

Start	End	Topic	Speakers
09:30	09:45	Introduction, pathophysiology and epidemiology of anal incontinence	Alexis Schizas
09:45	10:00	Clinical assessment	Massarat Zutshi
10:00	10:15	Assessment with anal imaging and physiological investigation	Alison Hainsworth
10:15	10:40	Conservative management	Paula Igalada-Martinez
10:40	10:55	Neuromodulation and surgical management	Samantha Morris Massarat Zutshi
10:55	11:00	Discussion	Alexis Schizas Alison Hainsworth Paula Igalada-Martinez Samantha Morris

Aims of Workshop

The aim is to provide an update on the current evidence for best practice in the assessment and treatment of patients with anal incontinence.

Anal incontinence is a common problem which often presents alongside other pelvic floor dysfunction. This workshop will cover the possible reasons behind anal incontinence, current methods for patient assessment and up to date treatment options. This workshop will enable you to understand why a patient may suffer anal incontinence and provide you with the expertise to assess and treat a patient as well as understand when the patient needs to be referred for further intervention.

Learning Objectives

Understand the epidemiology of anal incontinence including its' prevalence, inconsistencies in reported prevalence and the anticipated increase in future prevalence.

Understand the causes and risk factors for anal incontinence. Appreciate that the aetiology for anal incontinence is often multifactorial and that causes other than obstetric anal sphincter injury must also be considered.

Learn how to perform a clinical assessment of a patient with anal incontinence (history, questionnaires, bowel diaries and examination).

Know that investigations such as anorectal physiology and endoanal ultrasound are also useful for assessment. Recognise the relevance of the key findings using these investigations.

Be able to implement an initial conservative treatment plan.

Know when further treatment with neuromodulation or surgery may be beneficial.

Target Audience

Bowel Dysfunction, Conservative Management

Advanced/Basic

Basic

Workshop Outline

Introduction, pathophysiology and epidemiology of anal incontinence

Alexis Schizas – UK

The workshop will open with a short overview of the causes of anal incontinence, who suffers with anal incontinence, its' prevalence and the reasons for increased future prevalence.

Anal incontinence is defined as the recurrent uncontrolled passage of faecal material or flatus.

Pathophysiology: Continence is maintained by the integrity and function of the anorectum. Factors which affect continence are the delivery of stool to the rectum, the ability of the rectum to store faeces, the anal sphincter mechanism, nerve supply and physical mobility. Interruption to any of these mechanisms causes incontinence.

The aetiology of anal incontinence is usually multifactorial. Risk factors include age, nursing home residence, childbirth, diarrhoea, faecal impaction, diabetes, urinary incontinence, neurological and psychiatric disorders, nutritional factors, poor mobility, prolapse, some surgeries and smoking.

Passive anal incontinence - Passive anal incontinence with faecal seepage occurs when the anal canal does not close properly. This may occur due to either damage or weakness of the internal anal sphincter or anal vascular cushions. Damage to the

internal anal sphincter most commonly occurs due to obstetric anal sphincter injury (OASIs). Rectal prolapse may also prevent full closure of the anal canal.

Urge anal incontinence - Urge anal incontinence is the result of the continence mechanisms being overwhelmed; either the rectum cannot distend to act as a reservoir to hold the faecal material or the anal sphincter mechanism cannot contain the stool. For example, radiation may affect rectal compliance (i.e. ability to store faeces) or uncontrolled delivery of stool to the rectum with irritable bowel syndrome may overwhelm continence mechanisms.

Additionally, incomplete evacuation of stool (for example, due to a rectocele) may lead to subsequent post defaecatory seepage.

Epidemiology: Anal incontinence is common, chronic and debilitating and adversely affects quality of life. Despite this its' prevalence is inconsistently reported and its' incidence is seldom referred to.

Prevalence - Prevalence may vary from 1.4 to 19.5%. There is a paucity of high-quality population studies and symptoms are underreported so anal incontinence may be underestimated. Future estimates may increase as the definition of anal incontinence is standardised and barriers to reporting symptoms are broken down.

