

# Diverticular disease of GI system



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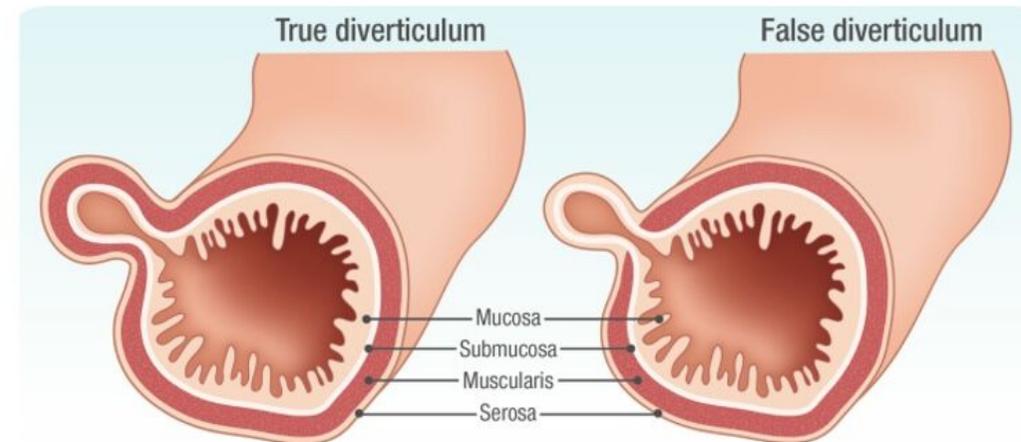
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**Diverticula (hollow out-pouchings) are a common structural abnormality.**

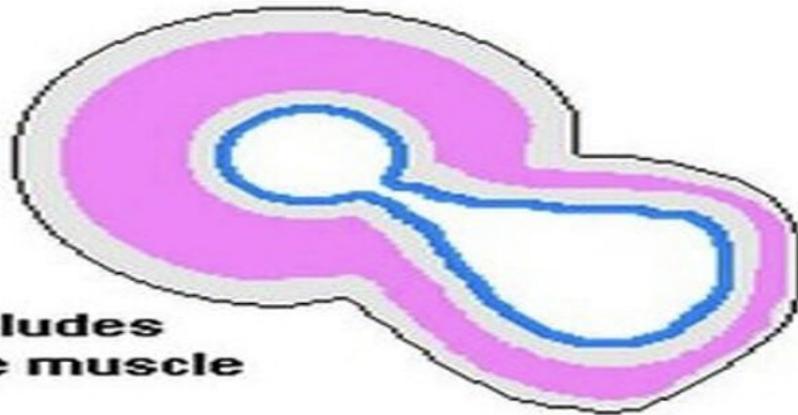
**They can be classified as:**

**1 Congenital. (True) All three coats of the bowel are present in the wall of the diverticulum (e.g. Meckel's diverticulum).**

**2 Acquired. (False) There is no muscularis layer present in the diverticulum (e.g. sigmoid diverticular disease, esophageal diverticulae)**



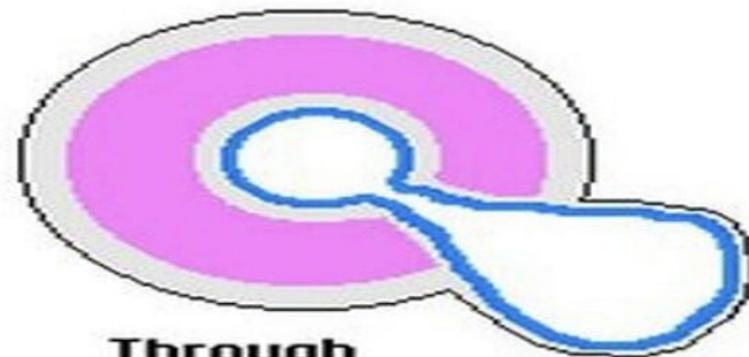
## True Diverticulum



**Includes  
the muscle**

Examples:  
Meckel's  
Normal appendix

## Pseudodiverticulum



**Through  
the muscle**

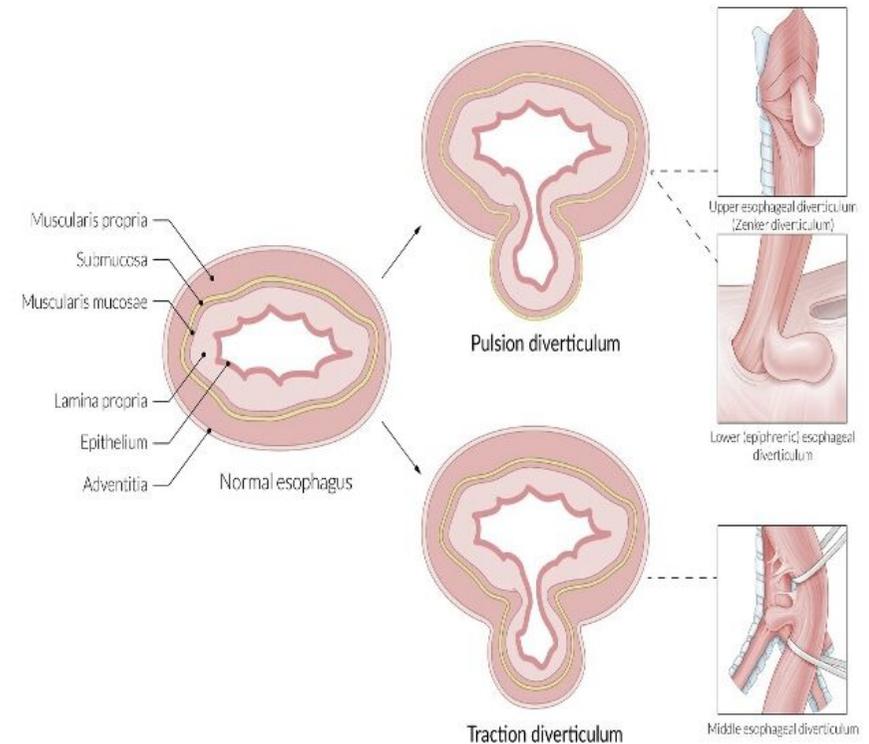
Examples:  
Zenker's esophageal  
Common colon "ticks"

## Layers of diverticulum

True :mucosa,submucosa, muscularis propria and serosa .

