

**Complete/Total Prolapse**

- Full thickness prolapse is also called procidentia.
- It is defined as protrusion of the rectum for more than 3.75 cm outside the anal verge. Very often, it is the entire rectum which protrudes out on straining, sometimes along with the peritoneal sac.
- Often, it is associated with prolapse uterus.

**The pelvic floor—surgical anatomy (Fig. 31.41)**

- It is composed of the *twolevator ani and a puborectal muscle.*
- Levator ani originate from pelvic side walls and sacrospinous ligament, it *suspends* the rectum in a muscular sling which ends when puborectalis *angulates rectum.*
- Puborectalis muscle takes origin from posterior aspect of pubis, forms a sling around rectum and return to posterior pubis.
- *Contracted puborectalis is responsible for normal acute anorectal angle and it is critical for maintaining continence. Thus during coughing, sneezing, anorectal angle becomes more acute, increasing continence.*

**Supports of the rectum and surgical importance**

Various supports of the rectum keeps the rectum in position. Failure of one or more of these factors may precipitate prolapse (Fig. 31.42). They have been enumerated in the following lines.

1. **Pelvic floor:** Weakness of pelvic floor can be due to birth injuries or due to defective collagen maturation.
2. **Lateral branches:** These ligaments are due to condensation of pelvic fascia on each side of the rectum. Excessive mobility of these ligaments may be the contributing factor for prolapse rectum.
3. ** bisternum or Denonvilliers (rectovesical fascia):** This is the deep rectovesical pouch is often found in prolapse rectum. In all cases of complete prolapse rectum, please look for this deep rectovesical pouch and if it is present it should be obliterated.

4. **Fat supports the rectum:** Hence, any chronic illness an loss of fat may contribute for prolapse rectum.

**Anorectal physiology and investigation**

These are useful in patients who have complaints of prolapse rectum, constipation, incontinence.

1. **Anorectal manometry**
   - Normal resting pressure in the anal canal—40–80 mm Hg (it is the function of internal anal sphincter.)
   - *Squeeze pressure:* It is maximum voluntary contraction pressure minus resting pressure. It is 40–80 mm Hg above resting pressure. It reflects function of external anal sphincter.
1. Old debalited

Hartmann's Sx

Lower end of rectum closed

Colostomy performed

5. OTHER TYPES

- TEM: Transanal Endoscopic Microsurgery
- Trans-sacral for Posterior Rectal Tumour
- Endoscopic Laser for Obstructive lesion
- Endoscopic stapling
- Endoscopic mucosal resection (≤2.5 cm diameter lesion)
Kegeal Prolapse

PAD / WAR

Perineal / Well's

Abdominal / Dorrone / Ripstein

Full Thickness Prolapse

Aetiology

Conservative

Control of diastasis recti

Worm infestation

Macewen

Rapeasea

Aetiology

High Risk

Vulva

Recurrent

A.D.

Constipation

Non Constipation

Rejection

Suture Reepovery

Mesh

WR
SOLITARY RECTAL ULCER SYNDROME

52. Ans. c. Usually malignant

53. Ans. a. SRUS (Ref: Sabiston 19/e p1372; Schwartz 9/e p1054; Bailey 25/e p1227; Schuckfled 7/e p1768-1769)

- SRUS is located on anterior or anterolateral rectal wall, 7-10 cm from anal verge
- May involve bowel anywhere from the sigmoid to the anorectal junction
- More common in women, age 20-40 years
- Multiple ulcers may be present within a single patch of diseased mucosa in 10-15% cases
- Endoscopically, only half of the patients with SRUS have an actual ulcer. The remaining patients have an area of mucosal erythema, mucosal nodules or frank polyps, which may or may not have surface ulcerations.

Etiology
- Internal intussusception
- Anterior rectal wall prolapse
- Increased intrarectal pressure

Histopathology
- Mucosal hyperplasia, crypt distortion or elongation
- Hypocellular lamina propria
- Subepithelial fibrosis, thickened muscularis mucosa
- Tongues of muscle extending to the mucosa

Clinical Features
- Patients are typically young and female, with an average age of 25 years and a history of straining and difficult evacuation.
- Commonly presents with rectal bleeding in the setting of straining or constipation, pain, mucus discharge.