Incidence - There are some clinical trials which report incidence of anal incontinence following treatment but none which report incidence prior to treatment. Two Cochrane reviews examining the treatment for anal fissure found rates of anal incontinence to flatus varied from 0 to 30% following treatment.

Male/ Female - Previously, it has been assumed that anal incontinence is more common in women and is primarily due to obstetric injury, with either injury to the anal sphincter or pudendal nerve. (Other common contributors include irritable bowel syndrome (more often seen in women) and neurological diseases such as diabetes). However, population studies show that prevalence of anal incontinence is also high in men and so other causes in addition to obstetric injury must also be appreciated.

Future: In the era of increased patient expectation and as barriers to reporting anal incontinence are broken down, it is expected that its' prevalence and demand to treatment will increase. Successful treatment will depend upon a comprehensive understanding of the causes of anal incontinence.

Assessment

A guide to the assessment of the patient presenting with anal incontinence (either as their main presenting complaint or alongside other pelvic floor dysfunction).

This includes clinical assessment (history, examination, questionnaires, bowel diaries) and assessment with tools such as anorectal physiology and endoanal ultrasound. Anal incontinence can be assessed by subjective means (symptom assessment) and objective means (assessment of the anorectal structure and function).

Assessment can be performed at the time of diagnosis, before and after treatment to assess the efficacy of treatment, during treatment to assess an ongoing improvement or to investigate the cause of no improvement or a recurrence of symptoms.

Organic pathology such as malignancy or inflammatory bowel disease must first be excluded.

Clinical Assessment

Massarat Zutshi – USA

The underlying pathophysiology of anal incontinence is multifactorial and so symptoms alone cannot be used to determine treatment¹. However, the assessment of symptoms and how they have changed following treatment is an important indicator of how 'successful' any interventions are.

Symptom assessment can be with patient questionnaires, stool diaries and patient interviews. Symptom assessment includes; severity (frequency and type of incontinence, urgency, avoidance behaviours and adjuncts such as pads, plugs and antidiarrheal medications), amount of bother inflicted, and impact upon quality of life.

Patient questionnaires examine severity, bother and quality of life. Stool diaries examine severity. Patient interviews can allow qualitative assessment of a patients' perception and acceptability of treatments.

There may be difficulty in comparing the results from questionnaires between different populations as concepts of anal incontinence are affected by cultural and psychosocial factors. Patients use avoidance behaviour which leads to underestimation of severity. Some questionnaires assess symptom severity and others quality of life, but few assess both. Often a combination of questionnaires is required for complete evaluation.

Symptom Severity Questionnaires: Examples include the Jorge Wexner score (grades severity and impact upon lifestyle), the St Marks' incontinence score (developed to account for avoidance behaviour adopted to control symptoms), the Revised Faecal Incontinence Scale (a short, psychometrically sound tool) and the Faecal Incontinence Severity Index (a diagnostic tool).

Symptom Severity Questionnaires Designed to Assess Outcomes for Rectal Cancer Treatment: The LARS score and MSKCC bowel function instrument are suitable for in-depth assessment.

Diary Monitoring: Symptom questionnaires may be misleading, only provide a snapshot of bowel habits and fail to reflect day to day variations or the relationship between bowel symptoms and stool form². Bowel diaries are recordings of bowel habits which are widely used in diagnostic and interventional studies³.

Quality of Life Questionnaires: There may be poor correlation between symptom severity and quality of life^{4,5}. Symptom scores alone do not allow satisfactory evaluation of the impact of anal incontinence on quality of life and therefore both aspects of anal incontinence should be assessed⁶. Quality of life can be assessed using generic scales such as the SF36 questionnaire or specific scales such as the Rockwood scale.

