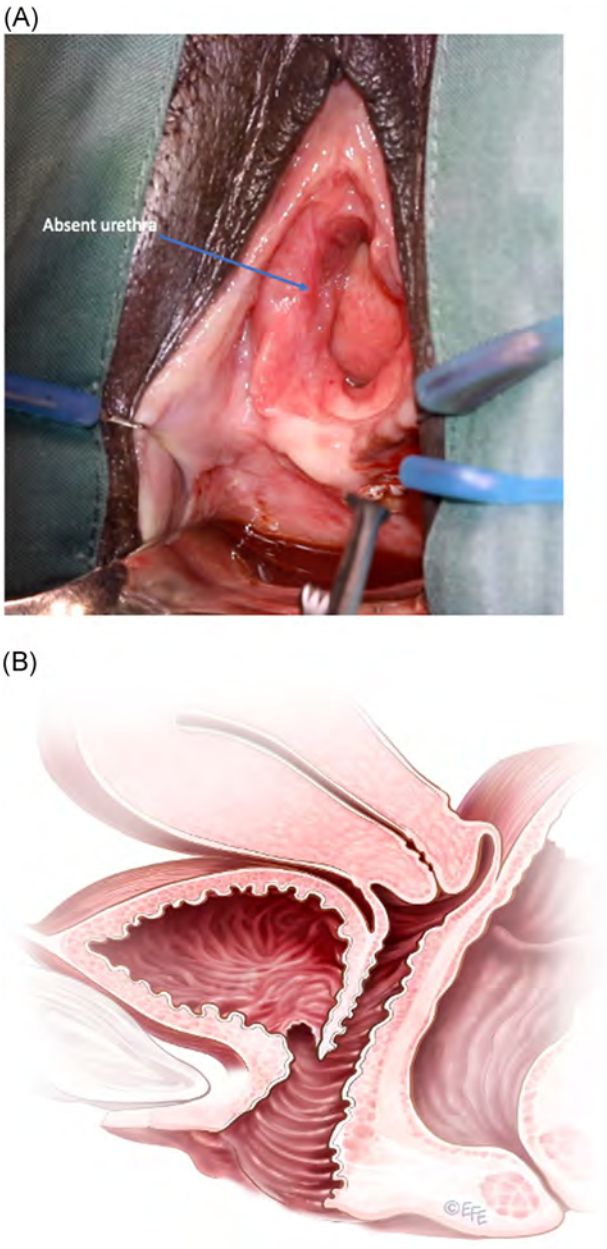

FIGURE 3 (A, left) Total urethro-vaginal fistula (UVaF)—Total absence of anterior vaginal wall and posterior urethra from external urinary meatus to bladder neck. © J Goh. (B, right) © Levent Efe

2.4.2 VUtF: Abnormal connection between the bladder and the body of the uterus. ***NEW***

2.5 UrVaF

2.5.1 UrVaF: Abnormal connection between the ureter and the vagina. ***NEW***

2.5.1.1 UrVaF may be congenital (ectopic ureter) ***NEW*** or

2.5.1.2 Acquired (e.g., following surgery or obstructed labor) ***NEW***

2.5.2 Uretero-vesical-vaginal fistula (UrVVaF): Fistula involving the ureter(s), bladder, and vagina. This may be seen with a large obstetric fistula and the ureter is outside the VVaF. ***NEW***

2.5.3 Uretero-uterine (cervical) fistula (UrUtF/UrCxF): Abnormal connection between the ureter and the uterus (cervix). Predominantly post-cesarean or post-supracervical hysterectomy. ***NEW***

2.6 PFF—Anorectal tract to vagina (uterus)

2.6.1 Fourth-degree tears: Obstetric anal sphincter injury with disruption of the perineal body, connecting the vagina to the anorectum. The internal and external anal sphincters are disrupted. ***NEW***

2.6.1.1 Acute fourth degree tear—Occurs at time of childbirth or other trauma. ***NEW***

2.6.1.2 Chronic fourth degree tear—Unrepaired or dehiscence following repair at time of childbirth or other trauma, resulting in an absent perineal body with a total perineal defect[†] (Figure 7A,B). ***NEW***

2.6.2 RVaF: Abnormal connection between the rectum and the vagina. ***NEW***

2.6.2.1 Non-circumferential RVaF: Involves the posterior vaginal wall and anterior rectum. ***NEW***

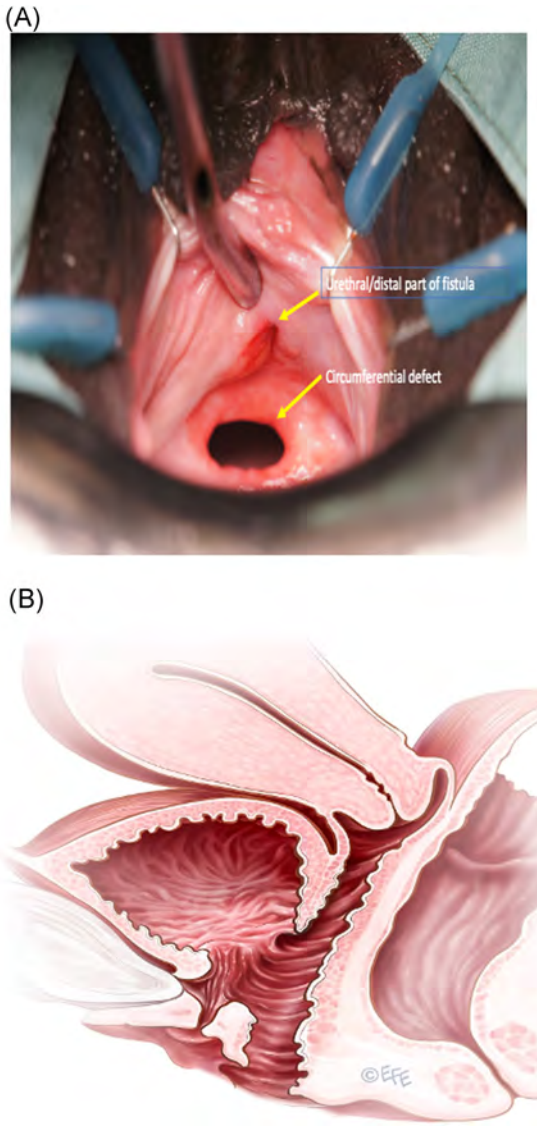

FIGURE 4 (A, left) Circumferential fistula—An entire segment of the urethra (anterior, lateral, posterior) and anterior vaginal wall is absent. Proximal (bladder) part of the fistula is completely disconnected from the distal (urethra) portion. © J Goh. (B, right) © Levent Efe

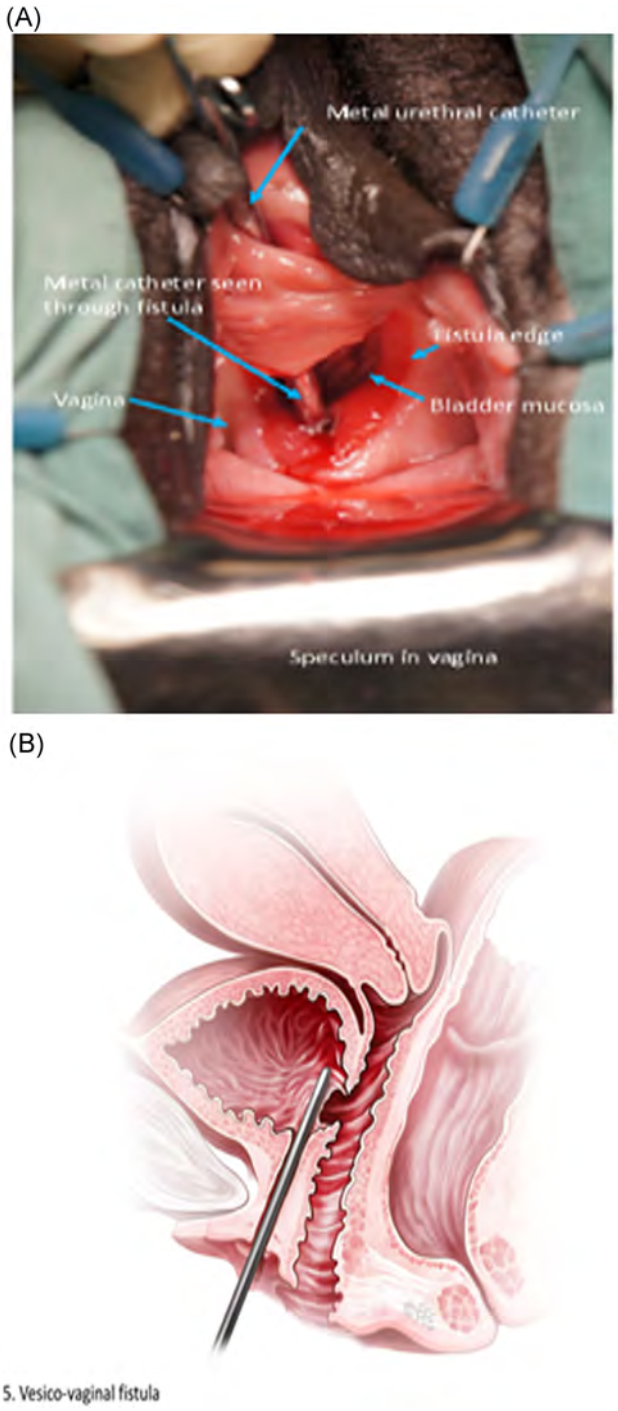

FIGURE 5 (A, left) Vesico-vaginal fistula (VVaF): Metal catheter inserted in urethra visible through VVaF. © J Goh. (B, right) © Levent Efe

2.6.2.2 Circumferential RVaF: Involves an entire segment of the rectum, involving the posterior vaginal wall, anterior and posterior rectum. The proximal rectal part of the fistula is completely separated from the distal portion. ***NEW***

2.6.2.3 Rectal/vaginal/perineal fistula (RVaPeF): An abnormal communication from the anorectum to the vagina or perineal area. ***NEW***

2.6.3 Recto-uterine-cervical fistula (RUtF/RCxF): An abnormal connection from the rectum to the uterus or cervix. ***NEW***

2.6.4 Fistula in ano (FIA)/ano-cutaneous fistula (ACF): An abnormal connection between the anal canal epithelium and the skin epithelium.

2.7 PFF—(colo) rectal to urinary tract

2.7.1 Colo-vesical fistula (CoVF): Abnormal connection between the rectum (colon) and the bladder. ***NEW***

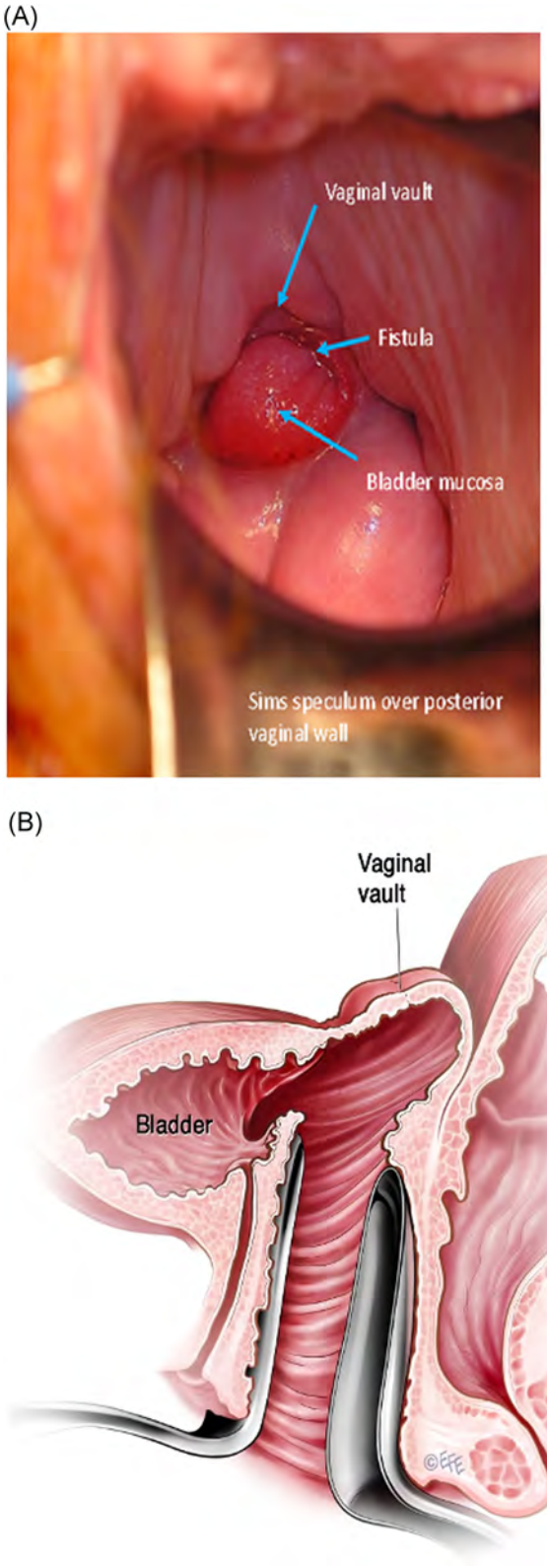

FIGURE 6 (A, left) Vesicovaginal vault fistula (VVtF) after hysterectomy © J Goh. (B, right) © Levent Efe

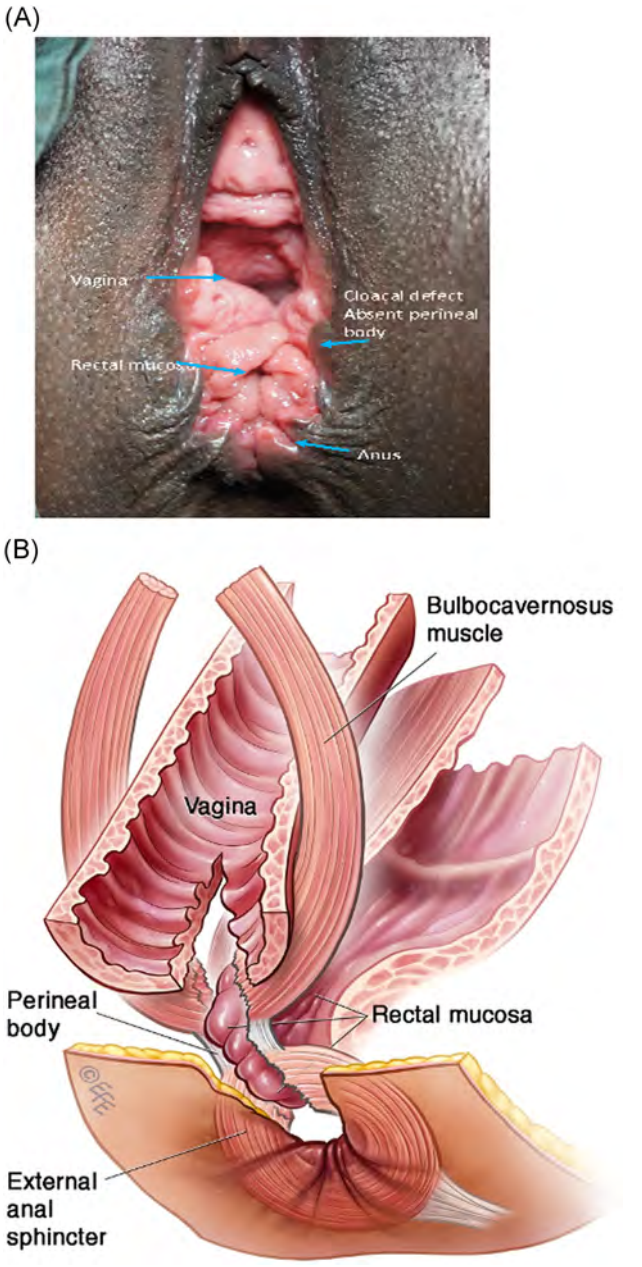

FIGURE 7 (A) Fourth degree rectovaginal tear with perineal body disruption. Congenital defects of a similar configuration may also occur. © J Goh. (B) © Levent Efe

2.7.2 Recto (colo)-ureteric fistula (CoUrF/RUrF): Abnormal connection between the rectum (colon) and the ureter.[‡] ***NEW***

2.8 Published classification systems of PFF

There are published classification systems used for female PFFs predicated on and devised from their ability to predict outcomes of surgery based on these classification systems.[§,**,††,‡‡,§§] These classification systems are: (i) the Francophone System; (ii) the Waaldjik System; (iii) the Goh System; (iv) the Panzi Hospital System.