Diagnosis
- Barium enema: Radiologic procedure of choice and usually reveals the underlying disorder.
- Full-thickness rectal prolapse, internal prolapse, paradoxical Puborectalis syndrome (failure of relaxation of the pelvic floor musculature on straining) and thickened rectal folds are common findings.

Treatment
- Non-operative therapy (high fiber diet, defecation training to avoid straining, laxatives or enema) is effective in majority of the patients.
- Surgery (either abdominal or perineal repair of prolapse) is reserved for highly symptomatic patients, who have failed all medical intervention.
- Rectopexy corrects anterior rectal wall prolapse.

54. Ans. b Anterior, 7-10 cm from anal verge
55. Ans. c Lamina propria infiltration with lymphocyte
56. Ans. c Involves posterior wall
57. Ans. c Banding, d. Sclerosant injection

RECTAL PROLAPSE

58. Ans. b. Anterior resection (Ref: Sabiston 19/e p1385-1387; Schwartz 9/e p1054; Bailey 26/e p1219-1221, 25/e p1222-1226; Schuckfled 7/e p1824-1832)

Abdominal rectopexy is the procedure of choice for complete rectal prolapse in young and fit patients.
Perineal procedures (Delorme’s procedure) are reserved for elderly and frail patients.
Abdominal rectopexy has the least recurrence rates and is most likely to improve continence.
Perineal procedures are reserved for elderly, frail and infirm patients, who are unlikely to tolerate major ‘abdominal’ procedures.
### Rectal Prolapse

- Mucous membrane and submucosa of the rectum protrude outside the anus for approximately 1-4 cm².
  - It may be mucosal or full thickness (whole wall of the rectum is included).
  - Commonly seen as a rectal intussusception.
- In children, the prolapse is usually mucosal and should be treated conservatively.
- In the adult, the prolapse is often full thickness and is frequently associated with incontinence.
- Surgery is necessary for full-thickness rectal prolapse.

### Clinical Features

<table>
<thead>
<tr>
<th>Children</th>
<th>Adults</th>
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<tbody>
<tr>
<td>• Mucosal prolapse often commences after an attack of diarrhea, or from loss of weight and consequent loss of fat in the ischiorectal fossa.</td>
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<tr>
<td>• It may also be associated with fibrocystic disease, neurological causes and maldevelopment of the pelvis.</td>
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<td>• Often associated with third-degree hemorrhoids.</td>
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<td>• In the male straining from urethral obstruction predisposes to mucosal prolapse.</td>
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<tr>
<td>• In old age, both mucosal and full-thickness prolapse are associated with atony of the sphincter mechanisms.</td>
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- Prolapsed mucous membrane is pink (prolapsed internal hemorrhoids are plum colored, trilobate and more pedunculated).

### Diagnosis

- Before operative intervention, a careful history, physical examination, and colonoscopy should be performed.
- Manometry should be done in cases associated with incontinence.

### Abdominal procedures

- Considered the surgical procedures of choice for young and fit individuals.
- Not suitable for elderly and infirm patients.
- Are most likely to improve continence.
- Have least recurrence rates.
- Postoperative constipation is the MC side effect.

#### Abdominal Procedures

- Suture Rectopexy
- Mesh Rectopexy
- Posterior (Wall’s iliac’s)
- Anterior (Ripstein’s)
- Lateral (Orr-Loygue)
- Ventral
- Resection Rectopexy (Frykman and Goldberg)
- Anterior resection

### Perineal procedures

- Relatively minor procedures that may be performed under local or regional anaesthesia.
- Well-tolerated by elderly, frail and unfit patients.
- Less likely to improve continence.
- Recurrence rates varying from 5-35% higher than following abdominal rectopexy.
- Postoperative constipation is infrequent.

