Incontinence

Recognition & Relief
FUNCTIONAL ANATOMY
The rectum: • is a hollow muscular tube, 12 to 15 cm long, composed of a continuous layer of longitudinal smooth muscle that interlaces with the underlying circular smooth muscle. The anal canal • The length of the anal canal is about 4 cm (range, 3-5 cm), with two thirds of this being above the pectinate line (the dentate line) and one third below it.
The anal sphincter complex • The IAS is a thickened expansion of the circular smooth muscle of the bowel wall, a predominantly slow-twitch, fatigue-resistant muscle that contributes approximately 70% to 75% of the resting sphincter pressure but only 40% after sudden rectal distension and 65% during constant rectal distension. • The anus is therefore normally closed by the tonic activity of the IAS that is primarily responsible for maintaining anal continence at rest.
Reinforcement during voluntary squeeze by the EAS (voluntary sphincter) can contribute an additional 25% of anal squeeze pressure. Because the EAS is made up of fast-twitch, fatigable fibers, this increased tone cannot be maintained over a prolonged period.
6. • The rectum contains three distinctive semilunar mucosal folds, which help to maintain its capacitance. • The rectum can accommodate up to 300 mL without any significant increase in intraluminal pressure. • Beyond 300 mL of volume, the intraluminal pressure increases, followed by a feeling of urgency.
7. • The anal mucosal folds, together with the expansive anal vascular cushions, provide a tight seal. • These barriers are further augmented by the puborectalis muscle, which when tonically contracted forms a flap-like valve that creates a forward pull and reinforces the anorectal angle.
PHYSIOLOGY OF DEFECATION
The successful storage and evacuation of fecal material relies on: 1. normal stool consistency and volume 2. bowel motility 3. rectal compliance 4. intact anal sphincter complex 5. the ability to voluntarily relax the puborectalis muscle and EAS to facilitate defecation. 6. Intact mental function
The physiology of voluntary bowel evacuation relies on the rectoanal inhibitory reflex (RAIR). • When a bolus of fecal material is delivered to the rectum, increased rectal pressure and distension causes transient relaxation of the IAS, allowing a small sample of the rectal contents to come in contact with the sensory afferent somatic nerves innervating the anoderm.
The amplitude and duration of this relaxation increases with the volume of rectal distension and is mediated by the myenteric plexus. • The RAIR facilitates the discrimination of gas, liquid, or solid fecal material that is present in the rectum and permits voluntary evacuation in a socially acceptable manner. • Once the conscious decision has been made to permit evacuation, the puborectalis muscle relaxes, increasing the anorectal angle and allowing passage of solid fecal material.
Fecal Incontinence
Fecal incontinence is defined as the inability to defer the elimination of liquid or solid stool until there is a socially acceptable time and place to do so. • Anal incontinence includes the inability to defer the elimination of gas, which may be equally socially embarrassing. • Minor incontinence is the inadvertent escape of flatus or partial soiling of undergarments with liquid stool. • Major incontinence is the involuntary excretion of feces.
Prevalence of FI in elderly After age of 65: • 15% in community dwelling women • 45% in nursing home residents Many patients are embarrassed and do not report their problem to their physician
Aging has been consistently identified as a major risk factor for the development of fecal incontinence: 1. Decreased strength of EAS, Week anal squeeze 2. Decreased resting tone in IAS 3. altered rectal compliance 4. Decreased anal sensation
Risk factors • Significant independent risk factors included: • age, depression, dementia, neurological diseases, immobility • constipation • Female sex, vaginal parity, and a history of operative vaginal delivery. • women with pelvic floor dysfunction (urinary incontinence and/or pelvic organ prolapse).
Embarrassment. • voluntary isolation • Depression • Poor QOL • Caregiver stress • Economic burden • Nursing home placement • Pressure ulcer
ETIOLOGY OF FECAL INCONTINENCE
1. Structural abnormality
2. Change fecal volume and consistency
3. Altered mental control
4. Neurological diseases
5. Pelvic Floor Dyssynergia (Anismus)
6. Idiopathic
Structural abnormality • Patients with abnormal anorectal complex: • sphincter trauma • rectal prolapse • rectal mass • Strictures • perianal fistula
Change fecal volume and consistency • Patients with constipation or fecal overload (e.g., diet, drugs) • Patients with loose stools or diarrhea from any cause (inflammatory bowel disease (IBD), irritable bowel syndrome (IBS), or radiation proctitis)
Altered mental control • Patients affected by cognitive issues (such as dementia, learning disabilities)
Neurological diseases • due to: 1. Impaired rectal sensation 2. decreased motor function of the sphincter complex. • Patients with neurological disorders (e.g., multiple sclerosis, spinal cord injury, stroke, DM related neuropathy etc.), • extensive straining at stool from constipation leading to stretching of the pudendal nerves over the ischial spines as the perineum descends.