4 | SECTION 3: SYMPTOMS

Symptom: Any morbid phenomenon or departure from the normal in structure, function, or sensation, experienced by the woman and indicative of disease or a health problem.[1,2] Symptoms are either volunteered by or elicited from the woman or may be described by the woman's caregiver.

Fistula symptoms: A departure from normal sensation, structure, or function, reported by a woman as (i) leakage of urine and/or feces or flatus from the vagina or perineum or; (ii) less commonly as leakage of urine from the anus, or cyclic menouria or hematuria from the urinary tract; or (iii) menstrual flow or other cyclic blood per anum/rectum. Symptoms are often, but not always, continuous, severe and may vary with position including leakage when sleeping (supine). Fistulas with a long tract or flap valve or small defect may make symptoms intermittent ***NEW***.

3.1 PFF symptoms

3.1.1 Discomfort or pain: Complaint of discomfort/pain on the vulva, buttocks, thigh, or legs due to urine or fecal irritation, with or without ulceration or bleeding. ***NEW***

3.1.2 Vaginal urine leakage: Complaint of urine leakage through the vagina. Symptoms are usually continuous but may be intermittent and may be associated with movement or specific changes of position. ***NEW***

3.1.3 Vaginal flatus/feces: Complaint of passage of flatus or feces per vaginam.[12] Symptoms are usually continuous but may be intermittent and may be associated with movement or specific changes of position. ***NEW***

3.1.4 Hematuria: Complaint of the passage of visible blood mixed with urine.[2]

3.2 Urinary tract fistula symptoms[***]

3.2.1 Urinary incontinence: Complaint of involuntary loss of urine.[1–3,6,7]

3.2.2 Continuous (urinary) incontinence: Complaint of continuous involuntary loss of urine.[1–3,6,7]

3.2.3 Postural (urinary) incontinence: Complaint of involuntary loss of urine associated with change of body position, for example, rising from a seated or lying position.[1,3]

3.2.4 Nocturnal enuresis: Complaint of involuntary loss of urine which occurs during the main sleep period.[32]

3.2.5 Insensible (urinary) incontinence: Complaint of urinary incontinence where the woman is aware of urine leakage but unaware of how or when it occurred.[33]

3.2.6 Coital incontinence: Complaint of involuntary loss of urine during or after vaginal intercourse.[14] This symptom might be further divided into that occurring with penetration or intromission and that occurring at orgasm.

3.2.7 Menouria: Complaint of cyclic hematuria that the patient believes to be menstrual. It may represent a VUtF. ***NEW***

3.3 Anorectal tract fistula symptoms

3.3.1 Anal incontinence (symptom): Complaint of involuntary loss of flatus or feces.[1,12]

3.3.2 Fecal incontinence: Complaint of involuntary loss of feces.

3.3.2.1 Solid[1,12]

3.3.2.2 Liquid[1,12]

3.3.3 Flatal incontinence: Complaint of involuntary loss of flatus (gas).[12]

3.3.4 Double incontinence: Complaint of both anal incontinence and urinary incontinence.[12]

3.3.5 Coital fecal (flatal) incontinence: Fecal (flatal) incontinence occurring with vaginal intercourse.[12]

3.3.6 Passive fecal leakage: Involuntary soiling of liquid or solid stool without sensation or warning or difficulty wiping clean.[12]

3.3.7 Overflow fecal incontinence: Seepage of stool due to an overfull rectum or fecal impaction.[12]

3.3.8 Nocturnal defecation: Complaint of interruption of sleep one or more times because of the need to defecate.[12]

3.3.9 Flaturia: Complaint of passage of gas per urethra.[12]

3.3.10 Fecaluria: Complaint of passage of fecal material (per urethra) in the urine.[2]

3.3.11 Rectal leakage of menses: Complaint of blood or bloody discharge passing per anus that the patient believes to be menstrual. ***NEW***

3.3.12 Rectal leakage of urine: Complaint of urine passing per anus. ***NEW***

3.4 Chronic fistula symptoms

3.4.1 Persistent fistula (**symptom**): Continuation of urinary tract and/or anorectal tract incontinence symptoms immediately after fistula treatment caused by incomplete fistula wound healing. This includes inability to close the fistula during surgery. ***NEW***

3.4.2 Recurrent fistula (symptom): Recurrence of fistula defect and incontinence after a period of transient complete fistula wound healing followed by delayed complications of wound healing causing fistula breakdown and fistula re-formation. ***NEW***. It may also be caused by a new index event within the interval from successful repair to recurrence of fistula after which another fistula forms. Examples of subsequent index events include subsequent pregnancy complications causing obstetric PFF, pelvic floor surgery complicated by iatrogenic PFF, malignancy, or pelvic trauma causing traumatic PFF.

3.4.3 Post-repaired fistula residual incontinence symptoms: Urinary or anorectal tract incontinence symptoms after successful fistula closure. ***NEW***[***]

3.5 Persistent fistula-related disorder (PFRD) symptoms

Symptoms from conditions concurrent with the fistula or occurring after *successful* closure of the fistula defect. PFRD may include a complex of disabling symptoms related to comorbidities of general health and well-being, mental, reproductive, and musculoskeletal organs, in addition to symptoms from disorders of the upper and lower urinary, genital and anorectal tracts. ***NEW***

Co-morbidities include but not limited to:

3.5.1 PFRD pain: For example, pain or discomfort in the vagina or vulva with sexual activity. ***NEW***

3.5.2 PFRD mobility dysfunction symptoms: Difficulty walking or changing position or other range of motion symptoms. ***NEW***

3.5.3 PFRD menstrual dysfunction symptoms: Amenorrhea, oligomenorrhea, dysmenorrhea, infertility. ***NEW***

3.5.4 PFRD urinary tract dysfunction symptoms: For example, flank pain, dysuria, hematuria, voiding dysfunction. ***NEW***

3.5.5 PFRD psychological dysfunction symptoms: Anxiety, depression, adjustment disorder with depressed mood, mourning, or grieving may be due to the impact of body image. Effects of loss of income-generating potential or marital, family or social status. ***NEW***

N.B. This terminology document will restrict detailed PFRD terminology definitions to urinary, genital, and anorectal tract for the remainder of the document.

3.5.6 Other common PFRD symptoms

3.5.6.1 General health symptoms[35]: ***NEW***

3.5.6.1.1 Fatigue, malaise, and mental health symptoms which are often multi-factorial in origin

3.5.6.1.2 Emotional, musculoskeletal, gastrointestinal, or urinary tract symptoms related to types of abuse—physical, economic, and/or emotional

3.5.6.2 Mental health symptoms[36–38]: ***NEW***

3.5.6.2.1 Anxiety and/or depression, posttraumatic stress disorder

3.5.6.2.2 Grieving/mourning, stigma, and social isolation, self-esteem, quality of life

3.5.6.2.3 Suicidal ideation, loss of libido, body image disorders, dysphoria, insomnia

3.5.6.3 Musculoskeletal symptoms[35,36,39]: ***NEW***

3.5.6.3.1 Difficulty with ambulation

3.5.6.3.2 Complaint of other quality of life challenges related to activities of daily living caused by diastasis pubis, osteomyelitis, foot-drop, levator ani atrophy, exposed sacral nerve roots, idiopathic chronic pelvic pain, or other musculoskeletal condition incident after index event causing the fistula.

3.5.6.4 Reproductive health symptoms[36]: ***NEW***

3.5.6.4.1 Amenorrhea, oligomenorrhea, dysmenorrhea

3.5.6.4.2 Infertility

3.5.7 Women deemed incurable (WDI): Women with primary, persistent, and recurrent fistula for which anatomic repair is not possible. WDI require either supportive management and/or a diversion procedure, or they have a fistula complexity that exceeds the capacity (s) of the highest available surgical facility:[†††] ***NEW***

3.6 PFRD symptoms of the urinary tract may include:

3.6.1 PFRD sensory urinary tract symptoms: A departure from normal sensation or function, experienced by the woman during bladder filling. Normally, the individual is aware of increasing sensation with bladder filling up to a strong desire to void.[1]

3.6.1.1 Increased urinary frequency: Complaint that voiding occurs more frequently than deemed normal by the individual (or caregivers). Time of day (daytime or nocturnal) or number of voids are not specified.[2]

3.6.1.2 Increased bladder sensation: Complaint that the desire to void during bladder filling occurs earlier or is more persistent to that previously experienced. This differs from urgency by the fact that micturition can be postponed despite the desire to void.[1]

3.6.1.3 Reduced bladder sensation: Complaint that the definite desire to void occurs later to that previously experienced despite an awareness that the bladder is filling.[1]

3.6.1.4 Absent bladder sensation: Complaint of both the absence of the sensation of bladder filling and of a definite desire to void.[1]

3.6.2 PFRD voiding and postmicturition symptoms: A departure from normal sensation or function, experienced by the woman during or following the act of voiding.[2]

3.6.2.1 Hesitancy: Complaint of a delay in initiating voiding (when the individual is ready to pass urine).[2]

3.6.2.2 Slow stream: Complaint of a urinary stream perceived as slower compared to previous performance or in comparison with others.[1]

3.6.2.3 Intermittency: Complaint of urine flow that stops and starts on one or more occasions during voiding.[1]

3.6.2.4 Straining to void: Complaint of the need to make an intensive effort (by abdominal straining, Valsalva or suprapubic pressure) to either initiate, maintain, or improve the urinary stream.[1]

3.6.2.5 Spraying (splitting) of urinary stream: Complaint that the urine passage is a spray or a split stream rather than a single discrete stream.[1] ***CHANGED***

3.6.2.6 Feeling of incomplete (bladder) emptying: Complaint that the bladder does not feel empty after voiding has ceased.[2]

3.6.2.7 Need to immediately re-void: Complaint that further voiding is necessary soon after passing urine (cessation of urine flow).[2]

3.6.2.8 Postmicturition leakage: Complaint of a further involuntary passage or loss of urine following the completion of micturition.[1] ***CHANGED***

3.6.2.9 Position-dependent micturition: Complaint of having to take specific positions to be able to micturate spontaneously or to improve bladder emptying, for example, leaning forwards or backwards on the toilet seat or voiding in the semi-standing position.[1,3]

3.6.2.10 Dysuria: Complaint of burning or other discomfort during voiding. Discomfort may be intrinsic to the lower urinary tract or external (vulvar dysuria).[2]

3.6.2.11 Urinary retention: Complaint of the inability to pass urine despite persistent effort.[1]

3.6.3 PFRD lower urinary tract infection (UTI) symptoms:

3.6.3.1 UTI: Defined as microbiological evidence of significant bacteriuria and pyuria usually accompanied by symptoms such as increased bladder sensation, urgency, frequency, dysuria, urgency urinary incontinence, and/or pain in the lower urinary tract.

3.6.3.2 Recurrent UTIs: At least three symptomatic and medically diagnosed UTI in the previous 12 months. The previous UTI(s) should have resolved before a further UTI being diagnosed.

3.6.3.2.1 Other related history: hematuria, catheterization.

3.6.4 PFRD lower urinary tract pain symptoms:

3.6.4.1 Bladder pain: Complaint of suprapubic or retropubic pain, pressure, or discomfort, related to the bladder, and usually increasing with bladder filling. It may persist or be relieved after voiding.[1,3]

3.6.4.2 Urethral pain: Complaint of pain felt in the urethra and the woman indicates the urethra as the site.[1,3]

3.7 PFRD POP symptoms[3]: A departure from normal sensation, structure, or function, experienced by the woman in reference to the position of her pelvic organs. Symptoms are generally worse at the times when gravity might make the prolapse worse (e.g., after long periods of standing or exercise) and better when gravity is not a factor (e.g. lying supine). Prolapse may be more prominent at times of abdominal straining, for example, defecation. Other associated terms include:

3.7.1 Vaginal bulging: Complaint of a "bulge" or "something coming down" towards or through the vaginal introitus.[3]

3.7.2 Vaginal gaping: Complaint of a "wide open" vaginal introitus. ***NEW***

3.7.3 Pelvic pressure: Complaint of increased heaviness or dragging in the suprapubic area and/or pelvis.[1,3]

3.7.4 Bleeding, discharge, infection: Complaint of vaginal bleeding, discharge, or infection related to prolapse.[3]

3.7.5 Splinting/digitation: Complaint of the need to digitally replace the prolapse[3] or to avoid prolapse descent during periods of increased abdominal pressure. ***CHANGED***

3.7.6 Low backache: Complaint of low, sacral (or "period-like") backache associated with POP.[3]

3.8 PFRD Sexual dysfunction symptoms[1,14]: A departure from normal sensation and/or function experienced by a woman during sexual activity.

3.8.1 Dyspareunia: Complaint of persistent or recurrent pain or discomfort associated with attempted or complete vaginal penetration.[1,14]

3.8.2 Superficial (introital) dyspareunia: Complaint of pain or discomfort on vaginal entry or at the vaginal introitus.[1,14]

3.8.3 Deep dyspareunia: Complaint of pain or discomfort on deeper penetration (mid or upper vagina).[1]

3.8.4 Obstructed intercourse: Complaint that vaginal penetration is not possible due to obstruction.[14]

3.8.5 Vaginal laxity: Complaint of excessive vaginal laxity.[14]

3.9 PFRD genital pain symptoms[1,14]:

3.9.1 Vulval pain: Complaint of pain felt in and around the vulva.[14]

3.9.2 Vaginal pain: Complaint of pain felt internally within the vagina, above the Introitus.[1,14]

3.9.3 Perineal pain: Complaint of pain felt between the posterior fourchette (posterior lip of the introitus) and the anus.[14]

3.9.4 Pelvic pain: The complaint of pain perceived to arise in the pelvis.[14]

3.9.5 Cyclical (menstrual) pelvic pain: Cyclical pelvic pain related to menses that raises the possibility of a gynecological cause.[14]

3.9.6 Pudendal neuralgia: Burning vaginal or vulval (anywhere between anus and clitoris) pain associated with tenderness over the course of the pudendal nerves.[14]

3.9.7 Chronic lower urinary tract and/or other pelvic pain syndromes[1]**:**

3.10 PFRD anorectal tract symptoms[1,12]:

3.10.1 Straining to defecate: Complaint of the need to make an intensive effort (by abdominal straining or Valsalva) to either initiate, maintain, or improve defecation.[1,12]

3.10.2 Feeling of incomplete (bowel) evacuation: Complaint that the rectum does not feel empty after defecation.[12]

3.10.3 Diminished rectal sensation: Complaint of diminished or absent sensation in the rectum.[12]

3.10.4 Constipation: Complaint that bowel movements are infrequent and/or incomplete and/or there is a need for frequent straining or manual assistance to defecate.[12]

3.10.5 Rectal prolapse: Complaint of external protrusion of the rectum.[12]

3.10.6 Rectal bleeding/mucus: Complaint of the loss of blood or mucus per rectum.[12]

3.10.7 Pain during straining/defecation: Complaint of pain during defecation or straining to defecate.[12]

3.10.8. Levator ani syndrome: Episodic rectal pain caused by spasm of the levator ani muscle. Proctalgia fugax (fleeting pain in the rectum) and coccydynia (pain in the coccygeal region) are variants of levator ani syndrome.[12]

3.10.9 Proctalgia fugax is a severe, episodic, generally sacrococcygeal pain.[12]

3.10.10 Fecal incontinence: Involuntary loss of feces or flatus.[1,2]

5 | SECTION 4: PFF SIGNS

4.1 General principles of PFF signs

4.1.1 Sign*:* Any abnormality indicative of disease or a health problem, discoverable on examination of the patient; an objective indication of disease or a health problem.[1]

4.1.2 Correlation of signs and symptoms: Signs should correlate with symptoms e.g. patient report of urinary incontinence is corroborated by visualization of urine leakage into the genital tract through a fistula defect.