#### Perineal Procedure

- Duhrssen’s mucosaectomy
- Thiersch and encirclement
- Ahmeier rectosigmoidectomy
- PAD

### Treatment of Rectal Prolapse in Childhood

- Prolapse during childhood is best managed conservatively, the only exception is persistence of prolapse despite effective treatment of diarrhea, worm infestation and malabsorption. These cases are managed by surgery.

<table>
<thead>
<tr>
<th>Conservative Treatment</th>
<th>Operative Treatment</th>
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<tbody>
<tr>
<td>Effective control of diarrhea, worm infestation and correction of malnutrition</td>
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<tr>
<td>Sclerotherapy:</td>
<td></td>
</tr>
<tr>
<td>• Thiersch operation</td>
<td></td>
</tr>
<tr>
<td>• Anal encirclement</td>
<td></td>
</tr>
<tr>
<td>• Ideally suited for prolapse in myelomeningocele and sacral agenesis</td>
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Complications
- Proctitis, ulceration and rarely bleeding
- Gangrene of the rectum (Fig. 31.48)

Treatment: Surgical procedures—aim
1. Safe procedure to correct with minimal morbidity and without mortality. They are classified as perineal procedures and abdominal procedures.
2. To cure or to improve incontinence

**PERINEAL PROCEDURES**

1. **Delemer’s procedure** (sealing the rectal mucosa): In this, the prolapse is completely evverted, mucosa is stripped and muscle coat is plicated. Mucosal continuity is maintained by suturing anal canal mucosa below to the rectal mucosa above. This is an easy operation to do in elderly patients. However, relapse rates are high and it does not correct the prolapse.

2. **Allmeier’s procedure**: In this operation, full thickness of the prolapsed rectum with part of sigmoid is excised, followed by anastomosis of part of the sigmoid to the anal canal from below. To improve continence, plication of levator ani and puborectalis muscle is done. Urgency and incontinence are the features because of removal of rectum.

3. **Thiersch wiring**: In this operation, a steel wire or a thick silk suture is applied all around the anus after reducing the prolapse. The knot is tightened around a finger. Patients with poor surgical compliance benefit from this operation.

However, breakdown of the wire, perianal sepsis and anal stenosis are the complications.

**II. ABDOMINAL PROCEDURES**

1. **Wells operation**: A laparotomy is done, rectum is pulled upwards and is sutured to the sacrum posteriorly with the help of a polyvinyl alcohol sponge kept behind the rectum. The sponge is sutured posteriorly and laterally to the wall of the rectum. Dense fibrotic reaction occurs resulting in fixation of the rectum to the sponge.

2. **Ripstein sling operation**: After a laparotomy, the rectosigmoid junction is sutured to the sacrum by using Teflon sling, below the sacral promontory. One complication of this operation is constipation due to rectosigmoid angulation. Hence, sigmoidectomy has been suggested along with this operation.

3. **Mesh rectopectomy**: Instead of polyvinyl sponge, a marlex mesh can be kept behind the rectum. This is sutured behind the sacrum and then to the posterior and lateral surfaces of rectum. **Laparoscopic method of fixing the mesh has become popular.** This is the procedure of choice today. Constipation is one of the complications of mesh rectopectomy. Hence, some resect sigmoid with this procedure (Goldberg operation) (Fig. 31.49).

4. **Lahan’s operation**: Anchoring rectosigmoid to rectus sheath (extraperitonealisation).

Key Box 31.12 shows summary of surgeries for prolapse rectum.

Fig. 31.49: Mesh fixation for total prolapse of the rectum—most common surgery—open or laparoscopic method
KEY BOX 31.12

SUMMARY OF SURGERIES FOR PROLAPSE RECTUM

- Mesh rectopexy corrects/prevents prolapse but does not correct chronic constipation.
- Laparoscopic mesh rectopexy has become gold standard—fast recovery, less pain, short hospital stay.
- Mesh rectopexy with resection is ideal for patients with constipation or patients with a redundant sigmoid colon.
- High operative risk patients—Thiersch wiring—anal encirclement.
- Alfkeemler procedure done for perineum is an alternative in patients with incontinence. Here, perineal proctectomy and posterior sphincter enhancement is done.