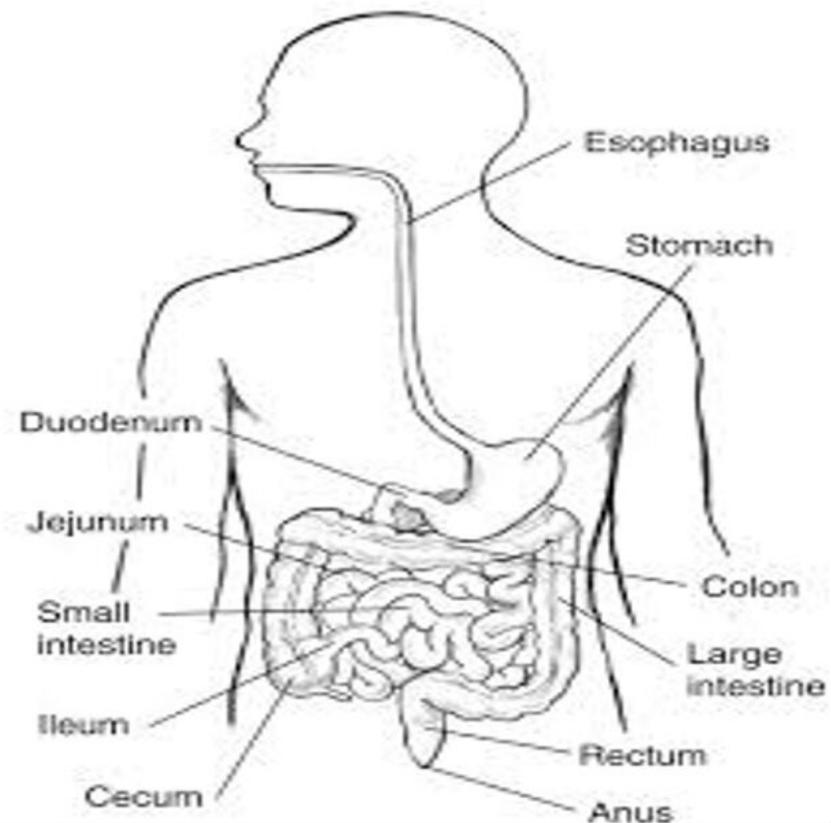
False:mucosa, submucosa ,and serosa like in rectosigmoid diverticulum or adventitia like in esophageal diverticulum .

- Acquired diverticulum have two types according to mechanism of its formation into
- **1-pulsion type:** rectosigmoid and zenker diverticulum
- Increase in intraluminal pressure lead to pulsion of mucosa and submucosa through muscularis propria
- **2-Traction type:** middle esophageal and acquired type of gastric diverticulum
- Traction forces from adjacent inflammatory process or fibrotic healing In adjacent Structure



**The diverticulum can involve :**

- 1. Esophagus**
- 2. Stomach**
- 3. Small bowel**
- 4. Cecum**
- 5. Large bowel**

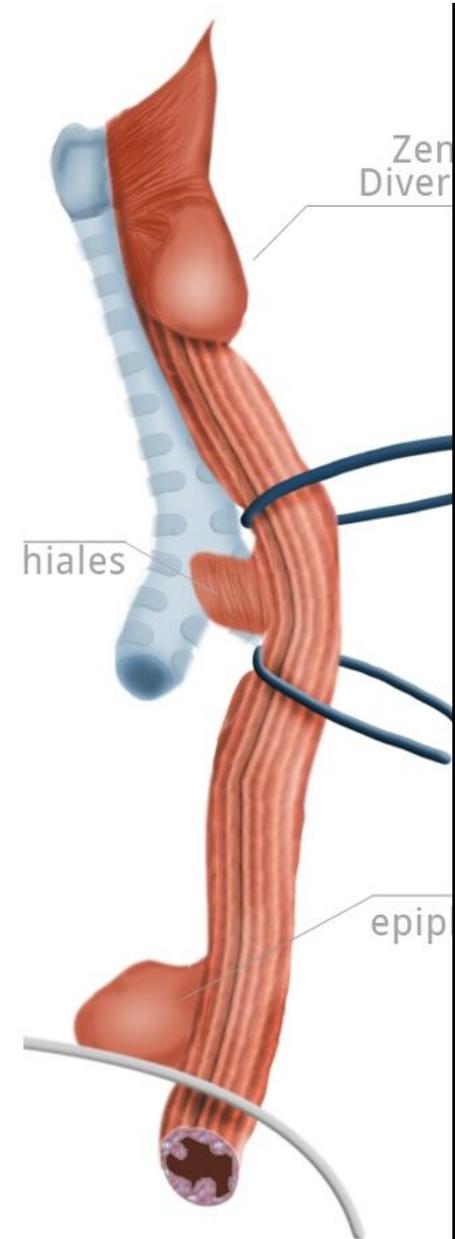


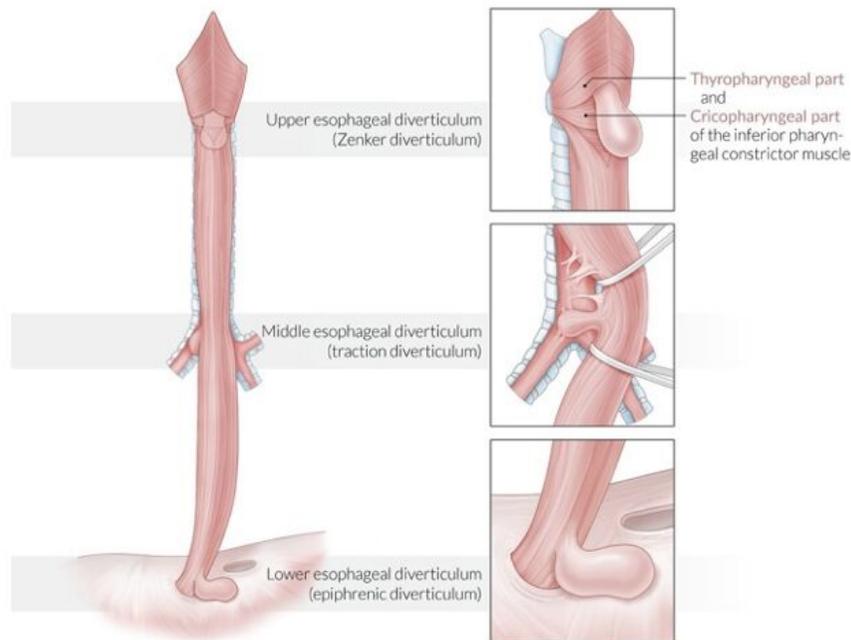
# 1. Pharyngeal and oesophageal diverticula:

it's a pouch or sac protruding from the esophageal wall.