4.1.3 Overlap of PFF and non-PFF signs: Because the signs of PFFs overlap with symptoms of urinary and fecal incontinence in patients who have never had a fistula, detailed pelvic exam is essential. Fill tests, with or without dye, may also be used during physical examination to assess the defect(s). The aim is to first diagnose the fistula(s) and to identify the location of the fistula(s) and then to assess the injury by evaluating the amount of tissue defect and scarring/fibrosis.[‡‡‡]

4.1.4 General examination: Is fundamental to the surgical triage process to assure that patients undergoing fistula surgery are suitable for anesthetic and surgical intervention. Surgery scheduling should be delayed until underlying conditions are stabilized with treatment to the best possible state of health. General examination must also rigorously screen for any condition that will impair optimal wound healing, so that the condition may be treated, or cured, before elective reconstructive fistula surgery. Signs of conditions relevant for elective reconstructive surgical triage screening include amongst others: anemia, malnutrition, diabetes, malaria, and other parasites, hepatitis, hypertension, rehydration, renal dysfunction, STI, and HIV.

FIGURE 8 Vulvar dermatitis from exposure to urine © J Goh

4.2 Vaginal fistula signs

4.2.1 Vaginal leakage: Urine, flatus, and/or stool observed leaking into the vagina or from the vagina. ***NEW***

4.2.2 Excoriation: Skin excoriation and/or rash with or without crusting or scabbing on the tops (or soles as urine pools in plastic sandals) of feet, inner thighs, external genitalia (Figure 8), perineum or vagina.[12] ***CHANGED***

4.2.3 Bleeding, discharge: Observed on vaginal examination of the fistula. This includes hematoma. ***NEW***

4.2.4 Scars, sinuses, deformities: Vaginal scarring, vaginal sinus tracts, vaginal stenosis. ***NEW***

4.3 Urinary tract PFF signs

4.3.1 Extra urethral incontinence: Observation of urine leakage through channels other than the urethral meatus, for example, fistula.[12] The fistula may be described anatomically from one structure to another. Below are anatomical descriptions of PFF. The PFF defects may occur between 2 or more structures.

4.3.2 Lower urinary tract PFF[§§§]

4.3.2.1 UVaF—Clinical exam only: Observation of a defect between the urethra and vagina that may occur across a spectrum of tissue loss, from the urethral meatus to the level of the bladder neck, with variable appearance (Figures 2 and 3)[****] ***NEW*** With or without observation of:

4.3.2.1.1 UVaF—Clinical exam and probe: Probe passing through urethra into the vagina through a urethral defect or from the urethral defect back out through the urethral meatus. ***NEW***

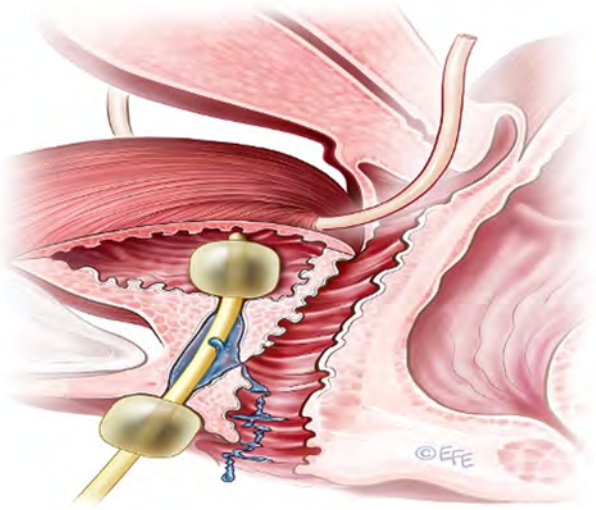

FIGURE 9 Trattner double balloon urethral catheter demonstrating retrograde blue dye for detection of small urethral fistula

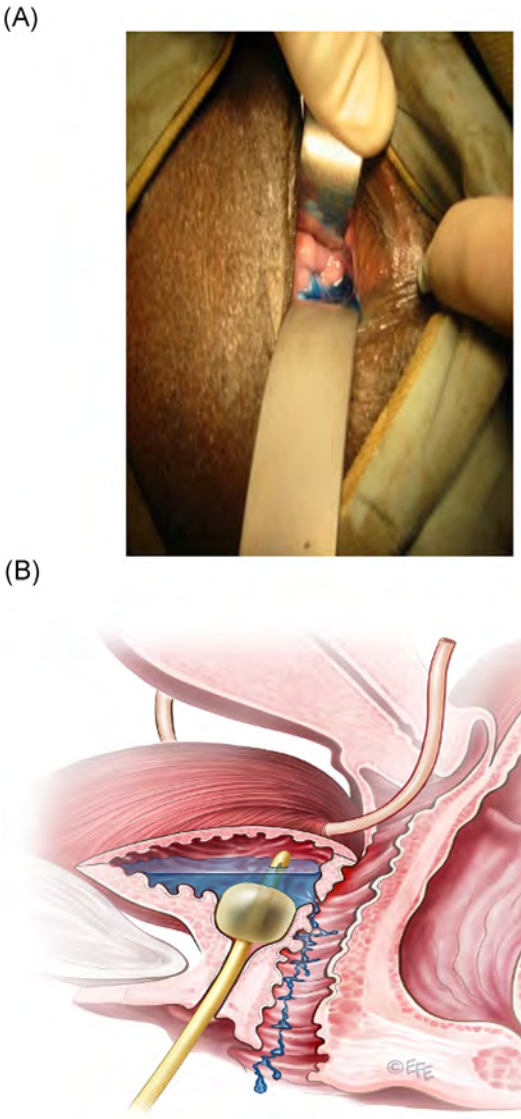

FIGURE 10 (A) Retrograde blue test positive for vesico-vaginal fistula (VVaF) © L J Romanzi. (B) © Levent Efe

4.3.2.1.2 UVaF—Clinical exam and fluid instillation: dyed irrigant fluid passing per defect at the time of retrograde fill test of the bladder through a bladder catheter (positive blue test) (Figure 9). ***NEW***

4.3.2.1.3 UVaF—Clinical exam and Trattner catheter: Trattner catheter (Figure 9) may be used to isolate retrograde blue test filling to the urethral lumen without filling the bladder. ***NEW***

4.3.2.2 VVaF—Clinical exam only: Observation of urine pooling in the vagina and observation of defect between the anterior vaginal wall (including vault) and the bladder (Figure 5). ***NEW*** With or without observation of (Figure 10):

4.3.2.2.1 VVaF—Clinical exam plus probe: Probe passing through urethra into the vagina or from the vagina through the urethral meatus. ***NEW***

4.3.2.2.2 VVaF—Clinical exam plus irrigation: Dyed irrigation fluid passing per defect at the time of retrograde fill test of the bladder through a bladder catheter (positive blue test). ***NEW***

4.3.2.2.3 VVaF—Clinical exam plus bladder mucosa seen: Bladder mucosa visible through the vagina on speculum examination (Figure 6). ***NEW***

4.3.2.3 Vesico-uterine(cervical) fistula (VUtF/VCxF): Defect between the uterus (and/or cervix) and bladder, where the cervix may be intact or deficient. ***NEW*** with or without observation of:

4.3.2.3.1 VUtF—Clinical Exam only: Menouria: (cyclical) hematuria coinciding with menstruation. ***NEW***

4.3.2.3.2 VUtF—Clinical exam plus probe: Probe passing though urethra into the cervical os or from the cervix through the urethral meatus (Figure 11). ***NEW***

4.3.2.3.3 VUtF—Clinical exam plus irrigation: Dyed irrigation fluid passing per cervical os at the time of retrograde dyed irrigant fill test of the bladder through a bladder catheter. ***NEW***

4.3.2.4 Colo-vesical) fistula (CoVF): Defect between the anorectum (or colon) and bladder. ***NEW*** with or without observation of:

4.3.2.4.1 CoVF—Clinical exam only: observation of flaturia, fecaluria. ***NEW***

4.3.2.4.2 CoVF—Clinical exam plus PR air injection: observation of flaturia, fecaluria bubbles passing through the urethra after retrograde injection of air per rectum. ***NEW***

4.3.2.4.3 CoVF—Clinical exam plus irrigation: observation of dyed irrigation fluid passing per anorectum after retrograde bladder fill per urethra. ***NEW***

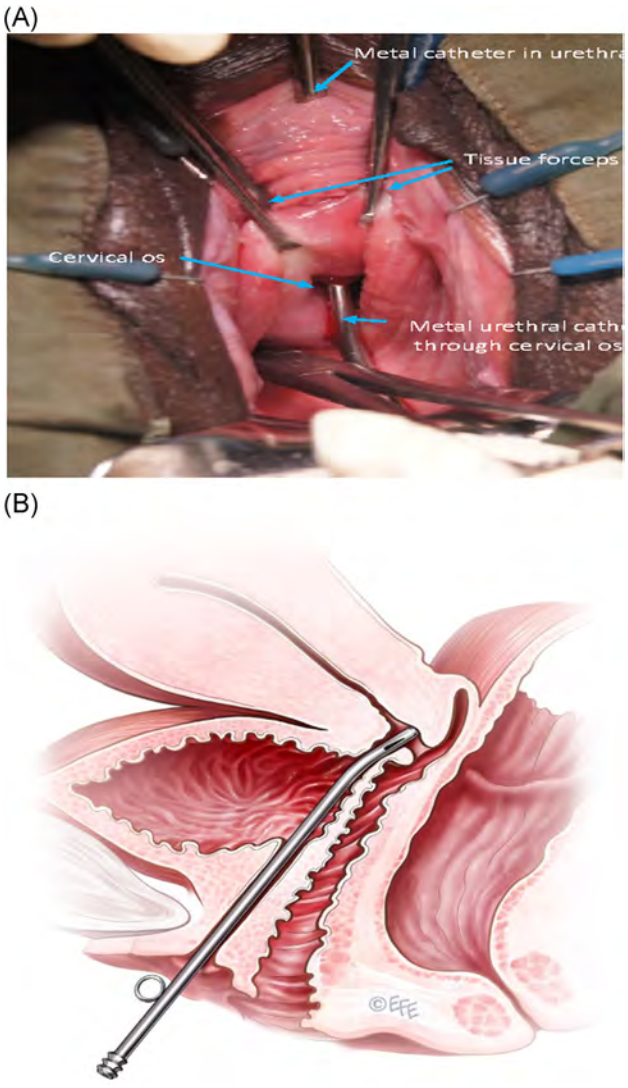

FIGURE 11 (A, above) Vesico-cervical fistula (: Metal catheter inserted per urethra is visible within the cervical os. © J Goh; (B, below) © Levent Efe

4.3.3 Upper urinary tract PFF

4.3.3.1 UrVaF: Abnormal connection between the ureter(s) and vagina.

NEW With or without observation of:

4.3.3.1.1 UrVaF—Clinical exam only: Observation of urine pooling in the posterior vaginal fornix. ***NEW***

4.3.3.1.2 UrVaF—Clinical exam plus irrigation: Observation of urine pooling in the posterior vaginal fornix at the time of retrograde dyed irrigation fill test of the bladder through a bladder catheter (negative dye test, positive urine). ***NEW***

4.3.3.1.3 UrVaF—Occurrence in isolation: For example, at the vaginal vault following a hysterectomy including Cesarean hysterectomy. ***NEW***

4.3.3.1.4 UrVaF—Occurrence in combination: For example, in combination of a VVaF. ***NEW***

4.3.3.2 UrUtF/UrCxF: abnormal connection between the ureter(s) and the uterus/cervix. ***NEW*** With or without observation of:

4.3.3.2.1 UrUtF—Clinical exam only: Observation of urine passing through the cervix or pooling in the posterior vaginal fornix. ***NEW***

4.3.3.2.2 UrUtF—Clinical exam plus irrigation: Observation of urine passing per cervical os; with or without pooling in the posterior vaginal fornix at the time of retrograde dyed irrigant fill test of the bladder through a bladder catheter (negative blue test, positive clear urine). ***NEW***

4.3.3.3 UrUtF/UrCxF: Complex of multiple urinary tract fistulas concurrent between the ureter and uterus/cervix and between the bladder and uterus/cervix. ***NEW*** Difficult to diagnose clinically. It is often diagnosed by hysterosalpingogram (HSG).[††††,‡‡‡‡,§§§§]

4.4 Anorecto-vaginal fistula signs[1,2]

4.4.1 General signs

4.4.1.1 Excoriation dermatitis: Inner thighs, external genitalia, generally

4.4.1.1.1 Perineum or vagina with or without skin rashes, crusting or scabbing. ***CHANGED***

4.4.1.2 Soiling: Perianal, vaginal, or perineal fecal soiling[1,12]

4.4.1.3 Discharge: Perianal or vaginal bloody or mucus discharge[1,12]

4.4.1.4 Scars, sinuses, deformities, hematoma[1,12]

4.4.2 Deficient perineum/total perineal defect: A spectrum of tissue loss from the perineal body and rectovaginal septum with variable appearance. There can be a common cavity made up of the anterior vagina and posterior rectal walls or just an extremely thin septum between the anorectum and vagina.[12]

4.4.3 Fourth degree perineal tear (4^0PT): Defined as an acquired childbirth injury and a subset of deficient perineum, involving both loss of the rectovaginal septum, full thickness anterior defect of the anal sphincter, and variable loss with lateral displacement of the fibromuscular architecture of the perineal body (total perineal defect) (Figure 7).

4.4.4 Rectovaginal fistula (RVaF): Abnormal connection between the rectum to the vagina with or without observation of vaginal flatus/feces.[12] With or without the observation of:

4.4.4.1 RVaF—Clinical exam only: Anorectal fluid per vagina. ***NEW***

4.4.4.2 RVaF = Clinical exam plus probe: Probe or examination finger passing per vagina through anus or per anus through vagina (Figure 12). ***NEW***

4.4.4.3 RVF—Clinical exam plus irrigation or air injection: Anorectal tract fluid per vagina, or with bubbles passing through the abnormal connection

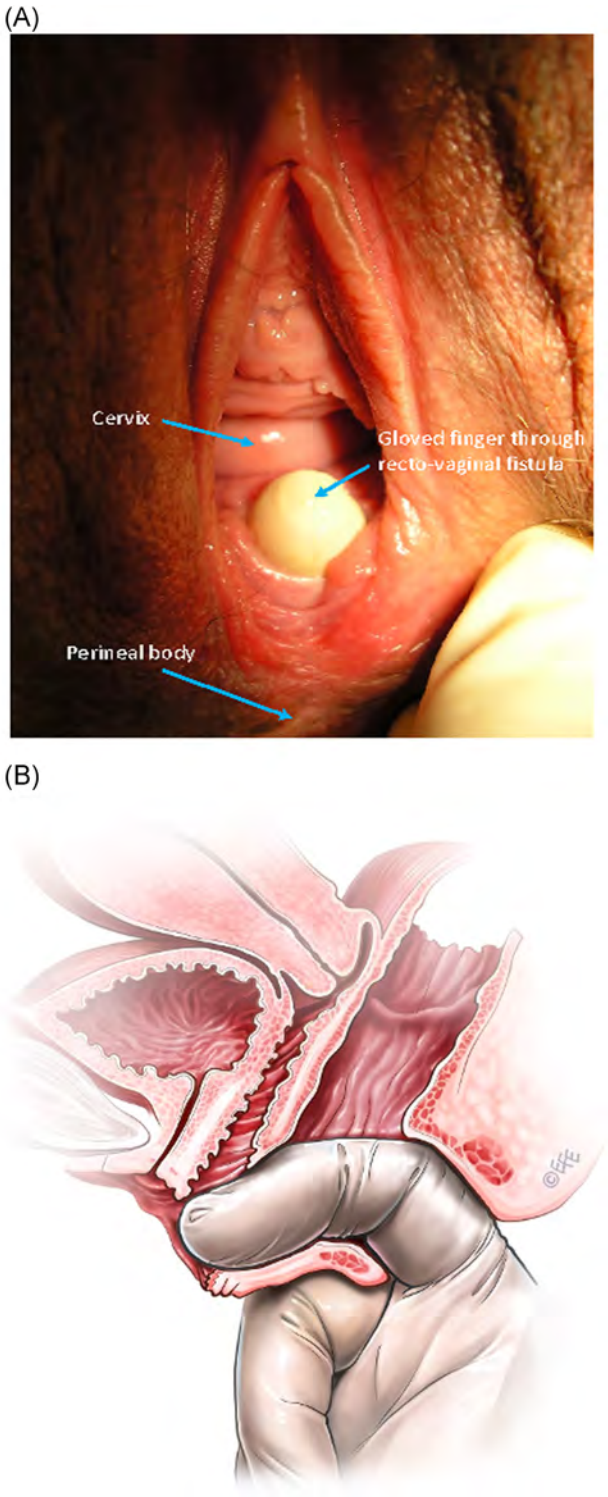

FIGURE 12 (A) Recto-vaginal fistula (RVaF), low in the vagina, just proximal to the anus ©J Goh. (B) © Levent Efe

through vaginal irrigant fluid after retrograde injection of air per rectum. ***NEW***