The Combined Assessment of Symptom Severity and Quality of Life: The Rapid Assessment Faecal Incontinence Score was developed to quickly assess both severity and impact upon quality of life. The modular international consultation on incontinence questionnaire for bowel symptoms (ICIQ-BS) is a comprehensive, robust, condition-specific self-completion questionnaire to assess bowel symptoms, the bother they cause and their impact on quality of life^{7,8}. It is the top-rated questionnaire for evaluation of symptoms severity and impact on health-related quality of life.

Visual Analogue Scores: Developed to assess the severity of anal incontinence and its' impact upon on quality of life but have not been shown to be a suitable substitute for other scoring systems.

Interview Assessment: Interviews can be used for qualitative assessment and to assess patient acceptability of treatments and patient perception of their symptoms.

Examination: Inspection of the perineum and anus can reveal excoriated skin due to anal leakage, scarring from OASIs, previous surgery or trauma, prolapse, haemorrhoids and an open anus at rest. Digital rectal examination can be used to assess resting and squeeze pressures and muscle co-ordination. Proctoscopy and sigmoidoscopy may be performed to assess haemorrhoids and occult disease, for example malignancy. Rectocele, intussusception and rectal prolapse may be assessed. Vaginal examination may detect concurrent prolapse.

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Assessment with anal imaging and physiological investigation

Alison Hainsworth – UK

Patients' symptoms, the amount of bother experienced and their impact upon quality of life may be considered the most important and relevant assessment tools for anal incontinence. However, anorectal structure and function are also useful measures, particularly in the context of therapeutic trials for anal incontinence. This is because;

- 1) symptom severity may be underestimated by day to day variation in symptoms and patient avoidance of certain activities to reduce incontinent episodes,
- 2) the pathophysiology of anal incontinence is multifactorial and there may be several contributing factors toward symptoms which may not all be solved with a single intervention
- 3) objective parameters may be useful to determine outcomes in uncontrolled studies

- 4) if anal incontinence initially responds to treatment and then symptoms deteriorate there may be failure of treatment or another contributing factor (for example, recurrent incontinence after sacral nerve stimulation due to device malfunction).

Tests of anorectal structure and function include; anal manometry, rectal compliance and sensation with either balloon studies or Barostat, saline continence tests, porridge enema, pudendal nerve terminal motor latency, needle EMG of the external sphincter, endoanal ultrasound and endoanal MRI.

Anorectal Physiology: Includes anorectal manometry, sensory measurements and neurophysiology.

Anorectal Manometry - Anorectal manometry includes conventional anal manometry, high resolution manometry, vector volume manometry and ambulatory manometry. Anorectal manometry measurements include functional anal canal length, squeeze and resting pressures.

Manometry may be useful to evaluate symptoms. For example, in patients with low anterior resection syndrome there is reduced anal pressure which can be treated with biofeedback. The level of incontinence correlates with reduced resting pressure levels¹.

Sensory Measurements - Sensory measurements are made with rectal balloon distention, Barostat and rectal impedance studies. Measurements include rectal sensation (first and urge sensation and maximal tolerated volume) and compliance. Progress after treatment with pelvic floor rehabilitation or rectal sensitivity training with balloon distention can be documented according to the volumes tolerated. However, an improvement in rectal capacity may not be reflected by patients' symptoms.

Neurophysiology - Neurophysiology includes EMG (electromyography) and pudendal nerve terminal motor latency. Measurements include assessment of activity in the external sphincter and puborectalis.

Saline Continence Tests or Porridge Enema: Saline or another liquid (for example porridge) is inserted into the rectum via a catheter and the patient asked to walk around with a pad in for 20 minutes to assess continence.

Imaging:

Endoanal Ultrasound - Used to assess the integrity of the anal sphincter complex. Obstetric anal sphincter injuries can be identified and graded. Endoanal ultrasound may be used pre and post-surgical sphincter repair to assess the effect of the operation on the sphincter defect and to investigate unsatisfactory results after surgery^{2,3}. Other pathology such as iatrogenic anal sphincter injury following a lateral sphincterotomy, perianal sepsis and fistula can also be evaluated.

Endoanal ultrasound can also be used to assess the safety of new treatments, for example, to ensure that there is no migration of an artificial bowel sphincter.