## • Etiology

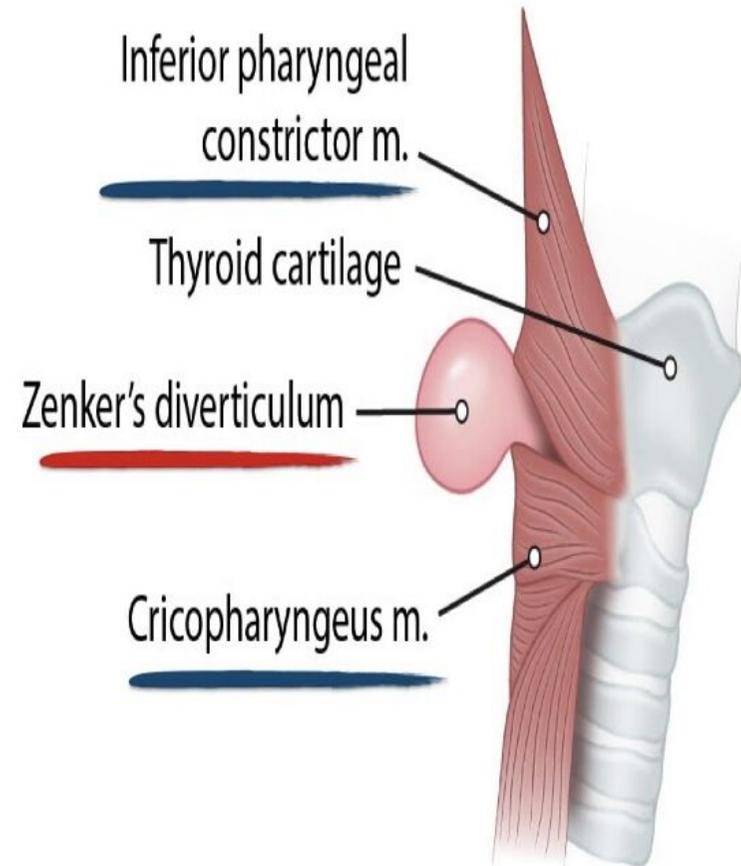
- Most oesophageal diverticula are pulsion diverticula that develop at a site of weakness as a result of chronic pressure against an obstruction.
- Traction diverticula are much less common :
  - . They are mostly a consequence of chronic granulomatous disease affecting the tracheobronchial lymph nodes due to tuberculosis, atypical mycobacteria or histoplasmosis.
  - Fibrotic healing of the lymph nodes exerts traction on the oesophageal wall and produces a focal outpouching which is usually small and has a conical shape.





- Types:
- **1. Zenker's Diverticulum:** Located above the upper esophageal sphincter.
- **2. midesophageal diverticular (Traction Diverticulum)** Typically found in the mid-esophagus due to inflammation or scarring and more common in TEF
- **3. Epiphrenic Diverticulum:** Found just above the lower esophageal sphincter.

- **Zenker's diverticulum:** (pharyngeal pouch) is not really an oesophageal diverticulum as it protrudes posteriorly above the cricopharyngeal sphincter through the natural weak point (the dehiscence of Killian) between the oblique and horizontal (cricopharyngeus) fibres of the inferior pharyngeal constrictor.





**Figure 62.63** The typical appearances of: (a) a small pharyngeal pouch with a prominent cricopharyngeal impression and 'streaming' of barium, indicating partial obstruction; and (b) a large pouch extending behind the oesophagus towards the thoracic inlet.

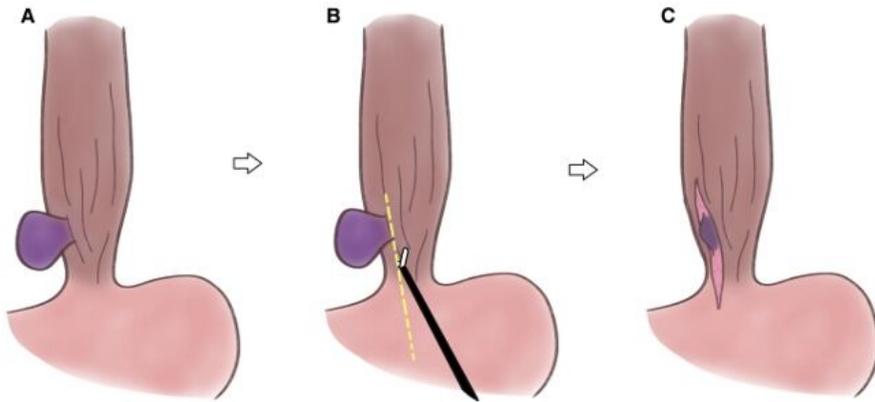
- **The exact mechanism that leads to its formation is unknown, but it involves loss of the coordination between pharyngeal contraction and opening of the upper sphincter. Lead to increase intraluminal pressure and **pulsion** of mucosa and sub mucosa through muscular layer.**
- **When the diverticulum is small, symptoms largely reflect this incoordination with predominantly pharyngeal dysphagia. As the pouch enlarges, it tends to fill with food on eating, and the fundus descends into the mediastinum. This leads to halitosis and oesophageal dysphagia**