4.4.5 Colo-uterine/cervical fistula (CoUtF/CoCxF): Abnormal connection between the colo/rectum and uterus (body and/or cervix). ***NEW*** With or without the observation of:

4.4.5.1 R(C)UtF—Clinical exam only: Passing flatus/feces per cervix, menses per rectum, anorectal tract fluid per vagina. ***NEW***

4.4.5.2 R(C)UF—Clinical exam plus irrigation or air injection: With bubbles passing through the abnormal connection through vaginal irrigant fluid after retrograde injection of air per rectum. ***NEW***

4.4.6 RVaPeF: Is an abnormal communication from the anorectum to the vagina or perineal area. ***NEW***

4.4.6.1 RVaPeF—Clinical Exam only: Passing of flatus/feces per vagina or perineum through anus.

4.4.6.2 RVaPeF—Clinical exam plus probe: Probe passing per vagina or perineum through anus.

4.4.7. Vesico-rectal fistula (VRF): Abnormal connection between the bladder and rectum. ***NEW*** With or without observation of:

4.4.7.1 VRF—Clinical exam plus probe: probe passing per urethra through anus or per anus through urethra. ***NEW***

4.4.7.2 VRF—Clinical exam plus irrigation: Flaturia, fecaluria, bubbles passing through the urethra after retrograde injection of air per rectum, blue irrigant fluid passing per anorectum after retrograde bladder fill per urethra. ***NEW***

4.4.8 FIA/ACF: an abnormal connection between the anal canal epithelium and the skin epithelium.

4.4.8.1 Patients may complain of pain, swelling, intermittent discharge of blood or pus from the fistula, and recurrent abscesses formation.[12]

4.5 Chronic fistula signs

4.5.1 Persistent fistula: The persistent fistula is not de novo to the patient.

4.5.1.1: Persistent urine or fecal (flatal) incontinence: Observation of involuntary, extra-urethral loss of urine and/or extra-anal loss of flatus/feces on examination. ***NEW***

4.5.1.2 Incomplete fistula wound healing: after treatment which includes inability to close the fistula during surgery. ***NEW***

4.5.2 Recurrent fistula (signs): The recurrent fistula is de novo to the patient.

4.5.2.1 Recurrent urine or fecal (flatal) incontinence: Observation of recurrent involuntary, extra-urethral loss of urine and/or extra-anal loss of flatus/feces on examination. ***NEW***

4.5.2.2 Recurrent fistula defect: Observation of, within a clinical history context of previous fistula repair (i) a period of transient complete fistula wound healing followed by delayed complications of wound healing causing fistula breakdown and fistula re-formation, or (ii) fistula recurring within the interval from successful treatment to recurrence of fistula after which another fistula forms. ***NEW***

4.6 WDI signs

4.6.1. Definition: The fistula, in this case, is "beyond repair" and may have never undergone treatment, but usually the symptom history is consistent with Chronic Fistula. Symptoms may be consistent with *persistent fistula* but there may also be symptoms consistent with *recurrent fistula*. There may be multiple attempts at repair and operations for persistent incontinence. WDI signs are often the most severe forms of fistula signs, be it treated or untreated. ***NEW***

4.6.2 Extra-urethral incontinence: Observation of urine leakage through channels other than the urethral meatus, combined with (i) observation of severe or total loss of the bladder, and/or (ii) observation of a urinary tract fistula that exceeds local capacity for successful anatomic treatment. ***CHANGED***

4.6.3 Extra-anal incontinence: Observation of fecal or flatal leakage through channels other than the anal verge, combined with (i) observation of severe or total loss of the anorectum, and/or (ii) observation of an anorectal fistula that exceeds local capacity for successful anatomic treatment. ***NEW***

6 | SECTION 5: INVESTIGATIONS

5.1 Dye and bubble tests for PFF

Dye tests may be used to detect small or unusual fistulas (less useful for large or multiple fistulas), such as utero-vaginal or cervico-vaginal fistulas and to differentiate ureteric fistula (clear or yellow urine in vault, "negative dye test with urine in vault") from bladder fistula ("positive dye test") or to detect small or distorted anorectal fistula (positive vaginal bubble or rectal dye test). Dye and bubble tests are typically done at time of clinical examination for PFF, thus their inclusion in the "Signs" section. ***NEW***

5.1.1 Simple dye test for urinary tract fistulas

The bladder is filled retrograde through a urethral catheter using a dye to change the color of the irrigation fluid, for example, methylene blue or indigo carmine to turn the irrigation fluid blue (Figure 10). Observation may begin with or without retractor(s) in the vagina, depending on digital and visual exam signs and patient symptoms, or following careful dissection. Blue fluid leakage per genital tract or per anus indicates a bladder or urethral fistula. Lack of blue fluid leakage combined with visualization of extra-meatal clear urine leakage increases suspicion of an upper urinary tract ureteric fistula. ***NEW***

5.1.2 Triple swab test for urinary tract fistula

Three separate sponge swabs, one above the other, are placed in the upper, middle, and lower vagina. The bladder is then filled with a colored irrigant such as diluted methylene blue, and the swabs are removed after 10 min (it can take up to 30 min for urine to come through a tiny tortuous fistula especially if it is in the cervix or uterus). Discoloration of only the lowest swab supports diagnosis of a low urethral fistula or urethral leakage. Diagnosis of a uretero-genital fistula is supported when the uppermost swab is wet but not discolored. A VVaF fistula diagnosis is supported when the upper swabs are wet with blue irrigant. Careful observation for backflow of blue irrigant per meatus must be ongoing to avoid false-positive test reporting. ***NEW***

5.1.3 Double dye test for urinary tract fistula:

This includes oral intake of phenazopyridine (pyridium) 200 mg three times a day for one to two days until urine is bright orange, followed by retrograde bladder filling with blue irrigant through a bladder catheter. Diagnosis of a bladder or urethral fistula to the vagina (VVaF, UVaF) is supported if the vaginal swab turns blue. Diagnosis of a ureteric fistula to the vagina is supported if the swab turns orange, combination upper and lower urinary tract fistula to the vagina is supported if the swab turns both blue and orange. Careful observation for backflow of blue irrigant per meatus must be ongoing to avoid false-positive test reporting. ***NEW***

5.1.4 Trattner double balloon catheter test for urethral fistula:

The Trattner catheter has two balloons, one sits intravesically and the other inflates outside of the meatus to block efflux from the urethra. The irrigant flows out through a lumen that sits between the balloons, isolating fill to the urethra (Figure 9). ***NEW***

5.1.5 Posterior wall irrigant/fluid per rectum for anorectal tract fistula:

As with bladder dye testing, dye irrigation fluid may be instilled per rectal catheter. If colored irrigant passes per vagina, an anorectal fistula to the genital tract is confirmed. ***NEW***

5.1.6 Posterior wall "bubble test" for anorectal tract fistula:

With anterior vaginal wall retraction permitting visualization of the posterior vaginal wall, a Foley catheter is inserted into the rectum, the balloon inflated, and held under gentle traction against the anus. Irrigant fluid is placed per vagina. A catheter-tipped, air-filled syringe is inserted into the catheter and slowly decompressed to insert air into the rectum. Vaginal inspection allows visualization of bubbles emanating per vagina through a fistula defect. ***NEW***

5.2. Endoscopy evaluations for PFF and PFRD:

These are normally not included in investigations in ICS documents, nor in the ICS Glossary. However, they may have a role in assessing (i) a small PFF; (ii) different PFRD issues.

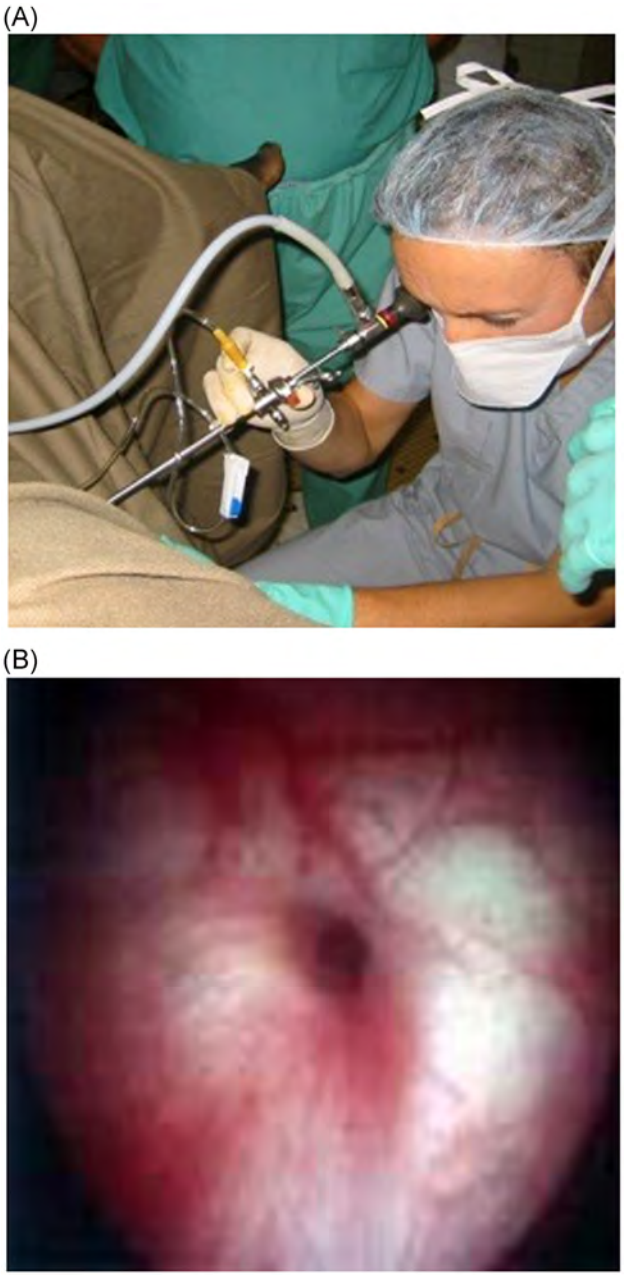

FIGURE 13 (A) Cystoscopy in a fistula patient in Niamey, Niger. (B) Cystoscopic image of fistula defect. ©L J Romanzi and Badlani

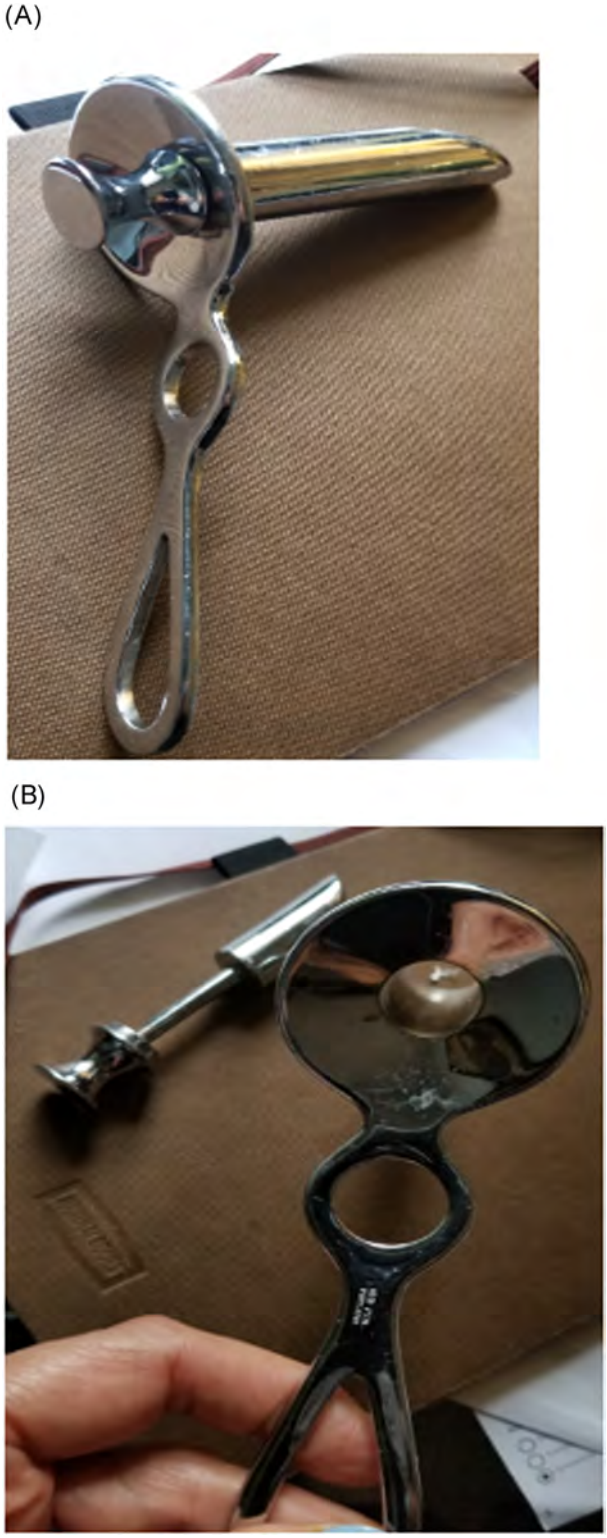

FIGURE 14 (A) Anoscope and (B) anoscope demonstration. ©L J Romanzi

5.2.1 Cystoscopy and urethroscopy

Cystoscopy and urethroscopy may be used to better understand the configuration of upper and lower urinary tract fistulas (Figure 13A,B) and the proximity of the lower urinary tract to the ureteric orifice.***** ***NEW*** It will clearly identify other pathology, for example, stone, tumor. Cystoscopy may, however, only be possible in the smallest of fistulas where the bladder can still contain fluid (see Figure 13A,B).*****

5.2.2 Anoscopy and sigmoidoscopy

Lower gastrointestinal endoscopy may be used to better understand the configuration of upper and lower anorectal tract fistula. Anorectal endoscopy is also helpful when evaluating PFRD of the anorectal tract

(Figure 14A,B), such as stricture, residual anorectal incontinence, rectal pain syndromes, and compromised rectovaginal fistula wound healing. ***NEW***

5.2.3 Genital tract examination

Vaginoscopy may be undertaken with any endoscopic equipment or nasal speculum. It is particularly helpful in the evaluation of pediatric patients and women with severe vaginal stenosis. Hysteroscopy make be undertaken to evaluate cervical patency and endometrial integrity for women reporting PFRD amenorrhea and/or infertility. ***NEW***

5.3 Bladder function studies for PFRD

There is no defined role for urodynamic investigations before the closure of urethral or bladder fistulas—for example, pressure readings would be unreliable if an organ is leaking.