SURGICAL ANATOMY OF ANAL CANAL

It is 3 cm long, starts as the continuation of rectum, passes through pelvic diaphragm and ends at the anal verge (skin).

Internal sphincter (Fig. 31.50)
- It is the continuation of circular muscle fibres of rectum and ends 0.5 cm below pectinate line.
- It is involuntary and 2.5 cm long.
- Internal sphincter with fibres of external sphincter and puborectalis which maintain the anorectal angle, form the anorectal bundle, and maintains continence.
- Its fibres are transversely placed. Motor fibres come from presacral plexus.

External sphincter
- It is formed by striated muscle fibres intermingled with longitudinal muscle fibres of the rectum which get attached to the skin of perianal region.
- It has superficial, deep and cutaneous portions.
- Levator and puborectalis have an attachment with internal sphincter.

- Nerve supply (motor) comes from inferior hemorrhoidal nerve and perianal branch of internal pudendal nerve and perianal branch of 4th sacral nerve (motor to levator ani also).
- It is voluntary and gives temporary continence.

Development
- Anal canal is developed from fusion of post-anal with proctodeum.
- The junction of these is the dentate line or pectinate line.
- Anal valves of Ball are remnants of proctodeal membrane.
- At the level of dentate line, the mucosa is folded—form of longitudinal columns—columns of Morgagni.
- In between the columns of Morgagni, 4–8 anal glands into the small anal sinuses.

Comparison of anal canal above and below the dentate line is given in Table 31.3.

Table 31.3 Comparison of anal canal above and below the dentate line

<table>
<thead>
<tr>
<th>Nomenclature</th>
<th>Above the dentate line</th>
<th>Below the dentate line</th>
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</thead>
<tbody>
<tr>
<td>Nomenclature</td>
<td>Surgical anal canal</td>
<td>Anatomical anal canal</td>
</tr>
<tr>
<td>Epithelium</td>
<td>Cuboidal epithelium</td>
<td>Skin—squamous epithelium, without hair and sweat glands</td>
</tr>
<tr>
<td>Nerve supply</td>
<td>Parasympathetic. Hence, painless</td>
<td>Spinal nerves, inferior haemorrhoidal nerve, very painful</td>
</tr>
<tr>
<td>Venous drainage</td>
<td>Portal system</td>
<td>Systemic veins (external iliac vein)</td>
</tr>
<tr>
<td>Colour</td>
<td>Pink</td>
<td>Skin colour</td>
</tr>
<tr>
<td>Development</td>
<td>Post-allantoic gut</td>
<td>Proctodeum</td>
</tr>
<tr>
<td>Lymphatic drainage</td>
<td>Para-aortic nodes</td>
<td>Superficial and deep inguinal nodes</td>
</tr>
</tbody>
</table>
Anorectal Abscess

- Perianal Abscess
  - Injection of anal glands
    - T/L/E - Tender, Boggy, Swelling under anal mucosa

- Submucous Abscess
  - Drainage using proctoscope

- Ischio-rectal Abscess
  - Bounded above levator ani
  - Infection by pad of fat
  - Diabetic

- T/L/E
  - Incision
  - Drainage
  - Anaesthesia
  - Gradual Incision
  - Edges of skin trimmed for free drainage of pus.
61. Ans.a. Thiersch wiring
62. Ans. a. Rectal prolapse
63. Ans. c. Abdominal rectopexy
64. Ans. a. Abdominal rectopexy

ANO-RECTAL ABSCESS


- Acute sepsis in the region of the anus is common.
- More common in men
- Subdivided into: Perianal (MC)9, Ischiorectal (2nd MC)9, submucous and pelvirectal
- Underlying conditions: Fistula-in-ano (MC), Crohn’s disease, diabetes, immunosuppression9