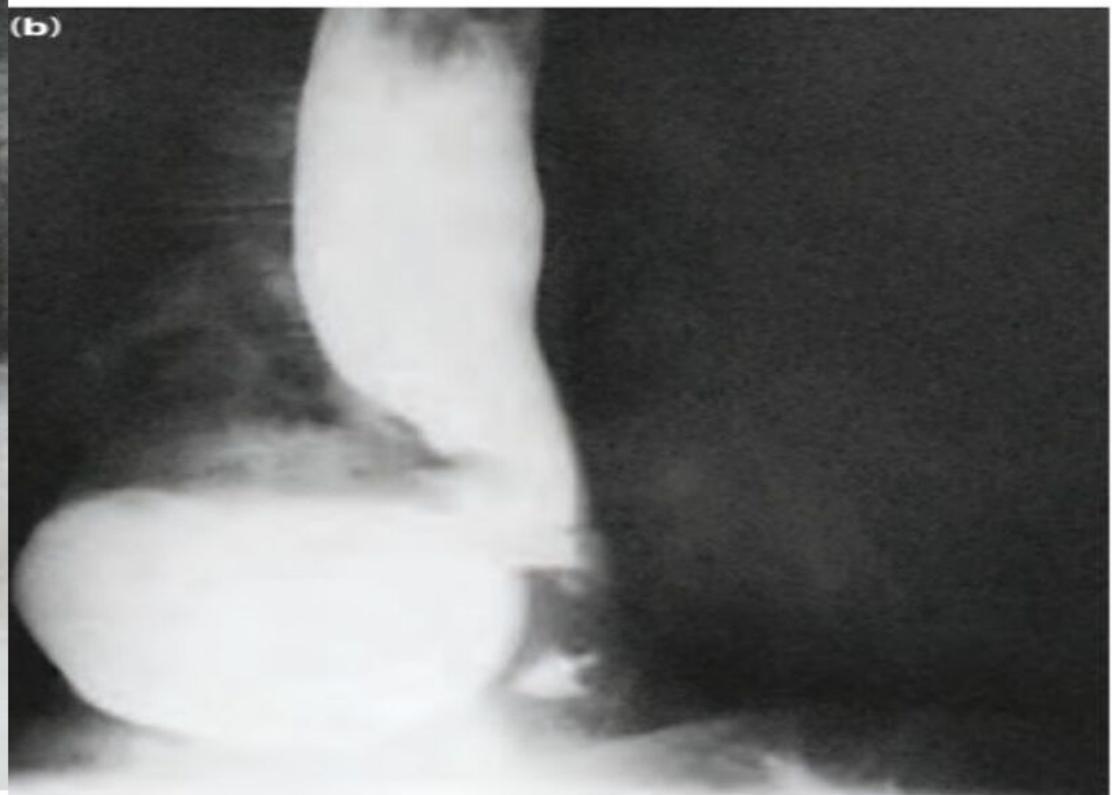
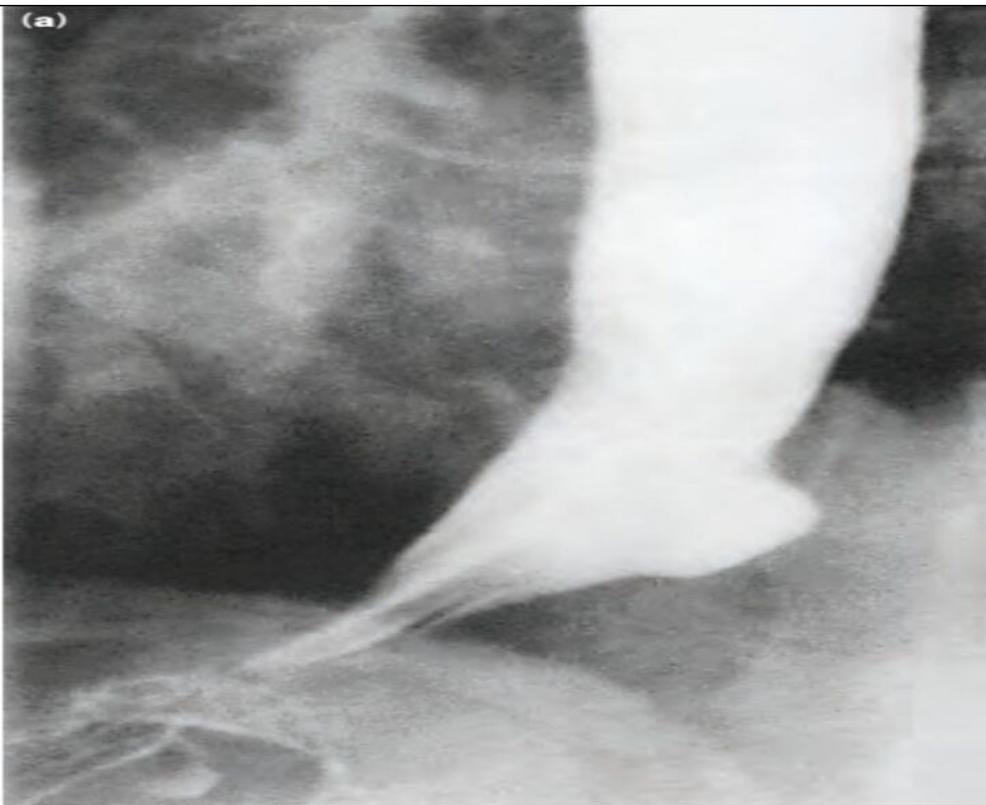
**Figure 62.62** Midoesophageal diverticulum with a trachea-oesophageal fistula.

- **Midoesophageal diverticula are usually small traction diverticula type is more common and associated with granulomatous disease so it also more common in tracheoesophageal fistula formation**





- Epiphrenic diverticula are pulsion diverticula situated in the lower oesophagus above the diaphragm
- They may be quite large, but cause surprisingly few symptoms.
- They again probably reflect some loss of coordination between an incoming pressure wave and appropriate relaxation of the LOS.
- Large diverticula may be excised, and this should be combined with a myotomy from the site of the diverticulum down to the cardia to relieve functional obstruction.



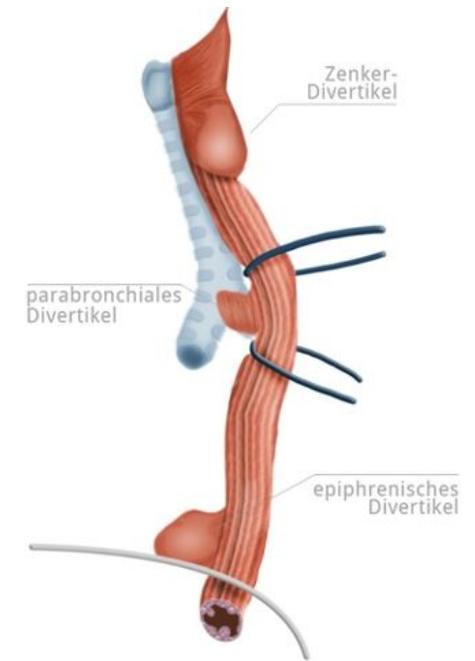
**Figure 62.65** Epiphrenic diverticulum proximal to the gastro-oesophageal sphincter. **(a)** Small and asymptomatic; **(b)** large, symptomatic and appearing as a gas-filled bubble on the chest radiograph.