5.3.1 Functional evaluation (UDS) for lower urinary tract PFRD[1]

5.3.1.1 UDS: Measurement of all the physiological parameters relevant to the function and any dysfunction of the lower urinary tract[40,41]

5.3.1.2 Urodynamic usage in low resource regions: MUDS is becoming increasingly available in low resource regions. A brief overview of UDS evaluation for common bladder pathologies occurring after fistula repair surgery will be reviewed in this document. Simple, single-channel urodynamics ("Simple Cystometrics"), a technique more commonly available in resource-constrained facilities, is also reviewed in this section.[†††††]

5.3.2 Single channel UDS ("Simple Cystometrics")[42]: Use of a catheter, catheter-tipped syringe, and sterile irrigant solution, may provide rudimentary yet valuable information to guide treatment algorithms. Any residual fistula needs to be excluded. Simple "cystometrics" requires the insertion of an indwelling catheter which is secured with inflation of the balloon (not present in Figure 15). The bladder is filled with a catheter tipped syringe to approximately 300 ml of saline. The end of the catheter (after removing the syringe) is held vertically about 15 cm above the pubic symphysis and the level of the fluid in the catheter is noted. The volume for each filling sensation is noted. When there are no urge symptoms and no elevation of the meniscus, then the vesical pressure is considered "stable." When the catheter is removed a cough test is performed to assess for stress urinary incontinence. ***NEW***

5.3.3 MUDS[40,41] Combines measurement of bladder and rectal pressures, filling volume and voided volume (VV), and urine flow rate (UFR) (with or without video cystography). In centers where MUDS capacity exists, it is the preferred method for evaluating the complex aetiologies that often contribute to residual lower urinary tract dysfunction after fistula repair.

5.3.3.1 Clinical sequence of UDS testing[1,2] Urodynamic investigations generally involve an individual attending with a comfortably full bladder for free (no catheter) uroflowmetry and post-void residual (PVR) measurement before filling cystometry and pressure-flow study.

5.3.4 Uroflowmetry:

5.3.4.1 Ideal conditions for free (no catheter) uroflowmetry: Ideally, all free uroflowmetry studies

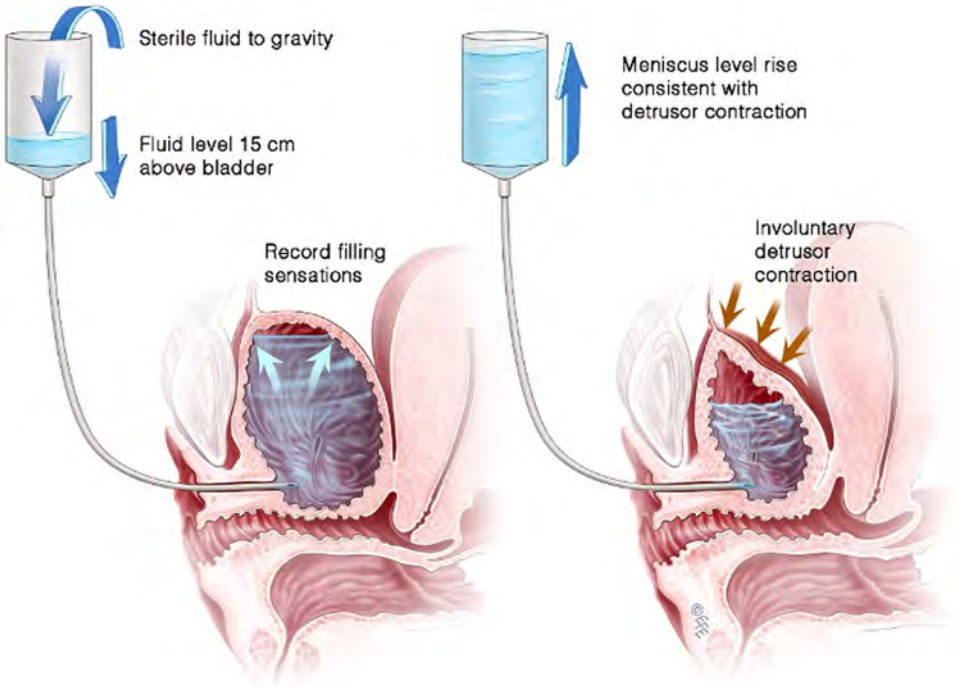

FIGURE 15 Simple urodynamics catheter placement and process overview

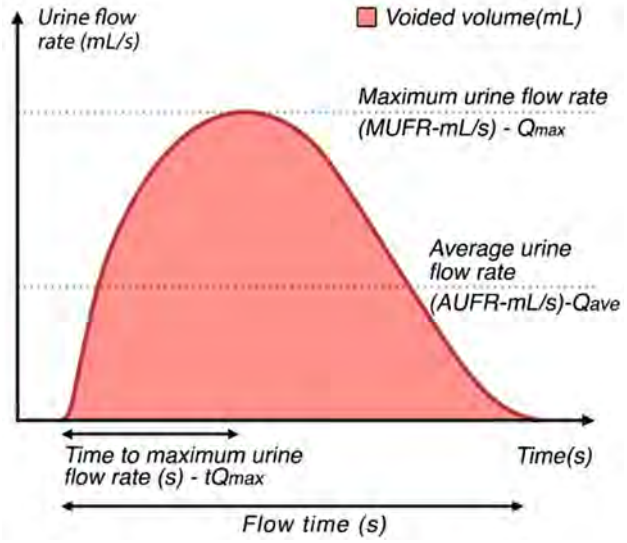

FIGURE 16 A schematic representation of urine flow over time and parameters of uroflowmetry

should be performed in a completely private uroflowmetry room.

Most modern uroflowmeters have a high degree of accuracy (±5%) though regular calibration is important.

5.3.4.2 Urine flow: Urethral passage of urine where the pattern of urine flow may be.[1,2,43,44]

5.3.4.2.1 Continuous urine flow: No interruption to urine flow.

5.3.4.2.2 Intermittent urine flow: Urine flow is interrupted.

5.3.4.3 UFR (ml/s): Volume of urine expelled via the urethra per unit time.[1,2,43,44]

5.3.4.4 VV (ml): Total volume of urine expelled via the urethra during a single void.[1,2,43,44]

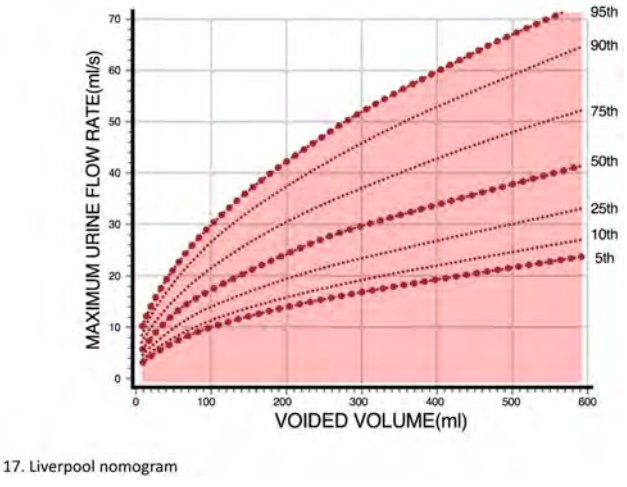

FIGURE 17 Liverpool Nomogram for maximum urine flow rate in women.[43] Ln (Maximum urine flow rate) = 0.511 + 0.505 x Ln (voided volume). Root mean square error = 0.340. Reference: [43] (Reproduced with permission)

5.3.4.5 Maximum (urine) flow rate (MUFR, ml/s)—Q_{max}: Maximum measured value of the UFR corrected for artefacts.[1,2,43,44]

5.3.4.6 Flow time (FT, s): Time over which measurable flow actually occurs. [1,2,43,44]

5.3.4.7 Average (urine) flow rate (AUFR, ml/s)—Q_{ave}: VV divided by the FT (Figure 16).[1,2,43,44]

5.3.4.8 Voiding time (VT, s): Total duration of micturition, that is, includes interruptions.

When voiding is completed without interruption, VT is equal to FT.[1,2,43,44]

5.3.4.9 Time to maximum UFR (tQ_{max}, s): Elapsed time from the onset of urine flow to maximum urine flow.[1,2,6,7]

5.3.4.10 Interpretation of the normality of free uroflowmetry: Because of the strong dependency of UFRs in women on VV,[43] they are best referenced to nomograms[43] where the cutoff for normality has been determined and validated and where the cut-off for abnormally slow (MUFR, AUFR) urine flow has been determined and validated as under the 10th centile of the respective Liverpool nomogram (Figure 17).[44]

5.3.5 Postvoid residual (PVR): Volume of urine left in the bladder at the completion of micturition.[1,2]

5.3.5.1 Conditions for PVR measurement[1,2]: PVR reading is erroneously elevated by delayed measurement due to additional renal input (1- 14mls/min) into bladder volume. Ultrasonic techniques allow immediate (within 60 seconds of micturition) measurement.[45,46] A short plastic female catheter provides the most effective bladder drainage for PVR measurement.[45]

5.3.5.2 Assessment of normality of PVR: Quoted upper limits of normal may reflect the accuracy of measurement. Studies using "immediate" PVR measurement (e.g. ultrasound) suggest an upper limit of normal of 30mls. Studies using urethral catheterization (up to 10-min delay) quote higher upper limits of normal of 50 ml or more.[45] An isolated finding of a raised PVR requires confirmation before being considered significant.

5.3.6 Filling cystometry: is the pressure/volume relationship of the bladder during bladder filling.[1,2,6,7,40,41] It begins with the commencement of filling and ends when a "permission to void" is given. When multi-channel cystometry is done with fluoroscopy it is known as video cystometrogram (CMG) or VCMG.

5.3.6.1: CMG: Graphical recording of the bladder pressure(s) and volume(s) over time.[1,2,6,7,40,41]

5.3.6.2 Conditions for cystometry including:

5.3.6.2.1: Fluid: Water or saline unless radiological imaging.[1,2]

5.3.6.2.2 Temperature of fluid: Fluid at room temperature is mostly used.[1,2]

5.3.6.2.3 Position of patient: Sitting position is more provocative for abnormal detrusor activity (i.e., overactivity) than the supine position.[1,2]

5.3.6.2.4 Filling rate: A medium fill rate (50 ml/min) should be applicable in most routine studies. Much slower filling rates (under 25 ml/min) are appropriate in women in whom there are concerns about poor compliance (or with a bladder diary showing low bladder capacity or those with neuropathic bladder.[1,2]

5.3.6.3 Intravesical pressure (P_{ves}, cm H_2O): The pressure within the bladder (as directly measured by the intravesical catheter)[1,2,40,41]

5.3.6.4 Abdominal pressure (P_{abd}, cm H_2O): The pressure in the abdominal cavity surrounding the bladder. It is usually estimated by measuring the rectal pressure or vaginal pressure, though the pressure through a bowel stoma can be measured as an alternative. The simultaneous measurement of abdominal pressure is essential for interpretation of the intravesical pressure trace.[1,40,41] Artifacts on the detrusor pressure trace may be produced by a rectal contraction.[1,40,41]

5.3.6.5. Detrusor pressure (P_{det}, cm H_2O): The component of intravesical pressure that is created by forces in the bladder wall (passive and active). It is calculated by subtracting abdominal pressure from intravesical pressure ($P_{det} = P_{ves} - P_{abd}$).[1,40,41]

5.3.6.6 Aims of filling cystometry: To assess bladder sensation, bladder capacity, detrusor activity, and compliance as well as to document (the situation of and detrusor pressures during) urine leakage.[1]

5.3.6.7 Bladder sensation during filling cystometry: Usually assessed by questioning the individual in relation to the fullness of the bladder during cystometry.

5.3.6.7.1 First sensation of bladder filling: The feeling when the woman first becomes aware of bladder filling.[1]

5.3.6.7.2 First desire to void: The first feeling that the woman may wish to pass urine.[1]

5.3.6.7.3 Normal desire to void: The feeling that leads the woman to want to pass urine at the next convenient moment, but voiding can be delayed if necessary.[1]

5.3.6.7.4 Strong desire to void: The persistent desire to pass urine without the fear of leakage.[1]

5.3.6.7.5 Urgency: Sudden, compelling desire to void which is difficult to defer.[1]

5.3.6.7.6 Cystometric capacity: Bladder volume at the end of filling cystometry (Figure 18).[1]

5.3.6.8 Abnormal bladder sensation during filling cystometry

5.3.6.8.1 Bladder oversensitivity[1]—Increased bladder sensation during bladder filling with (i) earlier first desire to void; (ii) earlier strong desire to void, which occurs at low bladder volume; (iii) lower maximum cystometric bladder capacity; (iv) no abnormal increases in detrusor pressure.

5.3.6.8.2 Reduced bladder sensation: Bladder sensation perceived to be diminished during filling cystometry.

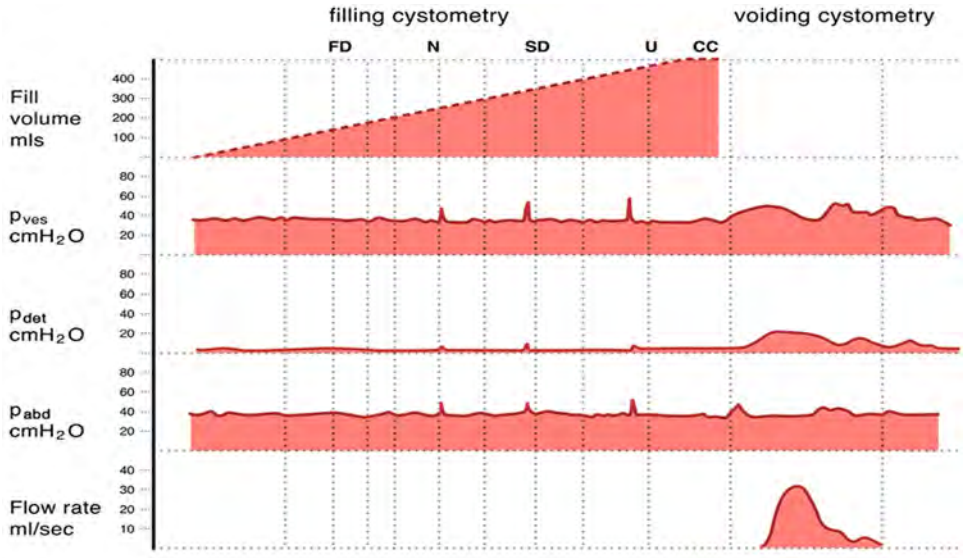

FIGURE 18 48-year-old female with urinary frequency. No phasic activity during filling. Voided with normal urine flow rate at normal detrusor voiding pressure. Normal study. CC, cystometric capacity (permission to void given); FD, first desire to void; ND, normal desire to void; SD, strong desire to void; U, urgency

5.3.6.8.3 Absent bladder sensation: No bladder sensation during filling cystometry, at least to expected capacity of 500 ml.

5.3.6.9 Detrusor function during filling cystometry

5.3.6.9.1 Normal detrusor activity/function[2]: There is little or no change in detrusor pressure with filling. There are no detrusor contractions, spontaneous or provoked with activities such as postural changes, coughing or hearing the sound of running water (Figure 19).

5.3.6.9.2 Detrusor overactivity (DO)[2]: The occurrence of detrusor contraction(s) during filling cystometry. These contractions, which may be spontaneous or provoked, produce a wave form on the CMG, of variable duration and amplitude. The contractions may be phasic or terminal. They may be suppressed by the patient, or uncontrollable. Symptoms, for example, urgency and/or urgency incontinence or perception of the contraction may (note if present) or may not occur.

5.3.6.9.2.1 Idiopathic (primary) DO[2]: No identifiable cause for involuntary detrusor contraction(s).

5.3.6.9.2.2 Neurogenic (secondary) DO[2]: DO and evidence (history; visible or measurable deficit) of a relevant neurological disorder.

5.3.6.9.2.3 Non-neurogenic (secondary) DO[2]: An identifiable possible non-neurological cause exists for involuntary detrusor contraction(s) during bladder filling. e.g. functional (obstruction); stone, tumor, UTI

5.3.6.9.3 Bladder (detrusor) compliance (ml/cm H_2 O)[2]

5.3.6.9.3.1 Description: Relationship between the change in bladder volume and change in detrusor pressure as a measure for the distensibility of the bladder.[2]

5.3.6.9.3.2 Calculation[2]: Divide the change of volume (ΔV) by the simultaneous change in detrusor pressure (ΔP_{det}) during filling cystometry—($C = \Delta V / \Delta P_{det}$). The compliance reflects the amount of fluid in the bladder to increase bladder pressure by 1 cm H_20 and is expressed as ml/cm H_2O.

5.3.6.9.3.3 Normal values[2]: Low compliance has been defined (in women) as bladder compliance < 10 ml/cm H_2O (neurogenic) or <30 ml/cm H_20 (non-neurogenic). Normal compliance is >30 ml/cm H_2O (neurogenic) and 40 ml/cm H_20 (non-neurogenic).

