



AN UPDATE ON CURRENT DIAGNOSTIC TOOLS IN ANORECTAL DISORDERS

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ABSTRACT:

Anorectal emergencies comprise a wide variety of diseases that share common and overlapping symptoms, i.e., anorectal pain or bleeding, some of the them could be life-threatening and might require proper diagnosis and immediate management. It is well known that an incorrect diagnosis/delayed diagnosis is frequent for anorectal diseases leading to an impaired outcome. This article aims to improve the knowledge and the awareness on diagnostic tools, useful for every physician dealing with Anorectal emergencies.

INTRODUCTION:

Ano-rectal disorders present with a variety of symptoms and result from either structural or functional dysfunction. Making the correct initial diagnosis is probably the main issue in these cases, because the acute pain could preclude a complete and accurate clinical examination and the embarrassment related to the affected anatomical region delays the presentation of the patient in many cases. It is demonstrated that a delayed diagnosis is related to an adverse outcome ^[1]. Because symptoms alone are poor predictors of the underlying pathophysiology, a diagnosis should only be made after a detailed history, a thorough physical and digital rectal examination and a systematic evaluation are essential to correctly identify these conditions. Furthermore, anorectal disease remains a relevant healthcare problem that can consume a considerable amount of financial resource, both as direct costs related to medical treatments and as indirect expenses, such as loss of work days and impaired quality of life. In the light of the above, it becomes clear how important it is to spread knowledge in improving the diagnosis which helps in proper treatment. Every physician working in an acute care setting will face this set of pathologies. This article aims to improve the knowledge and the awareness on diagnostic tools which is useful for every physician dealing with anorectal emergencies.

I. Tests For Anorectal Motor Function ^[2]:

1. Anorectal Manometry ^[3]: A non invasive procedure, for studying the contribution of the anorectal sphincter to the physiologic process of defecation. It measures the pressures created by the muscles, the sensation in the rectum, and the neural reflexes necessary for normal bowel movements.

Advantages

In Diagnosis of

- Chronic constipation
- Faecal incontinence

Disadvantages

- In Patient with known anal stricture it cannot be performed
- Perforation (tearing) or bleeding of the rectum could occur.

2. Anal Endosonography ^[4]: A simple, minimally invasive technique that can be used to visualize the anal sphincters and in evaluating the Anorectum.

Advantages

In Diagnosis of

- Anal sphincter lesions and tears
- Perianal fistulas mapping
- Staging of Anal canal tumours (Morphological, Functional and Vascular pattern)
- 100% sensitivity in identifying sphincter defect
- Discontinuity of the sphincter indicates a tear, and scarring is characterized by loss of the normal texture that usually has low reflectiveness

- Accurate assessment of Rectal tumours before surgery, after Chemo/radiotherapy and after surgery

Disadvantages

- Poorly tolerated in patients with Faecal incontinence caused by anorectal fistulas
- Minor bleeding
- Very rarely perforation of the bowel wall

II. Test For Anorectal Neurophysiological Function :

1. Electromyography ^[5]: Measures amplitude as well as duration of muscular action potentials during rest, voluntary anal contraction and attempted defecation

Advantages

In Diagnosis of

- Faecal incontinence
- Lumbosacral neuropathy causing FI
- Identifying sphincter injury
- Confirms the proper muscle contractions during squeezing and muscle relaxation during pushing

Disadvantages

- Needle electrode EMG use is limited by the anal pain induced during examination.
- The surface electrode and cone-shaped plug techniques can provide a global anal assessment rather than assessment of each EAS quadrant

III. Tests For Anal Structure:

1. Transperineal Ultrasonography ^[6] : A safe and painless technique that dynamically and non-invasively evaluate anorectal structure

Advantages

In diagnosis of

- Obstructed defecation, inflammatory perianal diseases and Faecal incontinence
- Evacuatory disorders and pelvic floor dysfunction.
- Diagnosing, Classifying perianal fistulas and abscesses.
- 90% to 95% sensitivity for the identification of the internal orifice
- Detailed information on the length and level of stenosis and upon the integrity of the anal sphincters.
- Assessment of Internal haemorrhoid
- In Ulcerative colitis, to assess the wall of the distal rectum and anorectal junction

Disadvantages

- Poor penetration below 5-6 cm, not allowing for a good evaluation of the structures that are away from the probe (extrasphincteric and suprasphincteric tracts),
- Difficulty in evaluation of some superficial lesions, when gas is present in the lesions or anal folds.
- Difficulty in differentiating active from inactive fistulas and active fistulas from collections.

2. Endoanal Or Pelvic MRI ^[7]: Evaluation of the anal canal and the adjacent structures as it provides a multiplanar assessment with high spatial resolution, high soft-tissue resolution and offers a complete overview of anal and perianal structures.