MRI - MRI is equivalent to endoanal ultrasound for the assessment of external sphincter defects but not internal sphincter defects.

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Conservative Management

Paula Igualada-Martinez – UK

A lecture on the initial treatment of anal incontinence with conservative measures (for example, lifestyle and dietary modifications, medications, anal plugs, rectal irrigation).

The first line management of anal incontinence is conservative management. Conservative management strategies range from educating patients about normal defecation and possible alterations in anal incontinence, setting goals for therapy, making lifestyle modifications such as diet and weight loss, using medications, emptying the rectum with Transanal irrigation, and selecting/using containment (e.g., absorbent products, anal plug or insert)¹. Conservative management also includes electromyographic (EMG) biofeedback, neuromuscular electrical stimulation (NMES) and in particular, pelvic floor muscle training (PFMT). PFMT aims to increase strength/power (the maximum force produced by a muscle in a single contraction), endurance (ability to contract repetitively and to maintain the muscle contraction over a period of time) and synchronize muscle activity (such as the pre-contraction of pelvic floor muscles including the external anal sphincter previous to a rise in intraabdominal pressure, or to repress urge).²

Success of conservative management of anal incontinence depends in part on self-management by the patient, a plan recommended by an informed healthcare provider, and consideration of the patient's goals for treatment.³

This part of the workshop will review the most up-to-date literature regarding the conservative management of AI. This workshop also aims to familiarise delegates with the interventions used in this group of patients and provide guidance for evidence-based decision-making regarding conservative management of AI.

References

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Neuromodulation

Samantha Morris – UK

An explanation of the indications for neuromodulation, the evidence for its' use for anal incontinence and the steps needed to implement treatment.

Neuromodulation is a recommended treatment for urge anal incontinence following the failure of conservative treatment methods. There are a variety of neuromodulation systems on the market, ranging from the minimally invasive that can be performed in the outpatient clinic (e.g. Percutaneous Tibial Nerve Stimulation (PTNS)) to surgical treatment (e.g. Sacral Neuromodulation (SNM)). They are ineffective for other forms of anal incontinence, e.g. passive leakage, and thus patient selection is key.

PTNS is a simple and non-invasive treatment form of neuromodulation which can be performed in the outpatient setting. PTNS stimulates the tibial nerve, which contains L4-S3 fibres. It involves the insertion of a fine gauge needle electrode next to the posterior tibial nerve. This is connected to a surface electrode placed on the under-surface of the foot and to a stimulator. Stimulation is gradually applied, and the needle position altered, until the patient experiences a sensory and/or motor response. At this point, the stimulator is set to provide stimulation to the patient for a 30 minute period. The patient undergoes many of these 30-minute stimulations, and the number and time between each varies between centres, making studies hard to compare. "Top-Up" stimulations can also be administered after initial treatment to help maintain symptom improvement, but again the protocol of administration of these "Top Ups" varies widely. Effectiveness of PTNS for treatment of anal incontinence is debated. Numerous single-centre reviews suggest a significant improvement in reduction in anal incontinence episodes. The CONFIDeNT trial – a double-blinded randomised control trial comparing PTNS with sham stimulation (Knowles et al 2015) showed no significant benefit of PTNS over sham, with further analysis suggesting that additional obstructive defaecation symptoms negatively affected the outcome (Knowles et al 2017). Conversely, a second randomised trial (Baeten et al 2017) did show an improvement in anal incontinence symptoms above sham stimulation. Despite the conflicting data, PTNS may be a suitable treatment option for a particular subset of patients who have failed conservative treatment and are not suitable for surgical options.