5.3.6.10 Urethral function during filling cystometry (filling urethro-cystometry): Urethral closure mechanism.

5.3.6.10.1 Normal urethral closure mechanism[2]: A positive urethral closure pressure is maintained during bladder filling, even in the presence of increased abdominal pressure, although it may be overcome by DO.

5.3.6.10.2 Incompetent urethral closure mechanism[2]: Leakage of urine occurs during activities which might raise intra-abdominal pressure in the absence of a detrusor contraction.

5.3.6.10.3 Urodynamic stress incontinence (USI)[2]: Involuntary leakage of urine during filling

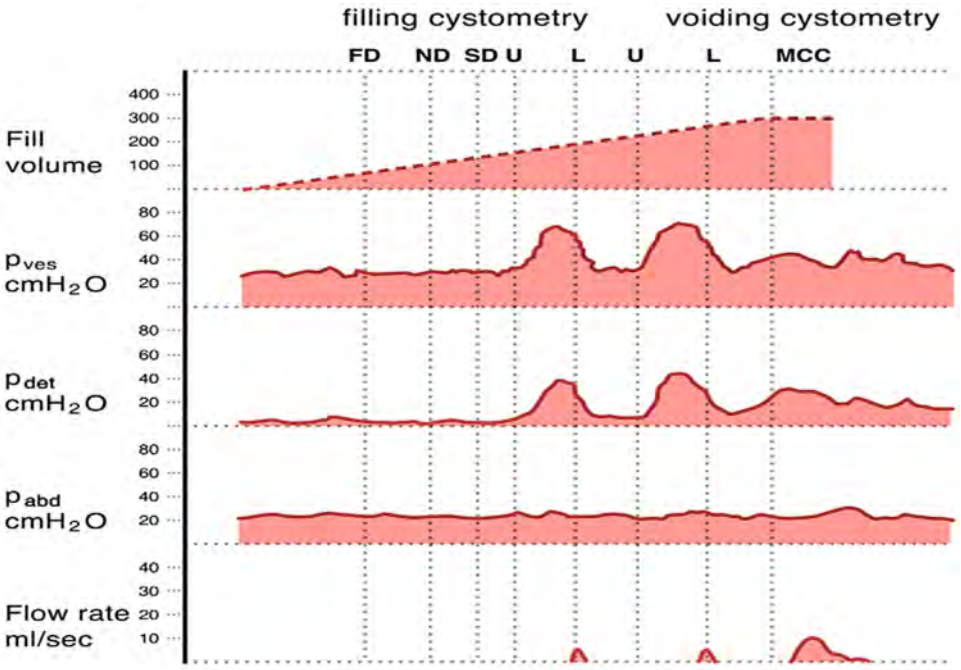

FIGURE 19 52-year-old female with urgency and frequency. Phasic detrusor activity during filling. Leakage is associated with urgency and detrusor contractions. FD, first desire to void; L, leakage; MCC, maximum cystometric capacity; ND, normal desire to void; SD, strong desire to void; U, urgency

cystometry, associated with increased intra-abdominal pressure, in the absence of a detrusor contraction.

5.3.6.10.4 Subtype: Intrinsic sphincter deficiency (ISD)[2]: Very weakened urethral closure mechanism.

5.3.7 Voiding cystometry[1,2](pressure-flow studies): This is the pressure–volume relationship of the bladder during micturition. It begins when the "permission to void" is given by the urodynamicist and ends when the woman considers her voiding has finished. Measurements to be recorded should be the intravesical, intra-abdominal, and detrusor pressures during the voiding urinary flow, including the UFR. A partial synopsis of some voiding cystometry measures is included here.

5.3.7.1 Pressure and other measurements during voiding cystometry:

5.3.7.1.1 Detrusor opening pressure (cm H_2O)[1,2]: Detrusor pressure recorded immediately before the commencement of urine flow.

5.3.7.1.2 Flow delay (s)[2]: The time elapsed from initial rise in pressure to the onset of flow. This is the initial isovolumetric contraction period of micturition. It reflects the time necessary for the fluid to pass from the point of pressure measurement to the uroflow transducer.

5.3.7.1.3 Urethral opening pressure ($P_{det\text{-}uo}$, cm H_2O)[2]: Detrusor pressure recorded at the onset of measured flow (consider time delay—usually under 1 s).

5.3.7.1.4 Maximum detrusor pressure ($P_{det\text{-}max}$, cm H_20)[2]: Maximum registered detrusor pressure during voiding.

5.3.7.1.5 Detrusor pressure at maximum flow ($P_{det\text{-}Qmax}$, cm H_2O)[2]: Detrusor pressure recorded at maximum urinary flow rate.

5.3.7.1.6 Detrusor pressure at end of flow ($P_{det\text{-}ef}$, cm H_2O)[2]: Detrusor pressure recorded at the end of urine flow.

5.3.7.1.7 Postvoiding detrusor contraction[2]: An increase in detrusor pressure (P_{det}) following the cessation of urinary flow ***(NEW)***

5.3.7.2 Detrusor function during voiding cystometry

5.3.7.2.1 Normal detrusor function: Normal voiding in women is achieved by an initial (voluntary) reduction in intra-urethral pressure (urethral relaxation). This is generally followed by a continuous detrusor contraction that leads to complete bladder emptying within a normal time span. Many women will void successfully (normal flow rate and no PVR) by urethral relaxation alone, without much of a rise in detrusor pressure. The amplitude of the detrusor contraction will tend to increase to cope with any degree of bladder outflow obstruction.

5.3.7.2.2 Detrusor underactivity: Detrusor 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 (Figure 20).

5.3.7.2.3. Acontractile detrusor: The detrusor cannot be observed to contract during urodynamic studies resulting in prolonged bladder emptying and/or a failure to achieve complete bladder emptying within a normal time span. The term "*areflexia*" has been used where there is a neurological cause but should be replaced by *neurogenic acontractile detrusor*.

5.3.7.2.4 BOO: This is the generic term for obstruction during voiding. It is a reduced UFR and/or presence of a raised PVR and an increased detrusor pressure. It is usually diagnosed by studying the synchronous values of UFR and detrusor pressure and any PVR measurements. A urethral stricture or obstruction due to higher degrees of uterovaginal prolapse or obstructed voiding after stress incontinence procedures are among possible causes.

7 | SECTION 6: IMAGING FOR PFF AND PFRD

This section profiles the imaging methods used worldwide in the evaluation of PFF and PFRD and defines the utility of each. Within the range of modalities, access and utilization will vary depending on global location, level of health system capacity in each country, and level of local facilities within countries. Imaging methods and PFF/PFRD applications defined here are radiologic, ultrasound, magnetic resonance and CT methods.

6.1 Ultrasound imaging

6.1.1 Ultrasound 2-D methods

6.1.1.1. Transabdominal (T-A)[1]: Curvilinear scanning applied to the abdomen.

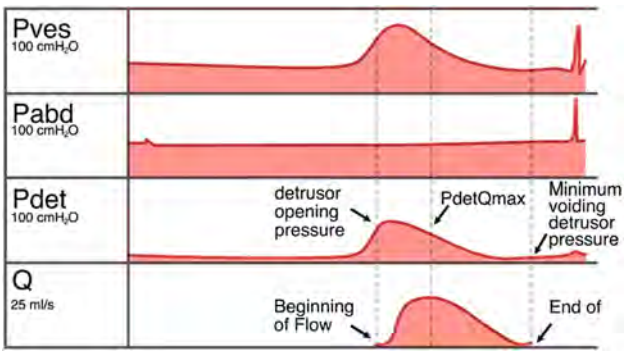

FIGURE 20 A schematic diagram of a pressure-flow study and pressure-flow parameters

6.1.1.2 Perineal[1]**:** Curved array probe applied to the perineum. Includes trans-perineal and trans-labial ultrasound.

6.1.1.3 Introital[1]: Sector probe applied to the vaginal introitus.

6.1.1.4 Transvaginal (T-V)[1]: Intravaginal curvilinear, linear array, or sector scanning.

6.1.2 Ultrasound imaging 2-D PFF and PFRD applications

6.1.2.1 Bladder neck descent/mobility

6.1.2.1.1 Urethral funneling: That is, opening of the proximal third of the urethra during coughing or on Valsalva. ***NEW***.

6.1.2.1.2 Urine loss: Full urethral opening during coughing, Valsalva, bladder contraction or micturition. ***NEW***

6.1.2.2 Post void residual (PVR)[1,2,45–47]: See Section 5.3.5 in investigations.

6.1.2.3 Bladder and urethral masses/foreign bodies[1]: Stone, tumor, foreign body or diverticula.

6.1.2.4 Uterine, adnexal (upper genital tract) pathology[1]—Masses

6.1.2.5 POP[1,3]: Visualization of descent of the bladder, cervix/uterus and rectum during Valsalva and coughing

6.1.2.7 Uterine version[1,3]: Anteverted, retroverted, flexion at isthmus (retroflexion)

6.1.2.7 Postoperative findings[1,3,9]: For example, bladder neck position and mobility, position of meshes, tapes, or implants.

6.1.2.8 Pelvic floor/levator ani muscle: Voluntary control, defect ("avulsion") and ballooning.[48,49]

6.1.2.9 Bladder wall thickness, and ultrasound estimated bladder weight (UEBW). UEBW is higher in women with DO.[50]

6.1.3 Ultrasound imaging—3-D methods:

6.1.3.1 Endo-vaginal ultrasound imaging may compress tissues, distorting the anatomy.

6.1.3.2 Trans-anal ultrasound requires an expensive and dedicated transducer, is more uncomfortable and embarrassing.

6.1.3.3 Trans-labial/trans-perineal minimizes tissue distortion and patient discomfort.

6.1.4 Ultrasound imaging 3-D PFRD applications

6.1.4.1 Levator ani muscle (LAM): Trauma, atrophy, ballooning.[48,49]

6.1.4.2 Anal ultrasound (Endosonography): This is the gold standard investigation in the assessment of anal sphincter integrity. There is a high incidence of defecatory symptoms in women with anal sphincter defects.[1,12]

6.1.4.3 Urinary tract pathology: Stones, scarring, diverticula, tumors or foreign bodies.[1,2]

6.1.4.4 Other assessments: Synchronous ultrasound screening of the bladder and/or urethra and measurement of the bladder and abdominal pressure during filling and voiding cystometry.

6.2 Radiologic imaging

6.2.1 Pyelography of the urinary tract: A technique to generate an image of the upper and lower urinary tract by the introduction of radiopaque fluid (intravenous or retrograde via the ureter).[‡‡‡‡‡]

6.2.1.1 Intravenous urography (IVU)[1,2]**:** Provides an anatomical outline of the upper urinary tract, ureters, and bladder as well as the evaluation of the kidney function and excretion of contrast media (Figure 21).

6.2.1.2 Retrograde urethrocystography and voiding cystourethrography[1,2]**:** Unidirectional or combined contrast imaging of the urethra in a patient in the 30-degree oblique position to visualize the lumen mainly to diagnose urethral strictures or diverticulum. It is also of use to diagnose and stage urethral trauma.

6.2.1.3 Retrograde pyelograms: May be performed when an IVU does not clearly define the anatomy of a suspected ureteral fistula.

6.2.2 Video UDS[1,2]**:** A functional test of the lower urinary tract in which filling cystometry and pressure-flow studies are combined with real-time imaging of the lower urinary tract[2] (Figure 22).

6.2.3 HSG: Is an imaging test to assess the endometrial cavity and fallopian tubes by introducing radiopaque fluid into the uterus. It may be used as an investigation for urinary and colorectal fistula tract into the uterus/cervix. ***NEW***

6.2.4 Contrast enema: Is used to identify colonic pathology.[12] It is a retrograde radio-opaque imaging technique that may assist in the diagnosis of an anorectal tract fistula. Due to the open anorectal tract preventing

FIGURE 21 (Right) Ureterovaginal fistula in a woman with a watery vaginal discharge. Video urodynamics was normal, but IVU shows obstruction of the left ureter (probably due to adjacent surgical clip (arrow), as well as a fistula, which is faintly outlined by contrast material and resultant opacification of the vagina. © L J Romanzi

FIGURE 22 (Left) Video urodynamics showing vesico-vaginal Fistula. © L J Romanzi and Badlani (L'Hopital Nacional de Reference, Niamey, Niger 2003)

FIGURE 23 Computed tomography urogram showing fistula between the bladder and the vaginal vault. © S Elneil

full luminal distension with radio-opaque contrast, a barium enema is prone to false-negative images following subsequent evacuation.[12]

6.3 CT

6.3.1 CT urogram (CT-U)[2]: CT study of the urinary tract system using injected intravenous contrast, used to clarify diagnoses such as (i) tumors; (ii) renal disease; (iii) abnormal fluid collections/abscesses (iv) bladder pathology.

6.3.2 CT Kidneys, ureter, bladder (CT-KUB)[2]: Non-contrast study aimed primarily at identifying stones but may identify other pathology. Also known as "stone protocol."

6.3.3 CT Imaging for fistula: CT role is limited for imaging fistulas due to irradiation load on the patient combined with poor CT resolution of soft tissues. Radiopaque contrast improves soft tissue resolution. However multi-planar spiral CT provides accurate visualization of the pelvic floor soft and bony structures by reconstruction of axial images using 1 mm thick slices without gaps that provides high pelvic floor diagnostic accuracy (i.e., LAM trauma or fistula) (Figure 23). ***NEW***

6.4 MRI: In PFF, MRI maybe used to demonstrate concurrent conditions, such as urethral diverticulum and non-palpable abscesses. Though restricted in availability in low resource regions, where available, MRI imaging is helpful in cases of complex fistulas with adjacent organ system pathology.

8 | SECTION 7: DIAGNOSIS

7.1 Urinary tract PFF diagnoses:

7.1.1 Definition: A diagnosis made by symptoms of a urinary tract fistula**,** signs of extraurethral leakage assisted by a probe or irrigant fluids (dye test), with imaging as required. ***NEW***

7.1.2 Genito-urinary tract fistula: An abnormal connection between the genital tract and urinary tract.[§§§§§]***NEW***

7.1.2.1 Specific diagnoses for lower urinary tract may include:

7.1.2.1.1 Deficiency of the urethra or urethrovaginal fistula (UVaF—see 2.1.1 and 4.3.2.1): Abnormal connection between the urethra and the vagina. ***NEW***

7.1.2.1.2 Vesicovaginal fistula (VVaF—see 2.1.2 and 4.3.2.2): Abnormal connection between the bladder and the vagina. ***NEW***

7.1.2.1.3 Vesico-vaginal-vault fistula (VVtF—see 2.3.3): Abnormal connection between the bladder and vaginal vault (cuff after hysterectomy).