**Cryptoglandular theory of Intersphincteric Anal Gland Infection**
- Upon infection of a gland, pus, which travels along the path of least resistance, may spread caudally to present as a perianal abscess or ischiorectal abscess9

**Clinical Features**
- Usually produces a painful, throbbing swelling in the anal region with swinging pyrexia
- Patients with infection in the larger fatty-filled ischiorectal space, in which tissue tension is much lower, usually present later, with less well localized symptoms but more constitutional upset and fever.
  - Increased incidence of infection in ischiorectal fossa is due to poor blood supply9

**Treatment**
- Drainage of pus + Antibiotics9
- Always look for a potential underlying problem9
- For perianal and ischiorectal sepsis (with an incidence of 60% and 30% respectively), drainage is through the perineal skin, usually through a cruciate incision over the most fluctuant point, with excision of the skin edges to de-roof the abscess.
FISTULA-IN-ANO

68. Ans. a. Intersphincteric (Ref: Sabiston 19/e p1394-1396; Schwartz 9/e p1064-1065; Bailey 26/e p1259-1263, 25/e p1262-1266; Shackelford 7/e p1787, 1914-1924)

- Fistula-in-ano is a chronic abnormal communication, runs outwards from the anorectal lumen to an external opening on the skin of the perineum or buttock.
- Usually results from anorectal abscess (cryptoglandular abscess?).
- Other causes: Crohn's disease, tuberculosis, lymphogranuloma venereum, actinomycosis, rectal duplication, foreign body and malignancy.
- Types: High or Low (according to whether internal opening is below or above the anorectal ring).

Clinical Presentation
- Non-specific anal fistulae are more common in men than women.
- Most commonly affect patients in 3rd-5th decade.
- Patients usually complain of intermittent purulent discharge and pain (which increases until temporary relief occurs when the pus discharges).
- There is a previous episode of acute anorectal sepsis that settled (incompletely) spontaneously or with antibiotics, or which was surgically drained.
- Passage of flatus or feces through the external opening is suggestive of a rectal rather than an anal internal opening.

Park's Classification of Fistula-in-ano (ITS-E)
- Intersphincteric fistulae (45%):
  - Runs in intersphincteric space
- Trans-sphincteric fistulae (40%):
  - Extends through both internal and external sphincters
- Suprasphincteric fistulae:
  - Originates in the intersphincteric plane and tracks up and around the entire external sphincter.
- Extrasphincteric fistulae:
  - Originates in the rectal wall and tracks lateral to both sphincters

Clinical Assessment
- A full medical history and proctosigmoidoscopy are necessary to gain information about sphincter strength and to exclude associated conditions.

Key Points to Determine
- Site of the internal opening
- Site of the external opening
- Course of the primary track
- Presence of secondary extensions
- Presence of other conditions complicating the fistula
- MRI is the ‘gold standard’ for fistula imaging
- Usually reserved for difficult recurrent cases.
- Advantage of MRI: Its ability to demonstrate secondary extensions, which may be missed at surgery and which are the cause of persistence.
- Fistulography and CT: Useful techniques if an extrasphincteric fistula is suspected.
Treatment
- Treatment options: Fistulotomy, fistulectomy, setons, advancement flaps and glues.
- Laying open is the surest method of eradication, but sphincter division may result in incontinence.

Type 1
(Inter-sphincteric)

Type 2
(Trans-sphincteric)

Type 3
(Supra-sphincteric)

Type 4
(Extra-sphincteric)

Goodall's rule
- Used to indicate the likely position of the internal opening according to the position of the external opening(s).

According to Goodall's rule:
- Fistulas with external openings anterior to horizontal imaginary line drawn across the mid-point of anus connect to the internal opening by short straight track.
- Fistulas with external openings posterior to horizontal line run a curvilinear course and open internally into posterior midline.

Exceptions of Goodall's rule:
- If an anterior external opening is >3 cm from the anal margin, such fistula track to the posterior midline.
- When there is an anterior and also a posterior opening of the same fistula, the rule of posterior opening applies.