Advantages

- Highly accurate in identifying the fistulous tract, its course, branches, and associated inflammatory collections
- Accurately demonstrate the relationship of fistulous tract with the external and internal anal sphincter and can thus, accurately classify the type of fistula.
- Noninvasively offers important information that can reduce surgical complications and post operative recurrence of the disease.
- Provides an excellent preoperative understanding of the disease, enabling selection of the most appropriate surgical treatment and, therefore, minimizing all chances of recurrence. It should be considered as the investigation of choice for evaluation of perianal fistulas.
- No radiation exposure.
- Both functional and anatomical assessment can be carried out at once if required.
- Better patient compliance as compared to conventional fistulography and endoanal USG

Disadvantages

- Takes a longer time
- Costly
- Lesser availability
- Some patients may experience claustrophobia and may not be able to co-operate in the study.

3. MR Fistulogram^[8]: An imaging technique to create an image of the sphincter muscles, the anal canal, and its surrounding soft tissues

Advantage

- Multiplanar imaging and a high degree of soft tissue differentiation
- Ability to demonstrate hidden areas of sepsis and secondary extensions
- 3 dimensional image –
Axial view– Position of fistula – spreading of fistula
Sagittal view – Identifying transplentric fistula
Structures adjacent to anal canal can be seen
Coronal view – tracks can be seen clearly

Disadvantage

- Expensive
- Long periods of necessary immobility make some patients feel uncomfortable and claustrophobic

4. Colonoscopy^[9]: Endoscopic examination of large intestine and rectum

Advantage

- High sensitivity and specificity
- Allows visualisation of entire colon
- Possible removal of polyps
- Lesions above lower 1/3rd rectum visualised
- In diagnosis of -Recurrent fistula

Fistula with E O

Non-cryptoglandular fistula

- Biopsy can be taken
- In differentiating: IBD/ CA rectum

Disadvantage :

- Painful
- Needs preparation
- Expensive
- Cannot be done in OPD

5. CT Contrast Colonography ^[10]: The technique in which the data of a helical or multi-slice CT examination are used to generate a volumetric display of the entire colon.

Advantage

- Non –interventional
- Non-painful
- No preparation needed
- To examine large intestine for cancer /polyps, any colonic changes of Crohn's disease

Disadvantage :

- Biopsy cannot be taken during procedure

IV. Tests For Ano Rectal Sensory Function

1. Balloon Distension: Measures the strength of the anal sphincter muscles, sensations of stool in the rectum, reflexes that govern the bowel, and movements of the rectal and anal muscles

2. Rectal Barostat ^[11]: Evaluation of both motor and sensory function is performed with a computerized barostat that enables distension at a specified and precise rate, thereby minimizing observer bias and measurement error.

Advantages

- In evaluation of Evacuation disorders, Dyssynergic defeacation
- Rectal hypersensitivity is a common finding in patients with symptoms of urgency and frequent defecation IBS, ulcerative colitis and radiation proctitis

- Faecal urgency, urge Faecal incontinence and low anterior resection syndrome

- simple-to-perform, office-based

Disadvantages

- It cannot define the structural abnormality of anorectum and mechanisms of disordered defecation
- Demographic factors have an influence, with male participants having a shorter balloon expulsion time than women
- Expulsion time increases with age, can be, affected by rate and pattern of distention, patient position, and biomechanical properties of the rectum

V. Tests For Rectum Motor Function

1. Distal Colonic Manometry ^[12]: Records the dynamic colonic contractions of different colorectal segments in real time ,in evaluating colonic motility

Advantages

- To assess whether chronic intestinal obstruction is caused by the dysfunction of the colon or by extra-intestinal factors
- To distinguish constipation due to intrinsic neuromuscular disorders from that caused by behavioural factors in children (complex bio psychosocial disorders)

Disadvantages

- High cost of sensors, the fragility of the catheters
- Fails to identify colon contraction events in constipated patients with delayed transit.

- Cannot be used to distinguish patients with slow-transit constipation or with evacuation disorders from those with normal-transit constipation

VI. Tests For Anorectal Motor Sensory And Structure Functions :

1. Magnetic Resonance Defecography ^[13] : It produces detailed images during a bowel movement and provides information about the structure and function of the rectum and the pelvic floor, a network of muscles that stretches between the pubic bone and spine and the abdominal organs it supports.

Advantages

- Insight into rectal function.
- In diagnosing – F.I, Constipation.
- To evaluate diseases affecting rectal function and Pelvic floor dysfunction, such as hernia, pelvic organ prolapse or rectal prolapse
- Provide information for surgical and treatment planning.

Disadvantages

- High-quality images depend on your ability to remain perfectly still and follow breath-holding instructions while the images are being recorded
- A person who is very large may not fit into certain types of MRI machines. There are weight limits on the scanners.
- Implants and other metallic objects can make it difficult to obtain clear images.
- A very irregular heartbeat may affect the quality of images.