7.1.2.1.4 VCxF (see 2.4.1 and 4.3.2.3): Abnormal connection between the bladder and the cervix. ***NEW***

7.1.2.1.5 VUtF (see 2.4.2 and 4.3.2.3): Abnormal connection between the bladder and the body of the uterus. ***NEW***

7.1.2.2 Specific diagnoses for upper urinary tract may include:

7.1.2.2.1 UrVaF (see 2.1.4): Abnormal connection of ureter into the vagina. ***NEW***

7.1.2.2.2 Uretero-cervical fistula (UrCxF—see 2.5.3): Abnormal connection of the ureter into the uterine cervix. ***NEW***

7.1.2.2.3 UrUtF (see 2.5.3): Abnormal connection of the ureter into the body of the uterus. ***NEW***

7.1.3 CoVF (see 2.7.1 and 4.3.2.4): Abnormal connection between the bladder and either or both of the rectum and colon. ***NEW***

7.1.4 Single or multiple fistula sites: The fistula may occur at a single or multiple sites with or without an ano/rectal/colo – fistula. ***NEW***

7.2 Anorectal tract PFF diagnoses

7.2.1. Definition: A diagnosis made by symptoms of an anorectal, signs of extra-anal leakage of feces or flatus, assisted by a probe or irrigant fluids (dye test), with imaging as required. ***NEW***

7.2.2 Genito-anorectal fistula: An abnormal connection between the genital tract (vagina/uterus/cervix) and the anorectum.[******] ***NEW***

7.2.3 Specific diagnoses: may include:

7.2.3.1. Deficient perineum/total perineal defect: A spectrum of tissue loss from the perineal body and rectovaginal septum with variable appearance. There can be a common cavity made up of the anterior vagina and posterior rectal walls or just an extremely thin septum between the anorectum and vagina. ***NEW***

7.2.3.2 Fourth degree perineal tear (4^0PT—see 2.6.1.2): Defined as an acquired childbirth injury and a subset of deficient perineum, involving both loss of the rectovaginal septum, full thickness anterior defect of the anal sphincter, and variable loss with lateral displacement of the fibromuscular architecture of the perineal body (cloacal-like defect). ***NEW***

7.2.3.3 Rectovaginal fistula (RVaF—see 2.6.2 and 4.4.4): Abnormal connection between the rectum and the vagina.

7.2.3.4 Recto-cervical fistula (RCxF—see 2.6.3): Abnormal connection between the rectum and the uterine cervix. ***NEW***

7.2.3.5 Recto-uterine fistula (RUtF—see 2.6.3): Abnormal connection between the rectum and the body of the uterus. ***NEW***

7.2.4 Complex recto-utero-cervical fistula

7.2.4.1 RVaPeF (see 2.6.2.3): An abnormal connection from the anal canal to the vagina or perineal area. ***NEW***

7.2.4.2 Recto-vesical fistula (RVF same as VRF—see 4.4.7): Abnormal connection between the bladder and the rectum. ***NEW***

7.2.4.3 Recto/colo-uterine/cervical fistula (RCoUtF/RCoCxF—see 4.4.5): An abnormal connection between the colo/rectum and uterus (body and/or cervix). ***NEW***

7.2.5 FIA (see 2.6.4 and 4.4.8): An abnormal connection between the anal canal epithelium (or rarely rectal epithelium) and the skin epithelium. ***CHANGED***

7.2.6 Single or multiple fistula sites: The fistula may occur at a single or multiple sites with or without a urinary tract fistula. ***NEW***

7.3 Incontinence diagnostic categories

Fistula patients are typically pooled into three broad global health treatment outcome categories.[48] These are:

7.3.1 Fistula closed and continent: Fistula closed after treatment (surgical or nonsurgical) without persistent or residual incontinence of the organ system (urinary tract or anorectal tract) that had the fistula. ***NEW***

7.3.2 Fistula closed and incontinent: Fistula closed after treatment (surgical or nonsurgical) with persistent or residual incontinence of the organ system (urinary tract or anorectal tract) that had the fistula. ***NEW***

7.3.3 Fistula not closed: Fistula not closed during or after treatment (surgical or nonsurgical). Not-closed fistula have defined subcategories including: ***NEW***

7.3.3.1 Persistent fistula diagnosis (see 3.4.1): Fistula that is not closed at conclusion of surgical or nonsurgical intervention or that re-opens in the immediate postintervention period. These treatment failures result from acute failure of wound healing or, in the specific case of failure to close the defect during surgical interventions, intra-operative failure of surgical technique. ***NEW***

7.3.3.2 Recurrent fistula diagnosis (see 3.4.2): Fistula that is closed post treatment, but recurs due to delayed failure of wound healing, or occurs subsequent to a follow-on index fistula-causing event. Subsequent index acquired fistula events are most commonly childbirth, surgery or pelvic trauma, but may also be inflammatory disease, infections, and pelvic malignancy. ***NEW***

7.4 Woman deemed incurable (WDI)

7.4.1 WDI diagnosis (see 3.5.7): Women with primary, persistent, and recurrent fistula for which anatomic repair is not possible. WDI require either supportive management and/or a diversion procedure, or they have a fistula complexity that exceeds the capacity(s) of the highest available surgical facility.[††††††,‡‡‡‡‡‡,§§§§§§]

7.5 PFRD functional urinary diagnoses

Storage dysfunction (SD)[2] Those diagnoses related to abnormal changes in bladder sensation, detrusor pressure, or bladder capacity during filling cystometry.

Bladder Factor

7.5.1 Bladder oversensitivity (BO—see 5.3.6.8.1)[1,2]

7.5.1.1 Definition[1,2]**:** Bladder oversensitivity, a clinical diagnosis made by *symptoms and urodynamic investigations* is defined as increased perceived bladder sensation during bladder filling with specific cystometric findings of (i) early first desire to void; (ii) early strong desire to void, which occurs at low bladder volume; (iii) low maximum cystometric bladder capacity; and (iv) no abnormal increases in detrusor pressure. Specific bladder volumes at which these findings occur vary in different populations.

7.5.2 DO (see 5.3.6.9.2)[2]

7.5.2.1 Definition[1,2]: This diagnosis by *symptoms and urodynamic investigations* is made in individuals with LUTSs, more commonly overactive bladder symptoms when detrusor muscle contractions occur during filling cystometry.

7.5.2.2 Subtypes

(i) Idiopathic (primary) DO[2] (see 5.3.6.9.2.1): No identifiable cause for the involuntary detrusor contraction(s).

(ii) Neurogenic (secondary) DO[2] (see 5.3.6.9.2.2): There is DO and evidence (history; visible or measurable deficit) of a relevant neurological cause.

(iii) Non-neurogenic (secondary) DO[2] (see 5.3.6.9.2.3): An identifiable possible non-neurological cause exists for involuntary detrusor contraction(s) during bladder filling. e.g. functional (obstruction); stone, tumor, UTI.

7.5.3 Reduced compliance storage dysfunction (RCSD—see 5.3.6.9.3)[2]: A diagnosis by *symptoms and urodynamic investigations* is made in individuals with LUTSs, more commonly storage symptoms, when there is a non-phasic (at times linear or exponential) rise in detrusor pressure during filling cystometry with generally reduced capacity indicating reduced compliance.

7.5.3.1 Reduced compliance (RCSD) incontinence[2]: Urinary incontinence directly related to the RCSD.

7.5.4 Outlet Factor (Urethra/Sphincter dysfunction—decreased urethral resistance—incompetence/insufficiency)

7.5.4.1 USI (see 5.3.6.10.3)[1,2]

7.5.4.1.1 Definition[1,2]: A diagnosis by *symptom, sign and urodynamic investigations* involves the finding of involuntary leakage during filling cystometry, associated with increased intra-abdominal pressure, in the absence of a detrusor muscle contraction.

7.5.4.1.2 Subtype: ISD (see 5.3.6.10.4)[2]: Very weakened urethral closure mechanism.

Voiding dysfunction (VD)[2]: Those diagnoses related to abnormally slow and/or incomplete bladder emptying manifest as an abnormally slow UFR and/or an abnormally high PVR with confirmation by pressure-flow studies (including any related imaging).

7.5.5 Bladder factor—(Poor or absent detrusor activity)

7.5.5.1 Detrusor underactivity (DUA—see 5.3.7.2.2)[2]

7.5.5.1 Definition of DUA[2] A diagnosis based on *urodynamic investigations* generally (but not always) with relevant *symptoms* and *signs* manifest by low detrusor pressure or short detrusor contraction in combination with a low UFR resulting in prolonged bladder emptying and/or a failure to achieve complete bladder emptying within a normal time span, with or without a high PVR (c.f. "hypocontractile detrusor"—detrusor contraction of reduced strength)

7.5.5.2 Detrusor acontractility (DAC—see 5.3.7.2.3)[2]

7.5.5.2.1 Definition of DAC[2]: A diagnosis by *urodynamic investigation*, generally (but not always) with relevant *symptoms* and *signs* manifest by the absence of an observed detrusor contraction during voiding studies resulting in prolonged bladder emptying and/or a failure to achieve complete bladder emptying within a normal time span.

7.5.5.2.2 Subtypes

7.5.5.2.2.1 Neurogenic detrusor acontractility[2]

7.5.5.2.2.2 Non-neurogenic detrusor acontractility[2]

7.5.6 Outlet factor (urethral/sphincter dysfunction)

7.5.6.1 Bladder outlet obstruction (BOO)[2]

7.5.6.1.1 Definition of BOO[2]: A diagnosis based on *urodynamic investigations (pressure-flow studies ± imaging),* generally (but not always) with relevant *symptoms*and/or *signs,* manifest by an abnormally slow UFR with evidence of abnormally high detrusor voiding pressures and abnormally slow urine flow during voiding cystometry with or without an abnormally high PVR.

7.5.6.1.2 Possible sites/causes of BOO: Can be:

5.4.1.2.1 Functional[2]: Bladder neck obstruction, detrusor sphincter dysfunction, pelvic floor overactivity. ***NEW***

5.4.1.2.2 Mechanical[2]: Urethral stricture, meatal stenosis. Video UDS can sometimes be required to ascertain the cause/site.

7.5.7: Alternate presentations of voiding dysfunction

7.5.7.1 Acute retention of urine[2]: An individual is unable pass any urine despite having a full bladder, which on examination is painfully distended, and readily palpable and/or percussible. ***CHANGED***

7.5.7.2 Chronic retention of urine[2]: Generally (but not always) painless and palpable or percussible bladder, where there is a chronic high PVR. The patient experiences slow flow and chronic incomplete bladder emptying but can be asymptomatic. Overflow incontinence can occur.

7.5.7.3 Acute on chronic retention[2]: An individual with chronic retention goes into acute retention and is unable to void.

7.5.7.4 Retention with overflow[2]: Involuntary loss of urine directly related to an excessively full bladder in retention.

7.6 PFRD—OTHER DIAGNOSES

7.6.1 POP[1,3] (see 3.7)

7.6.1.1 Definition: A diagnosis by *symptoms and clinical examination, assisted by any relevant*

imaging, involves the identification of descent of one or more of the anterior vaginal wall (central, paravaginal or combination cystocele), posterior vaginal wall (rectocele), the uterus (cervix) or the apex of the vagina (vaginal vault or cuff scar) after hysterectomy. The presence of any such sign should correlate with relevant POP symptoms.

7.6.2. Recurrent UTIs[1] (see 3.6.3)

7.6.2.1 Definition: A diagnosis by *clinical history* assisted by *the results of diagnostic tests* involves the determination of the occurrence of at least three symptomatic and medically diagnosed UTI over the previous 12 months.

7.6.3 Anorectal incontinence (see 3.10.10):

7.6.3.1 Definition: a diagnosis is by *symptoms and clinical examination* assisted by the results of *investigations* (anorectal manometry) and *imaging* (endoanal ultrasonography). At times, endoscopic evaluation may be required. ***NEW***

7.6.3.2 Sphincteric anorectal incontinence: Anal sphincter defects or weakness are present. ***NEW***

7.6.3.3 Urge anorectal incontinence: Incontinence is due to involuntary anorectal spasms. ***NEW***

7.6.3.4 Artefactual anorectal incontinence: Infective, inflammatory or neoplastic etiology is identified. ***NEW***

9 | SECTION 8: CONSERVATIVE (NONSURGICAL) MANAGEMENT[51-53]

8.1 Conservative management[13]: Restricted to nonsurgical and nonpharmacological treatments.

8.2 Lifestyle interventions

8.2.1 Indications: Lifestyle intervention may be optimized to manage the chronic incontinence in:

8.2.1.1 Nonsurgical: Women who are not candidates for surgical treatment. ***NEW***

8.2.1.2 Surgery not preferred: Women who prefer not to undergo surgical treatment. ***NEW***

8.2.1.3 Urinary catheter not possible: Women who are also not candidates for nonsurgical catheter treatment. ***NEW***

8.2.2 Types of lifestyle interventions (urinary incontinence)

8.2.2.1 Skin protection: Protective dermal emollients to reduce dermatitis on the vulva, legs and feet. ***NEW***

8.2.2.2 Pads: Adequate, preferably reusable, large pads or adult diapers.[13]

8.2.2.3: Urethral plugs[13,54]: Products to block the urethral meatus in women with stress urinary incontinence after fistula closure. ***CHANGED***

8.2.2.4 Vaginal lubricants[13]: Pharmacological preparations aimed at reducing friction during coital or any other sexual activity and therefore alleviating dyspareunia, or at least reducing discomfort associated with clinical examination of the vagina or rectum. Pharmacological and natural plant-based oils may be used.

8.2.2.5 UTI prophylaxis: Prophylactic antibiotics/antibacterial (e.g. hexamine hippurate) to reduce the incidence of recurrent or postcoital UTI.

8.2.3. Types of lifestyle interventions (anorectal incontinence) Anorectal lifestyle interventions include:

8.2.3.1: Dietary modification: To minimize flatus and loose-liquid stool. ***NEW***

8.2.3.2: Skin protection: Protective dermal emollients for the vulva, legs, and feet. ***NEW***

8.2.3.3: Pads: Adequate, preferably reusable, large pads or adult diapers.[13]

8.2.3.4: Vaginal lubricants[13]: Pharmacological preparations aimed at reducing friction during coital or any other sexual activity and therefore alleviating dyspareunia, or at least reducing discomfort associated with clinical (per vagina or per rectum examination). Pharmacological and natural plant-based oils may be used.

8.3 Catheter insertion

Inserting a catheter when an acute lower urinary tract injury is diagnosed may result in closure of the fistula, or reduced size of the fistula before subsequent surgical intervention.[52]

8.3.1 Bladder catheterization: May be used for secondary prevention or nonsurgical treatment of bladder fistula.[55] ***NEW***

8.3.2 Ureteral catheterization (cystoscopic): May be used for secondary prevention or nonsurgical treatment of ureteric fistula. Care must be taken to evaluate the healed ureter for secondary ureteric stenosis that may result in secondary obstructive nephropathy after fistula treatment. ***NEW*** Ureteric catheterization may be used during the repair of vesicovaginal and ureteric fistulas. It is not a treatment for ureteric fistulas.

8.4 Physical therapy

8.4.1 Pelvic physiotherapy—General: Assessment, prevention, and/or treatment of pelvic floor dysfunction, performed by a pelvic physiotherapist. The therapy aims at reducing symptoms of fistula and post-fistula treatment incontinence symptoms as well as improvement of pelvic floor function.[56] The role of continence nurses amongst other allied health professionals in performing some of these specialized therapies is acknowledged.

8.4.2 Other therapies: Covers many specialized therapies that can be used to train the pelvic floor including[13]:

8.4.2.1 Therapeutic exercise[13]: Consists of interventions directed toward maximizing functional capabilities.

8.4.2.2 Cognitive behavioral therapy[13]**:** Cognitive techniques used in association with behavior therapy principles.

8.4.2.3 Bladder training[13]: Consists of a program of patient education, along with a scheduled voiding regimen with gradually adjusted voiding intervals.

8.4.2.4 Bowel habit training[13]**:** Is aimed at establishing a regular, predictable pattern of bowel evacuation by patient teaching and adherence to a routine to achieve a controlled response to bowel urgency.

8.4.2.5 Muscle training[13]: Exercise to increase muscle strength, endurance, flexibility or relaxation.

8.4.2.6 Coordination training[13]**:** Is the ability to use different parts of the body together smoothly and efficiently.

8.4.2.7 Biofeedback[13]: The use of an external sensor to give an indication with regard to bodily processes, usually with the purpose of changing the measured quality.

8.4.2.8 Electrical muscle stimulation[13]**:** Is the use of electric potential or currents to elicit therapeutic responses. Current may be directed at motor or sensory functions.

In those fistula patients with flexure injuries, and/or foot drop, musculo-skeletal physiotherapy can be helpful in preparing the patient for surgery.

10 | SECTION 9: SURGICAL MANAGEMENT

9.1 General fistula surgical terminology

9.1.1 Biological grafts[9]**:** Any isolated healthy tissue for transplantation into fistulous area to augment or strengthen the repair.

9.1.1.1 Autologous grafts[9]**:** From patient's own tissues, for example, rectus sheath or fascia lata.

9.1.1.2 Allografts[9]**:** From post-mortem human tissue banks. Not often used in fistula surgery e.g. fascia lata.

9.1.1.3 Xenografts[9]**:** From other species, for example, modified porcine dermis, porcine small intestine, and bovine pericardium. Occasionally used in fistula surgery.