Pelvic Floor Dyssynergia (Anismus) • Pelvic floor dyssynergia: • increase in rectal pressure during attempted evacuation in conjunction with impaired rectal emptying. • women with no identified pelvic floor or colonic abnormalities, have to resort to the use of enemas or digital disimpaction to achieve relief.
Idiopathic conditions: It is usually caused by denervation injury to the pelvic floor,
MANAGEMENT
Clinical assessment • stool diary and clinical features. • The history should initially focus on determining: • whether fecal incontinence is truly present, and its severity. • True incontinence must be differentiated from frequency and urgency without loss of bowel contents, which can occur in the setting of inflammatory disease, irritable bowel syndrome, and pelvic irradiation.
Determining the onset, duration, frequency, and severity of symptoms, precipitating events, and obtaining history of prior vaginal delivery, anorectal surgery, pelvic irradiation, diabetes, neurologic disease, and whether symptoms occur in a background of diarrhea or constipation. • perineal pain, hematochezia or purulent drainage (tumors, inflammatory bowel disease, radiation proctitis, or benign anorectal conditions such as hemorrhoids or fistula-causing disease) can elucidate other diagnoses.
Physical examination • Should include a detailed physical and neurological examination of the back and lower limbs to evaluate for a systemic or neurological disorder. • Digital rectal examination can identify patients with fecal impaction and overflow but is not accurate enough for diagnosing sphincter dysfunction or initiating therapy.
Examine the external anoderm • Test for an anal wink bilaterally • Inspect for prolapsing hemorrhoids or other obvious pathology • Perform a digital examination while asking the patient to bear down and to squeeze Having the patient perform a Valsalva maneuver while observing the perineum and perianal area may show evidence of inappropriate perineal descent, rectocele, cystocele, or rectal or vaginal prolapse.
1. Endoscopic evaluation of the rectosigmoid region is appropriate for detecting mucosal disease or neoplasia that may contribute to fecal incontinence.
2. Anorectal manometry with rectal sensory testing is the preferred method for defining the functional weakness of the external or internal anal sphincter and for detecting abnormal rectal sensation. Measurement of rectal compliance (reservoir function) may be helpful in some patients.
3. Anal endosonography is the simplest, most widely available and least expensive test for defining structural defects in the anal sphincter and should be considered in patients with suspected fecal incontinence.
4. Defecography is useful in patients with suspected rectal prolapse or those with poor rectal evacuation but is otherwise of limited value.
5. Balloon expulsion test can identify impaired evacuation in patients with fecal seepage or in those with fecal impaction and overflow.
6. Pudendal nerve terminal latency: May be useful in the assessment of patients prior to anal sphincter repair and is particularly helpful in predicting the outcome of surgery.
Anorectal manometry with rectal sensory testing
• It is most useful when it reveals an abnormally low sphincter pressure demonstrating that a sphincter defect is present. • Decreased resting pressure suggests isolated IAS sphincter dysfunction, while decreased squeeze pressure suggests isolated EAS dysfunction. • The anorectal inhibitory reflex can be demonstrated by measuring the amount of distension required to induce relaxation of the IAS (typically 20 mL).
Rectal sensation can be assessed by inflating a rectal balloon to detect the threshold (smallest volume of rectal distension) for three common sensations: • the first detectable sensation (rectal sensory threshold), • the sensation of urgency to defecate, • and the sensation of pain (maximum tolerable volume). • However, the clinical significance of the last two thresholds is less well-established than the first since the rectal sensory threshold is valuable for determining whether biofeedback will be helpful. Biofeedback is unlikely to be helpful in patients in whom the rectal sensory threshold is poor.
Pudendal nerve terminal latency • is determined by measuring the time required after stimulating the pudendal nerves with an electrode as it crosses the ischial spine to induce a contraction of the EAS. • Normal delay is 2.0 msec; • prolongation of the PNTL suggests damage to the nerve.
Endorectal ultrasound and magnetic resonance imaging • Structural abnormalities of the anal sphincters, the rectal wall, and the puborectalis muscle
Defecography • Defecography is performed by instilling a barium paste into the rectum • the patient seated on a radiolucent commode. • films are taken of the anorectal anatomy at rest and during straining and defecation. • Defecography can measure the anorectal angle, evaluate pelvic descent, and detect occult or overt rectal prolapse.
Electromyography • Electromyography (EMG) activity of the anal sphincter is helpful in evaluating neurogenic or myopathic damage • endorectal ultrasound may have rendered the EMG obsolete in sphincter mapping because of the discomfort associated with EMG.