- **Symptoms:**

- Difficulty swallowing (dysphagia)
- Regurgitation of undigested food
- Coughing or aspiration
- Halitosis (bad breath)

- **Diagnosis:**

- **Barium swallow (esophagram):** Best for determining size and location.
- **Endoscopy:** To rule out malignancy or other complications (careful to avoid perforation)



# Gastric diverticulum:

## Definition & Incidence

- Gastric diverticula (GD) are outpouchings of the stomach wall that often form in the fundus.
- GD are the least common gastrointestinal diverticula, and are very rare anatomic abnormalities overall.
- In fact, they are usually discovered incidentally during routine diagnostic testing
- Equally affects men and women, typically seen in ages 50-70.



# Symptoms

- **Most individuals with GD are asymptomatic.**
- **Symptomatic cases may experience:**
  - **\* Epigastric pain, nausea, vomiting, dyspepsia, early satiety**
  - **\* Postprandial fullness, belching, halitosis, anorexia, and dysphagia**

|               | Congenital  | Acquired  |
|---------------|---|---|
| True or false | True involved all layers  | False involved just mucosa and submucosa  |
| Prevalence    | %70 More common   | %30 Less common   |
| Site          | Fundus<br>near to pylorus think about If aberrant pancreatic tissue | Antrum  |
| Mechanism     | Congenital  | Two mechanism<br>Pulsion:increase intraluminal (chronic cough) pressure<br>Traction<br>contraction force from :<br>adherent inflammatory process (peptic ulcer) |

# **Investigation**

- **Often found incidentally during diagnostic exams for gastrointestinal symptoms.**
- **Radiological: Upper GI contrast radiography, abdominal CT with oral contrast.**
- **Endoscopy: Essential for suspicious GD to check for malignancy risk, with biopsy for raised/irregular borders.**

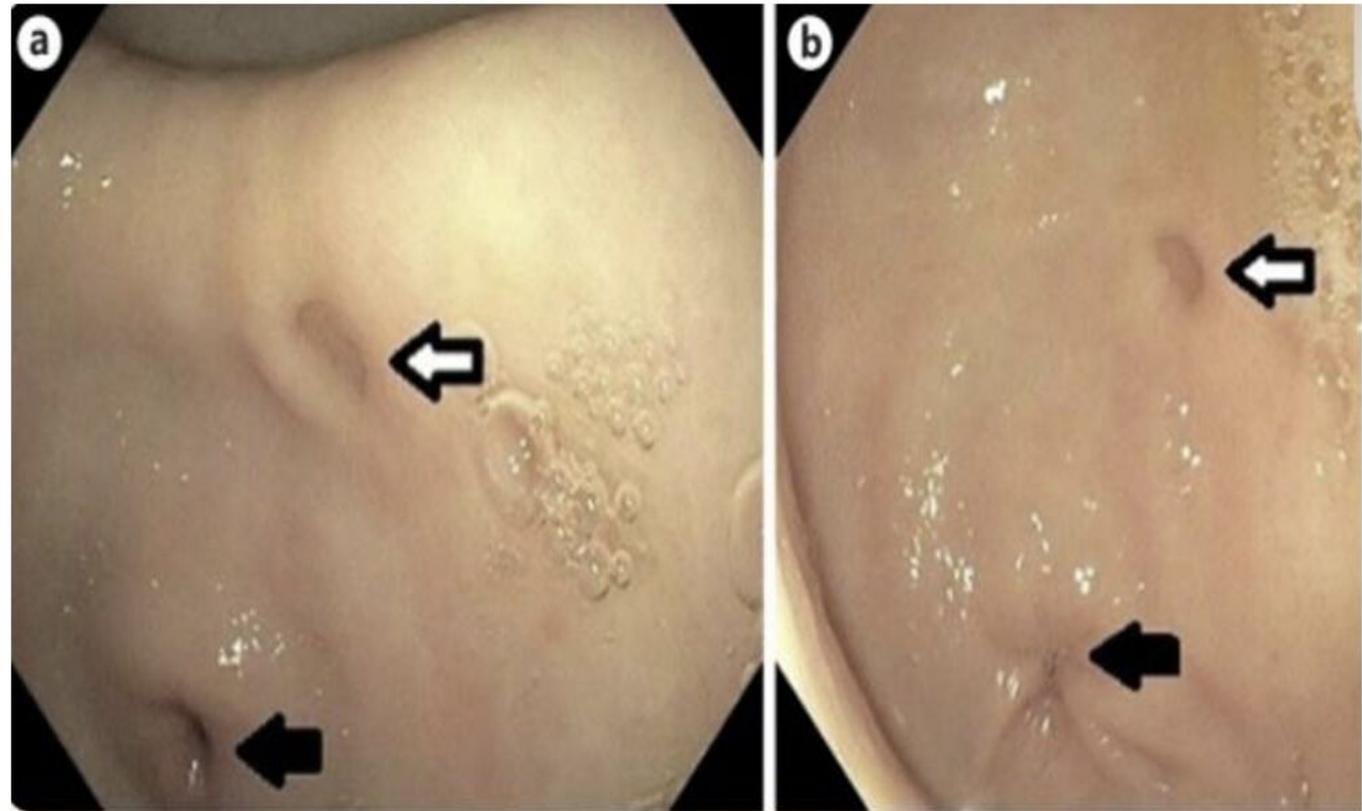
Upper gastrointestinal contrast radiographic study. .

Oral contrast was administered through a gastrostomy tube.

The patient was discovered to have a gastric diverticulum (arrows) along the greater curvature of the distal stomach.