9.1.2 Autologous grafts and flaps

9.1.2.1 Labia majora fat-flap: The use of labial fibro-adipose tissue underneath the labia majora [*******](Figure 24). ***NEW***

9.1.2.2 Labia minora flap: The use of labia minora to provide a skin flap to help reconstruct the vagina. ***NEW***

9.1.2.3 Buttock and perineal skin rotation flaps: The use of skin flaps from the buttock/perinea area to provide interposition fat and blood supply as well as increased vaginal skin surface area. ***NEW***

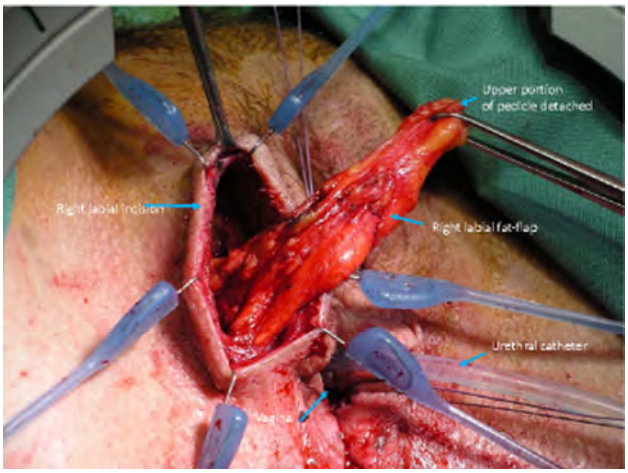

FIGURE 24 Labial fat-flap mobilized from the right labium (© J Goh)

9.1.2.4 Peritoneal grafts and flaps: The use of peritoneum flap/graft to provide interposing tissue and blood supply as well as increased vaginal non-dermal surface area. It may be used at vaginal or abdominal surgery. ***NEW***

9.1.2.5 Omental flap: The use of omentum to provide interposing fat and blood supply during abdominal surgery. ***NEW***

9.1.2.6 Muscle flap: The use of muscle, for example, gracilis muscle or rectus abdominus muscle flap to provide tissue and blood supply. ***NEW***

9.1.2.7 Rectal advancement flap: Mobilize/elevating a flap of the rectum above/below the fistula and using the flap to close over the fistula. ***NEW***

9.1.2.8 Singapore flap (pudendal thigh/groin vasculocutaneous flap): For vaginal reconstruction (not dissimilar to 9.1.2.3).

9.1.2.9 Colonic flaps: For vaginal reconstruction of a large PFF in the presence of complete vaginal loss.

9.2 Fistula repair surgery

9.2.1 Minor fistula surgery

9.2.1.1 Cystoscopic cauterization of fistula: Cauterization of the fistula under direct vision via cystoscopy. Used for tiny fistulas and may succeed. This is usually combined with prolonged catheter drainage. Theoretically, light (judicious) cautery of the fistula, allowing the bladder and vaginal tissues to heal (Figure 25). ***NEW***

9.2.1.2 Debridement of fistula: Defined as removal of damaged tissue or foreign objects from a wound. May successfully be engaged as a primary therapy for small fresh RVaF and adjunctively for nonsurgical catheter treatment of VVaF.[50] ***NEW***

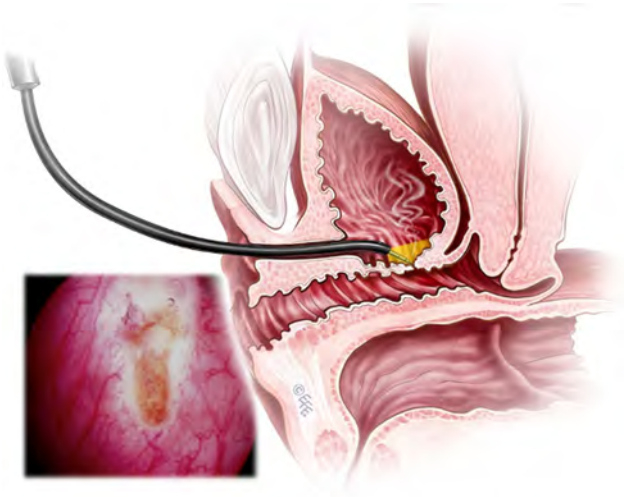

FIGURE 25 Light (judicious) fulguration of the fistula. (left) ©G Ghoniem (right) © Levent Efe

9.2.2 Major fistula repair surgery

Principles of all fistula surgery include:

9.2.2.1 Patient counseling: On the possibility of complications, including failure, and staged care. ***NEW***

9.2.2.2 Optimizing patient health: Operating on patients who are in optimal health for wound healing. ***NEW***

9.2.2.3 Tissue handling: Careful tissue handling during dissection and suturing. ***NEW***

9.2.2.4: Wide dissection to well-mobilize the fistulized organs from each other. ***NEW*:**

TABLE 1 Total, new and changed definitions (compared with previous definitions in the ICS glossary)

Section	New definitions/ descriptors	Changed definitions/ descriptors	Total
Introduction, etiology	16	0	16
Classification	27	0	27
Symptoms	22	0	90
Signs	45	3	56
Investigations	11	0	71
Imaging	4	0	31
Diagnoses	37	0	64
Conservative management	10	1	29
Surgical management	16	0	32
Total	188 (45%)	4 (1%)	416

9.2.2.5 No tension: Close the fistula defects under no tension. ***NEW***

9.2.2.6: Flaps and grafts: Judicious use of autologous interposition flaps and grafts to assure adequate blood supply for wound healing. ***NEW***

9.2.2.7: Optimize functional result: Attention paid to both form (close the hole) and function (restore normal function to the urinary, genital and anorectal tracts). ***NEW***

9.2.2.8 Intercurrent prolapse and incontinence surgery: Including but not limited to judicious use of prolapse reconstructive and incontinence procedures for concurrent pelvic floor disorders during the fistula repair. ***NEW***

9.2.2.9 Bladder drainage: Catheterization

9.3 Measuring outcome in PFF surgeries[11]

As per IUGA-ICS Report on outcome measures for pelvic floor surgery,[11] every study evaluating pelvic floor surgery should report.

9.3.1 Perioperative data[11]: That is, blood loss, operating time, length of hospital stay, return to normal activities, and complications.

9.3.2 Subjective (patient-reported) outcomes[11]: At its simplest level, this can be reported as the presence or absence of urinary/fecal incontinence. Patient satisfaction and quality of life can be measured by validated instruments that cover fistula, prolapse, urinary, bowel, and sexual function. Reproductive outcomes are also a consideration: for example, menstruating, able to conceive and carry a pregnancy to term.

9.3.3 Objective outcomes[11]**:** PFF-staging measurements tabulated with absolute values and percentages to allow other studies to compare results.

9.3.4 Secondary outcomes[11]**:** For example, LUTS, stress urinary incontinence or bowel and sexual dysfunction, in their studies whenever possible.

9.3.5 Surgery type:

9.3.5.1 Primary surgery[11]: Indicates the first procedure required for treating PFF in any compartment.

9.3.5.2 Further surgery[11]: Provides a term for any subsequent procedure relating to primary surgery. Further surgery is subdivided into:

9.3.5.2.1. Primary surgery in a different site/compartment.

9.3.5.2.2. Repeat surgery in the same site/compartment for PFF symptom recurrence.

9.3.5.2.3. Surgery for complications, for example, pain, infection, recurrent/persistent incontinence, or hemorrhage.

9.3.5.2.4. Surgery for non-PFF-related conditions usually prolapse, new onset urinary (e.g. stress urinary incontinence), or flatal/fecal incontinence.

9.3.6: Complications of PFF surgeries

Complications related to PFF native tissue repair and surgeries using graft have been classified separately according to joint IUGA/ICS recommendation.[10] The system used in both documents utilizes specific category, time, and site taxonomy together referred as *CTS (Category, Time, Site) classification system*.

Classification is aided by on line calculators at either http://www.ics.org/complication or http://www.ics.org/ntcomplication.

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ENDNOTES

* Total perineal defect: see Section 2.

† Total perineal defect[12]: A spectrum of tissue loss from the perineal body and rectovaginal septum with variable appearance.

‡ Recto(colo)-ureteric fistula is created electively after ureteric diversion into the bowel for the management of PFF but can occur following colorectal surgery for cancer and inflammatory pathologies.

§ There are multiple classification systems published. Section 2.8 briefly mentions the more commonly used systems. Commonly used anatomical descriptions of PFF such as "urethral," "mid-vaginal," and "juxta-cervical" are terms from various published classification systems (see Goh et al.[23,24] for a more extensive review). There is currently no consensus on a classification for PFF and a comprehensive review on published classification systems was undertake previously.[23] Below are commonly used PFF classifications.

** Classification System A: The Francophone System,[24,25] developed in 1959, has been for use in urinary tract PFF and is used in Francophone (French-influenced) Africa. It divides the fistula into "simple," "complex," or complicated with significance placed on destruction of bladder neck, urethra, and scarring. It is the original classification system that was translated into English to create the basis for the Waaldijk classification system.

†† Classification System B: The Waaldijk System,[26] published in 1995, is based on whether the continence mechanism is impaired and on the extent of circumferential damage. In the original paper, the classification of the fistula was performed under anesthesia. Type I fistulas do not involve 'the closing mechanism' whilst Type II involves "the closing mechanism." The definition of the "closing mechanism" is unclear. Type III are ureteric and "other exceptional fistulas." There is a subclassification according to the size of the fistula. Studies have been conducted to assess this system. Comparative study with other systems demonstrates the Waaldijk system to be less predictive of closure.

‡‡ Classification System C: The Goh System,[27] published in 2004, is based on fixed reference points. The external urinary meatus (or its site if the urethra is absent) is the reference point for genito-urinary

fistulas and the hymen is the reference point for anorectal-vaginal fistulas. This system is based on distance from these fixed reference points, size of the fistula, presence of scarring, and other "special" circumstances such as radiation fistulas, circumferential fistulas, recurrent fistulas. Published studies using this system include intra- and interobserver concordances,[28] correlations with urinary incontinence after surgical closure and grade of fistula[29] and comparative studies with other systems.[30]

§§ Classification System D: The Panzi Hospital System,[31] published in 2018, is also known as the Panzi score. It is a descriptive and predictive scoring system based on retrospective review of surgical failure of fistula repair using characteristics from the Goh[27] and Waaldjik[26] systems. A scoring system was constructed by using the data obtained, correlating the score to likelihood of surgical outcomes. The score is based on whether the fistula is circumferential, the location and size of the fistula.

*** About 1 in 4 women complains of ongoing urinary incontinence after successful fistula closure.[29] Urodynamic studies were performed in 149 women with post-fistula incontinence.[34] The most common diagnoses were urodynamic stress incontinence in 49%, mixed urodynamic stress incontinence and detrusor overactivity in 43%. Seven percent of women had a postvoid residual urine of 150 ml or more (which is high and significant, particularly in a partially destroyed bladder that has a maximum capacity of 150 ml).

††† Women deemed incurable: In some facilities, this includes women with severe incontinence symptoms after successful fistula closure. These women also fall under "closed and Incontinent" category.

‡‡‡ It is important to take into consideration past history during examination and evaluation of the fistula e.g. radiation therapy. The signs will be documented according to anatomic findings.

§§§ Although the fistula is described from discrete anatomical sites, the fistula may involve 2 or more sites e.g. urethro-vesico-vaginal fistula. A "vault/cuff fistula" is often a name given to a post-hysterectomy fistula from the bladder to the vagina. A "vault/cuff fistula" is a vesico-vaginal fistula.

**** Urethro-vaginal fistula: There may be a common cavity made up of the anterior vaginal wall with a defect at or above the level of the bladder neck, indicative of total loss of the urethra (anterior and posterior walls) in the most extreme form – very difficult to cure. Lesser urethral deficiencies may involve variable degrees of loss of the urethra distal to the bladder neck, or congenital or acquired hypospadias.

†††† Uretero-colonic fistula—This may be iatrogenic after ureteric diversion into the bowel for example, in the management of women with complex recurrent or persistent urinary fistula symptoms.

‡‡‡‡ PFRD signs can result from neuropraxia of the sacral nerve roots (which control lower extremity function as well as bladder/bowel function), pelvic fibrosis, vaginal stenosis, cervical atrophy or stenosis, diastasis, or exposure of the pelvic bones.

§§§§ In such cases, it is common for intraoperative post-closure blue test to be negative, with clear urine pooling in the fornix, indicating persistence of an upper urinary tract (ureteric) fistula that may not have been diagnosed presurgery.

***** Cystoscopy may also be used to:

- Evaluate suspected upper urinary tract fistula of the ureters through retrograde pyelography, to insert ureteric catheters at the time of repair of small lower urinary tract fistula that are in proximity to the ureters
- To undertake ureteric catheter insertion for nonsurgical treatment of ureteric fistula.
- To evaluate persistent fistula-related disorders of the lower urinary tract, such as poor bladder compliance and reduced bladder capacity, foreign bodies, bladder, and urethral diverticula, neurogenic bladder, and drainpipe urethra.
- Ureteroscopy may be used to diagnose ureteric fistula and to assess for PFRD co-morbidities of ureteric fibrosis and stenosis or ureteric stones through direct visualization.

††††† Lower urinary tract symptoms (LUTS) may occur after closure of a lower urinary tract (bladder or urethra) fistula or may co-exist and persist after repair of an upper urinary tract (ureteric) or anorectal tract fistula. For persistent fistula-related disorders (PFRD) of the lower urinary tract, multi-channel urodynamics may be employed to evaluate complex bladder dysfunction symptoms that persist or occur de novo after successful PFF repair. It is understood that these may be aspirational investigations/technologies in many resource-constrained communities.

‡‡‡‡‡ Intravenous (antegrade) or retrograde pyelography may be used to evaluate for upper and lower urinary tract fistulas, urethral diverticulum, tumors, strictures, stenosis, stones, foreign bodies, hydronephrosis, hydro-ureter and other upper and lower urinary tract disease, for example, medullary sponge kidney.

§§§§§ The diagnosis of urinary tract PFF may be defined by the anatomical location of the fistula (see Section 4), for example, urethra-vaginal fistula. Larger fistulas often occur over more than one anatomical site, for example, involving both urethra and bladder.

****** The diagnosis of anorectal tract PFF may be defined by the anatomical location of the fistula (see Section 4) but larger fistulas may occupy more than one anatomical site.

††††††† The making of a WDI diagnosis is often, but not always, conditional. Of all categories, this is perhaps the most difficult diagnostic group and will be discussed further. Women in this category suffer with fistulas that are beyond the health system's capacity to repair in an anatomically normal way, or who are unable or unwilling to undergo diversion of the urinary or anorectal tract for nonanatomic repair of their fistula.The categorization of women with fistula as "incurable" often occurs in the context of evaluation by a single clinician, usually but not always a fistula surgeon of variable level of expertise, working in an under-resourced environment with systems gaps that preclude achievement of a minimum acceptable standard of care for complex, elective reconstructive surgery.[49]The limitations to single-surgeon diagnosis for WDI include[49] (i) informed only by their skills and experience; (ii) criteria not standardized; (iii) patient is often excluded from the decision process; (iv) patient is often not adequately counseled on her health situation.

‡‡‡‡‡‡ It could include those women who have their fistula closed but still remain incontinent despite repeated operations for ongoing incontinence.

§§§§§§ Limitations of WDI Diagnostic Criteria include but are not limited to (i) fistula complexity that precludes reconstruction of normal pelvic anatomy due to significant loss of tissue (bladder,

anorectum, vagina) with or without dense pelvic fibrosis and/or vaginal stenosis; (ii) socio-cultural and/or geopolitical constraints that preclude safe nonanatomic diversion and/or graft-based reconstructive surgery (bladder augmentation, intestinal or other graft source neo-vagina, etc); (iii) health systems constraints that preclude successful service provision of advanced, complex anatomic, or nonanatomic reconstructive surgery including staff (surgeon, anesthetic, nursing), facilities/equipment/infrastructure, accessibility, and affordability.

******* The labia majora fat flap has blood supply both proximally (inferior epigastric and clitoral vessels) and distally (pudendal vessels). The flap may be divided at proximal or distal ends whilst maintaining its blood supply.

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