SNM is recommended by the ICS as a treatment option for those with anal incontinence following the failure of conservative treatment options, and is the preferred treatment option if the patient has combined urinary symptoms (Siegel et al 2018). It involves the same two-stage surgical procedure used to treat urinary urge incontinence and voiding dysfunction, with either a pne or timed lead first stage, followed by second stage permanent implantation if significant symptom relief is seen. The lead is placed intraoperatively in the S3 foramen, and connected to an external (first stage) or internal (second stage) stimulator. Stimulation is set to a sub-threshold level. Numerous groups, including a double-blind crossover study (Leroi et al 2005) and a Cochrane Review (Thaha M.A. 2015) , have shown SNM to be successful and above placebo in reducing anal incontinence in a subset of patients. Success is deemed as a 50% reduction in urge anal incontinence episodes. There are now numerous systems available on the market, with options including implant rechargability and MRI compatibility.

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Surgical Management

Massarat Zutshi – UK

An outline of the main surgical options for anal incontinence and the evidence and indications for each (for example, artificial sphincter, sphincter repair).

Surgery is used selectively, particularly in those with defects of the anal sphincter which can be corrected mechanically. There is no one perfect surgical option and there have been different techniques which have been available over the years, only some have proven useful and many have been hampered by complications and adverse outcomes.

Sphincter repair: This is the mainstay surgical treatment for anal incontinence. Obstetric anal sphincter injuries may be repaired primarily (at the time of injury) or secondarily (after the event). For a secondary repair the free ends of the sphincter are mobilised and an overlapping repair is performed. Complications include wound infection and fistula.

Neoanal sphincters: May be biological or non-biological.

Artificial sphincter - An inflatable cuff is implanted around the anal canal and a pressure regulating balloon and pump which is placed in the scrotum or labia majora. Continence is controlled by inflating and deflating the cuff. Other devices which have been used include the Fenix device (not currently available) which is a ring of magnetic beads placed around the sphincter complex to reinforce the sphincter. Complications of an artificial sphincter include infection, mechanical failure and migration.

Muscle transfers - The gluteus maximus muscle or gracilis muscle may be used to create a neoanal sphincter. Although these muscle transfers are both still used the results are disappointing as patients are unable to sustain voluntary contraction of the skeletal muscle. The development of an electrically stimulated anal neosphincter involves the use of a pulse generator and stimulating electrodes to convert fast twitch fatigable muscle to slow twitch fatigue resistant muscle, which is continuously stimulated.

Sphincter bulking: Bulking agents are injected into the anal sphincter to provide extra strength. Complications include sepsis and migration.

Other surgical options include the surgical treatment of underlying rectal prolapse, a rectocele or haemorrhoids or the formation of a stoma.

Stoma:

MACE (Malone antegrade continence stoma for enema administration) – the formation of a non-refluxing, catheterisable appendico-caecostomy to irrigate the distal colon keeps the colon free of stool.

Colostomy - A last resort when other procedures have failed or not likely to be successful.

Take Home Messages

Anal incontinence is a common, debilitating condition which may present alongside other pelvic floor dysfunction.

Assessment comprises of clinical assessment, anorectal physiology and endoanal ultrasound. Assessment of the salient features can help to direct treatment and assess treatment outcomes.

The mainstay of treatment is conservative.

Suggested Learning before Workshop Attendance

Faecal Incontinence: Introduction. Falco Giuseppe

Pelvic floor disorders: Imaging and Multidisciplinary Approach to Management.

Editors: Santoro Giulio, Andrzej P Wiczorek, Clive Bartram

ICI Incontinence 6th edition book chapters 1, 16 and 17

Chapter 1 (Epidemiology of urinary incontinence (UI) and other lower urinary tract symptoms (LUTS), pelvic organ prolapse (POP) and anal incontinence (AI).

Chapter 16 (Assessment and conservative management of faecal incontinence and quality of life in adults)

Chapter 17 (Surgery for faecal incontinence)

Abrams,P, Cardozo, L, Wagg, A, Wein, A. (Eds) Incontinence 6th Edition (2017). ICI-ICS. International Continence Society, Bristol UK, ISBN: 978-0956960733.

<https://www.acpgbi.org.uk/patients/conditions/bowel-incontinence/>

<https://masic.org.uk/>

<https://www.nice.org.uk/Guidance/qs54>