- Endoscopic view of a gastric diverticulum (white arrows) located in the antrum. The pylorus (black arrows) is visible in the lower left part of the images



# Management

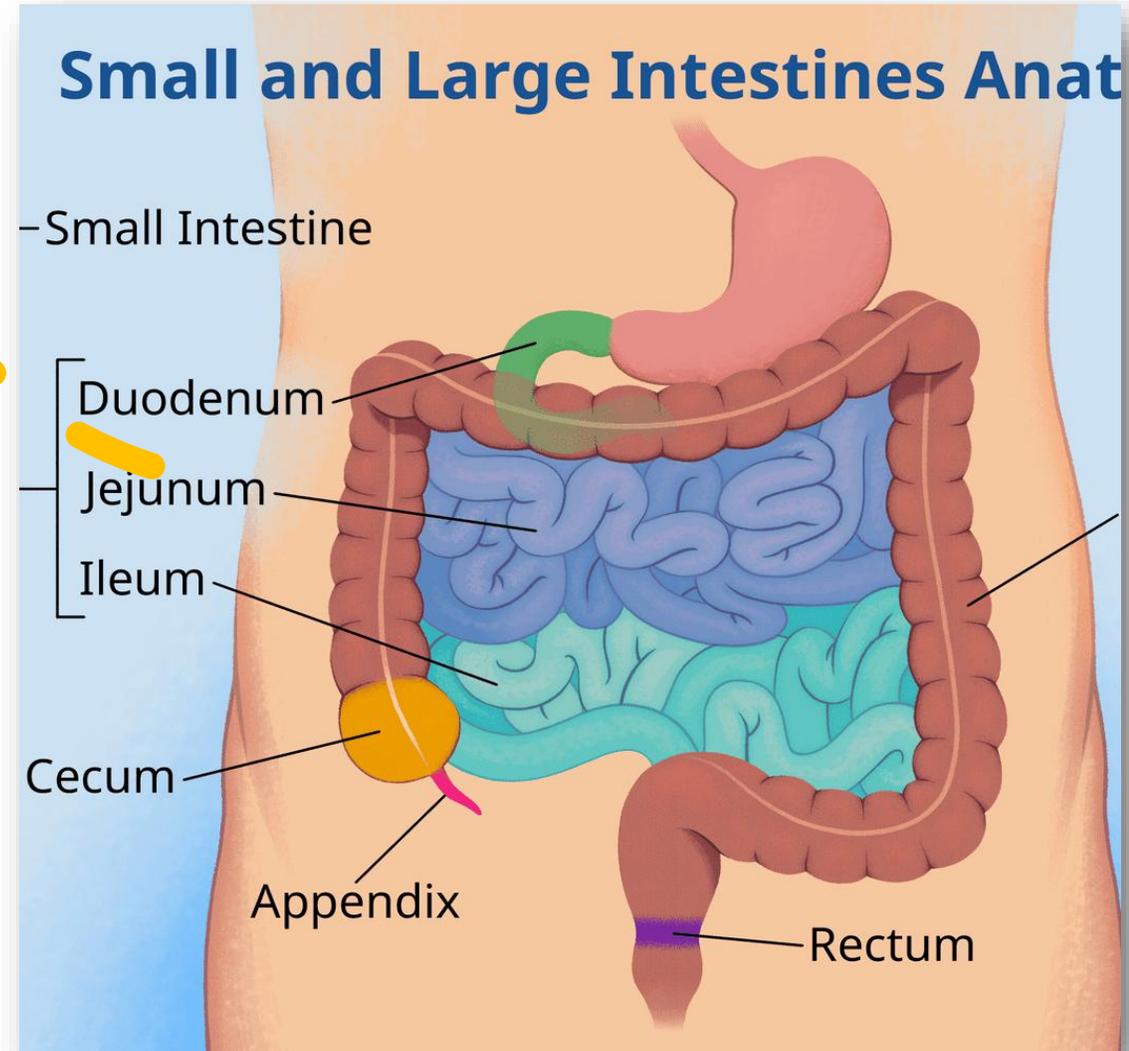
- **management of GD depends largely on the severity of the presenting complaints.**
- **Asymptomatic: No treatment required.**
- **Symptomatic: Begin with medical management (PPI, antacids).**

# Surgical management

- **Surgical Indications: GD larger than 4 cm, persistent symptoms after PPI therapy, or presence of complications(Complications: Ulceration, bleeding , perforation, and possible malignant transformation)**
- **Surgical options: Laparoscopic (preferred) or open approach, involving resection of GD or affected stomach part.**

# Small bowel diverticulum

- The duodenum has 4 parts: superior, descending, horizontal, and ascending
- Except for its first part, the duodenum is largely retroperitoneal it has no mesentery and is covered by peritoneum only on its anterior surface.
- The B.supply of small intestine by sup. Mesenteric artery.
- The superior mesenteric vein joins the splenic vein to form the portal vein.

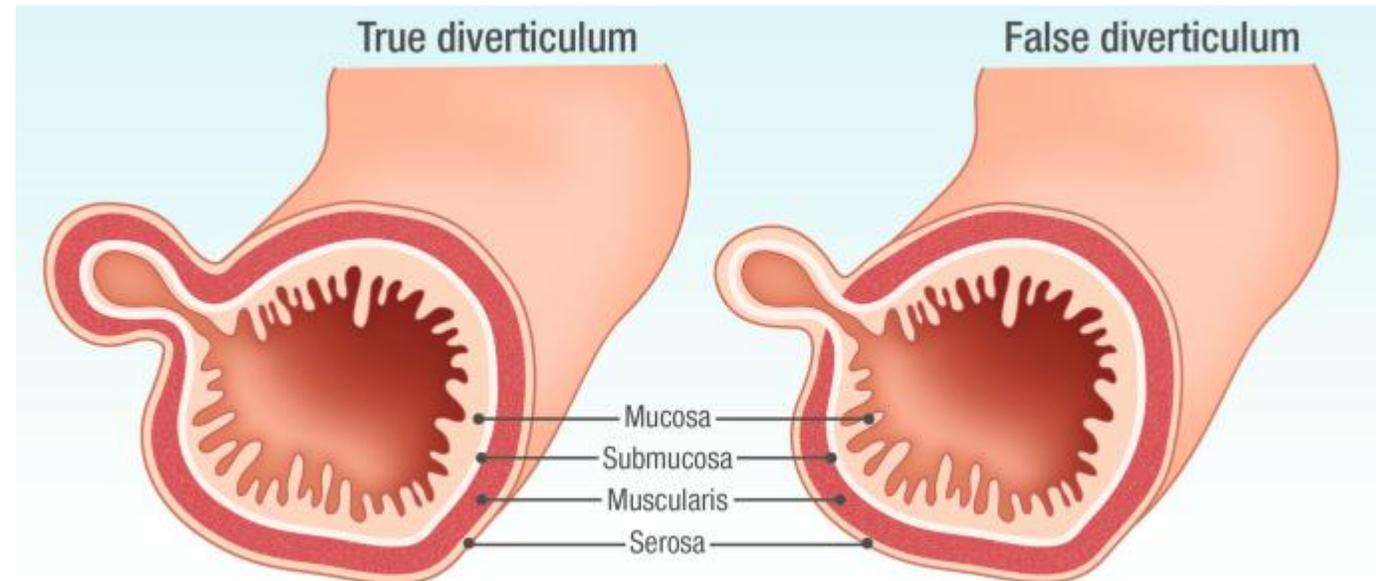


# ANATOMY

- The jejunum has a thicker wall and a wider lumen than the ileum and mainly occupies the left upper and central abdomen. with more prominent mucosal folds (valvulae conniventes)
- The ileum has a thinner wall and a smaller lumen than the jejunum and mainly occupies the central and right lower abdomen and pelvis. has more fatty mesentery with more complex arterial arcades. The ileum also contains larger aggregates of lymph nodes (Peyer's patches)