TREATMENT
Diet and lifestyle
1. Dietary modification is the initial step in the treatment of incontinence. – Intake of caffeine and alcohol should be avoided. – identify foods that cause fecal incontinence, eg, foodstuffs containing high concentrations of lactose, fructose, or sorbitol. Elimination of these substances from the diet may resolve the problem. – A high-fiber diet and bulking agents should be tried (The recommended daily allowance for fiber is 25 g) – Try to drink 2 to 3 liters of fluid a day
2. Control fecal impaction • For the frail elderly and cases with neurologic disorders, fecal impaction is often the cause for overflow diarrhea and incontinence. In this subset of patients, osmotic laxatives and bowel retraining is effective treatment for incontinence in approximately 60%. • control soiling from fecal incontinence using diapers
Bowel training
1. Keeping to a regular pattern is very important for a bowel retraining program to succeed.
2. Set a regular time for daily bowel movements. Choose a time that is convenient for you.
3. Keep in mind the daily schedule.
4. The best time for a bowel movement is 20 to 40 minutes after a meal, because feeding stimulates bowel activity.
5. Privacy can help
6. Use digital stimulation to trigger a bowel movement:(You can also stimulate bowel movements by using a suppository (glycerin or bisacodyl) or a microenema).
After the stimulation, patient sit in a normal position for a bowel movement. (on the toilet or bedside commode). If confined to the bed, use a bedpan. Get into as close to a sitting position as possible. If unable to sit, lie on her left side. • If no bowel movement within 20 minutes, repeat the process. • Instruct her to contract the muscles of the abdomen and bear down while releasing the stool. bend forward while bearing down. This increases the abdominal pressure and helps empty the bowel. • Perform digital stimulation every day until the patient start to have a regular
3. Anal sphincter and pelvic floor exercises • Anal sphincter exercises and pelvic floor muscle training consists of repetitive contractions of the sphincter and perineal muscles,
BIOFEEDBACK • A rectal plug is used to detect the strength of the rectal muscles. A monitoring electrode is placed on the abdomen. • The rectal plug is then attached to a computer monitor. • A graph displaying rectal muscle contractions and abdominal contractions will show up on the screen. • Patient will be taught how to squeeze the rectal muscle around the rectal plug. The computer display guides her to do it correctly. The symptoms should begin to improve after three sessions. • Used when sphincters are structurally intact but week.
There are three general mechanisms by which biofeedback may improve fecal incontinence: • Improved contraction of the striated muscles of the pelvic floor • Enhancement of the ability to perceive rectal distension • Improved coordination of the sensory and strength components that are required for continence
Sacral nerve stimulation • Sacral nerve stimulation has been used to treat patients with incontinence who have an intact anal sphincter. • Electrical stimulation increases squeeze pressure of the external sphincter. • Two reports of the long-term results of sacral nerve stimulation suggest that there is a clear improvement in the symptoms in patients with fecal incontinence
Anal continence plug • is a polyurethane sponge wrapped in a water soluble coat. The size of the plug outside the body is 15 mm by 30 mm. • After placement in the rectum, the water-soluble coat dissolves and the plug expands to 30 mm by 38 mm. • The number of episodes of stool leakage and fecal incontinence was reduced substantially when the plug was worn, and patients felt more secure. • The plug was inserted for an average of 12 hours per day, and continence was achieved 82% of the time.
Pharmacologic treatment • goal of drug therapy is to reduce the fecal volume: 1. increased intestinal water and ion absorption 2. slowed motility.
Loperamide • an opiate agonist. • In addition to increasing absorption and slowing motility, loperamide increases internal anal sphincter pressure and diminishes the drop in sphincter pressure associated with rectal distention • 2 mg four times a day is the usual starting dose.
Ion exchange resins • Ion exchange resins such as cholestyramine and colestipol may be very effective in decreasing diarrhea and incontinence. • Cholestyramine, 2 to 4 gm twice daily adjusted to bowel habits. Colestipol, 1 to 2 gm twice daily adjusted to bowel habits.
Anticholinergic agents (such as hyoscyamine) taken before meals may be helpful in patients who tend to have leakage of stools after eating. • Low doses of the tricyclic antidepressant amitriptyline for idiopathic fecal incontinence. • Increase in colonic transit time. • Phenylephrine gel, a selective alpha 1 adrenergic agonist, increases internal anal sphincter tone
Stool consistency can be improved by supplementing the diet with a bulking agent (such as methylcellulose 1 to 2 tablespoons per day). This is particularly helpful in patients who have low-volume, loose stools, but may exacerbate incontinence in patients with decreased rectal compliance (such as those with radiation proctitis or a rectal stricture).
Surgical treatment
1. Sphincteroplasty (Sphincteroplasty is the preferred treatment of an isolated tear in the external sphincter. The most common cause of reparable injury is obstetrical trauma.)
2. Muscle transposition (gracilius or gluteus muscle transposition)
3. Artificial sphincter (for neurologic or muscular dysfunction of the sphincter) An inflatable cuff is placed around the anal canal. A pressure-regulating balloon is placed in the abdominal cavity, with the pump control mechanism placed subcutaneously. Pressure on the control mechanism will decompress the cuff, allowing for defecation. The cuff re-inflates spontaneously after several minutes.
4. Diversion colostomy (Diversion colostomy is indicated after failure of all other therapies).
Sphincter bulking therapies • Injectable materials to augment the function of the internal anal sphincter. • Collagen injection • Silicone biomaterial • Carbon-coated microbeads • Dextranomer-hyaluronic acid (Solesta) • Stem cells (under trial)