2. Functional Lumen Imaging Probe ^[14] (FLIP) :

For assessment of lumen size and sphincter distensibility in GIT

Advantages

- Provide detailed visualization of the anal canal geometry and these measurements can provide invaluable input to predict the surgical outcomes.
- Ability to provide information about the distensibility of sphincter besides displaying the real-time images.

Disadvantages

- Unable to detect variations along the circumference, because it estimates the anal canal as a circular cylinder. This will probably restrict the usefulness of FLIP in patients with lesions localized to part of the circumference including patients with traumatic or obstetric sphincter lesions
- The spacing of the electrode pairs (5 mm) limits the spatial resolution of the FLIP. The rectoanal inhibitory reflex mediates relaxation of the IAS (Internal Anal Sphincter) during rectal distension. This could be a potential source of error with FLIP as part of the bag is within the rectum.

VII. Stool Examination :

1.Faecal Calprotein ^[15] 2.Faecal Lipocalin

3.Faecal Lactoferrin - A biochemical measurement of the protein in the stool, indicates the migration of neutrophils to the intestinal mucosa, which occurs during intestinal inflammation

Advantages

- To diagnose IBS
- Relatively good acceptance
- Non-invasive
- Relatively low cost
- May be combined to improve prediction
- Can be repeated as a longitudinal monitoring tool
- Response to anti-TNF therapy
- May eliminate the need for invasive colonoscopy or radio-labelled white cell scanning.

Disadvantages

- Not always well accepted by patients (Faecal samples)
- Subject to non-specific variations
- Predictive threshold values not fully established
- Imperfect correlation with mucosal healing and transmural healing
- False positive in any colitis like amoebic colitis
- Not diagnostic but indicative

VIII. Serology ^[16]:

- 1. Peri-Nuclear Anti-Nuclear Antibodies-**
Serologic marker associated with Ulcerative colitis
- 2. Anti- Saccharomyces Cerevisae Antibody-**
Serologic marker associated with Crohns disease.
- 3. Anti-Flagellin Antibody -** Serologic marker associated with Crohn's disease.

For specific diagnosis -When patient is in sub clinical condition (No symptom of crohn's but

Patient has complicated fistula , perforations or other serious problems is positive)

Advantages

- In distinguishing between ulcerative colitis and Crohn's disease in patients for whom the specific diagnosis is unclear based on endoscopic, pathologic, and imaging evaluations
- If ASCA is positive and pANCA is negative, then it is likely that the person has Crohns Disease.

If ASCA is negative and pANCA is positive,

then it is likely that the person has Ulcerative colitis.

Disadvantages

- Not useful for determining the extent of disease
- Not useful in determining the response to disease-specific therapy
- Non specific
- Not diagnostic but indicative
- False positive in any colitis like amoebic colitis
- Expensive

IX. Other Technologies

- 1. Scintigraphic Assessment of Ano Rectal Angle ^[17]:** A simple, safe, low-radiation, real-time method of imaging the anorectum to know the ano rectal angle during resting, squeezing and evacuation.

Advantages

- Anorectal angle and pelvic floor movement can be examined

- The radiation dose to pelvic organs is significantly less than with video-proctography
- To diagnose- Faecal incontinence
 - Rectal prolapse
 - Long standing constipation
 - Rectocele
- Videoproctography is semiquantitative and the high radiation exposure precludes prolonged or repeated testing

Disadvantages

- Exposure to ionizing radiation in comparison with MR defecography
- Variability among radiologists in interpreting studies, inhibition of normal rectal emptying because of patient embarrassment

2. Leukocyte Scintigraphy ^[18]: Labelled leukocyte is used for the detection of inflammation and sepsis in which there is heavy granulocyte accumulation.

Advantages

- In diagnosis of Crohns and ulcerative colitis

Disadvantages

- May give false positive results , For ex: The test becomes positive in regular colitis also

CONCLUSION :

Ano-rectal disorders(ADs) represent a significant socio-economic burden. Symptoms alone do not provide sufficient information on the underlying pathology, therefore in cases where symptoms are refractory to treatment Ano-rectal testing is indicated. The continence mechanism is complex and requires a complex interaction of involuntary and voluntary muscle

activity, motor and sensory motor pathways, as well as a functioning rectal reservoir. The armamentarium of diagnostic tools in ADs has grown over recent years and have improved our understanding of anorectal structure and function. However, no single test can diagnose FI and Evacuatory disorder on its own and current guidelines recommend a series of tests to assess anorectal structure as well as sensory and motor function. Together with a detailed history, a thorough physical and DRE and appropriate testing, in most patients the underlying cause and type of anorectal disorder can be correctly identified and treatment can be tailored.

Significant advances in basic science studies and development of newer diagnostic techniques in humans have advanced our understanding of the multifaceted dysfunctions that contribute to pelvic floor disorders.

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