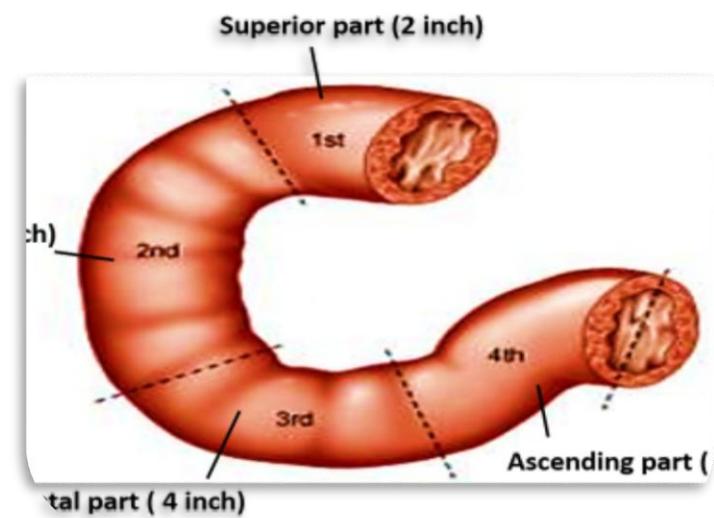
# Small bowel diverticulum

- Small bowel diverticula may be congenital or acquired. In congenital diverticula all three coats of the bowel are present in the wall of the diverticulum (e.g. Meckel's diverticulum)



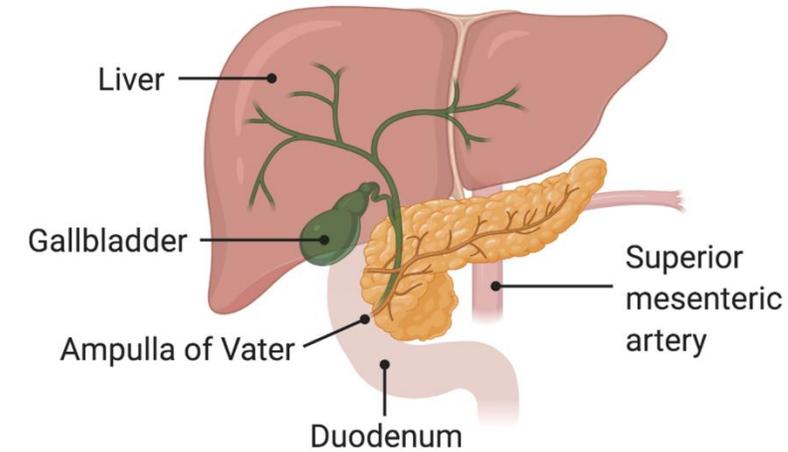
# Duodenal diverticulum

- Duodenal diverticula are weakened mucosal outpouchings
- A combination of increased intraluminal pressures and
- intrinsic weakness of the muscular layer is thought to play a role.
- most frequently located in the second portion of the duodenum, around or adjacent to the ampulla of Vater .
- The majority are acquired and asymptomatic .
- Approximately 5% become symptomatic or develop further complications .
- Clinicians often miss the diagnosis of a diverticulum since the signs and symptoms may mimic other diseases such as pancreatitis or cholecystitis.
- Due to the asymptomatic nature, many duodenal diverticula are incidental findings during upper endoscopies or barium studies .
- The incidence of duodenal diverticula is estimated to be around 20% in the general healthy population

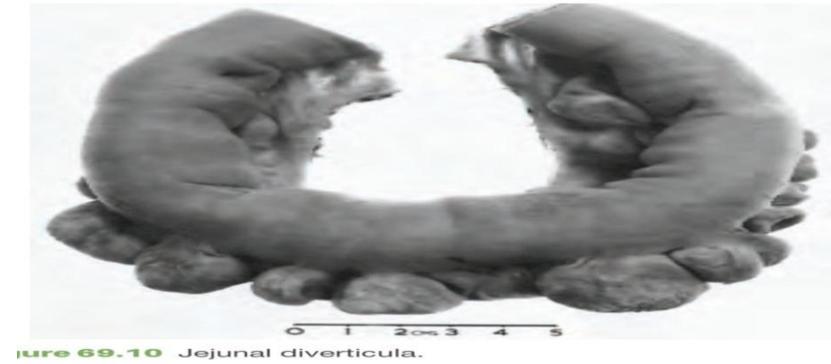


- can be classified as extraluminal or intraluminal.
- Intraluminal are classically congenital and occur due to incomplete recanalization of the intestinal lumen .
- Extraluminal are the most common type, and are acquired due to herniation of weakened mucosa by protruding large vessels .
- No specific gender predilection exists. It is rare to develop one before the age of 40, and peak incidence occurs between 50 to 70 years of age .
- The most common symptoms are ((upper abdominal pain radiating to the back, intermittent diarrhea, constipation and weight loss)).
- The differential diagnosis for small bowel diverticulum is:
  - 1- acute or chronic pancreatitis
  - 2-cholecystitis
  - 3- small bowel obstruction
  - 4- peptic ulcer disease .

- The location of the duodenal diverticulum plays an important role in the nature of its complications. The closer the diverticulum is to the ampulla of Vater, the higher the chance of gallstone formation in the common bile duct.
- As the duodenum compresses the ampulla of Vater, there is more pressure on the common bile duct and pancreatic duct, which may lead to other complications such as cholangitis, cholelithiasis and pancreatitis.
- If left untreated, a perforated diverticulum may lead to a more complicated surgical management.



# Jejunum diverticulum



- Acquired diverticulum , These invariably develop in the jejunum and arise from the mesenteric side of the bowel as a result of mucosal herniation at the point of entry of the blood vessels.
- There is thus no muscularis layer present in the wall "False"
- Jejunal diverticulae can vary in size and are frequently multiple. They are commonly asymptomatic and present as an incidental finding at surgery or on radiological imaging.
- they can result in malabsorption, as a result of **bacterial stasis**.
- or present as an acute abdominal emergency if they become inflamed or perforate.
- Bleeding from a jejunal diverticulum is a rare complication (compared with sigmoid diverticular disease).

- Elective resection of an affected small bowel segment that is causing malabsorption can be effective, provided there is only a limited amount of jejunum affected by the condition.
- If perforated jejunal diverticulitis is found at emergency laparotomy, a small bowel resection should be performed and a decision made between anastomosis and stoma formation.
- This will depend on the degree of contamination, physiological stability and local resources for managing a patient with a high output jejunostomy.
- Complications resulting from extensive jejunal diverticulosis can be extremely difficult to treat.
- In severe cases, much of the proximal small intestine may be involved, effectively precluding resection.
- Prolonged antibiotic therapy for bacterial overgrowth may be preferable, and antibiotics (metronidazole, ciprofloxacin, rifaximin) are frequently rotated in an attempt to avoid the development of antibiotic resistance.
- Limited resection, leaving remaining segments of affected jejunum, may be feasible, but may also fail to deal adequately with bacterial overgrowth, recurrent attacks of inflammation or bleeding.

# Meckel's diverticulum

- Congenital , True diverticulum
- Meckel's diverticulum is a persistent remnant of the vitellointestinal duct and is present in about 2% of the population.
- It is found on the antimesenteric side of the ileum, commonly ,approximately 60cm from the ileocecal valve and is classically 5cm long .
- It contains all three coats of the bowel wall and has its own blood supply.

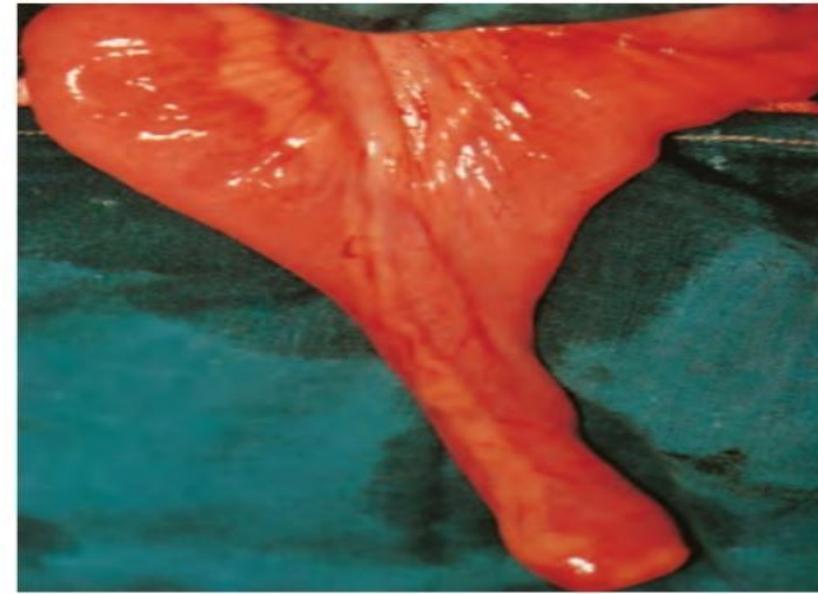


Figure 69.11 Meckel's diverticulum.

## MECKEL'S DIVERTICULUM

### Rule of 2's

- <2 years of age
- 2x more common in males
- 2% of population
- 2 feet proximal to ileocecal valve
- 2 inches in length
- 2% adults symptomatic
- 2 ectopic tissues present (gastric & pancreatic)



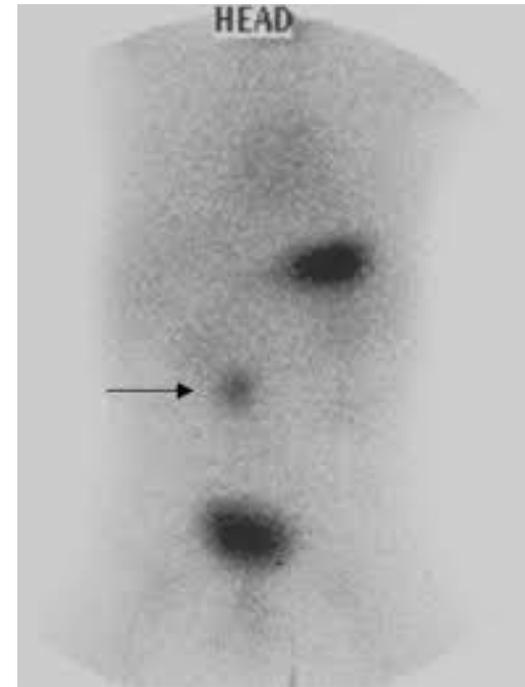
- It may be vulnerable to obstruction and inflammation in the same way as the appendix; indeed, when a normal appendix is found at surgery for suspected appendicitis, a Meckel's diverticulum should be looked for by examining the small bowel, particularly if free fluid or pus is found.
- In approximately 20% of cases, the mucosa of a Meckel's diverticulum contains heterotopic epithelium of gastric, colonic or pancreatic type.
- The presence of heterotopic mucosa may predispose to the development of complications.
- The vast majority of Meckel's diverticulae are asymptomatic and Meckel's diverticulum is notoriously difficult to see with contrast radiology.

# Meckel's diverticulum may, however, present clinically in the following ways:

**.1 Haemorrhage:** If gastric mucosa is present, peptic ulceration can occur and present as painless dark rectal bleeding or melaena.

If the stomach, duodenum and colon are excluded as a source of bleeding by endoscopy, radioisotope scanning with technetium-99m may demonstrate it.

• **2 Diverticulitis:** Meckel's diverticulitis presents like appendicitis, although if perforation occurs the presentation may resemble a perforated duodenal ulcer.



- **3. Intussusception:** A Meckel's diverticulum can be the lead point for ileoileal or ileocolic intussusception.
- **4. Chronic ulceration:** Pain is felt around the umbilicus, as the site of the diverticulum is midgut in origin.
- **5. Intestinal obstruction:** A band between the apex of the diverticulum and the umbilicus (also part of the vitellointestinal duct) may cause obstruction directly, or by predisposing to the development of a volvulus around it. .
- **6 Perforation**



Figure 69.12 Gangrenous Meckel's diverticulitis.

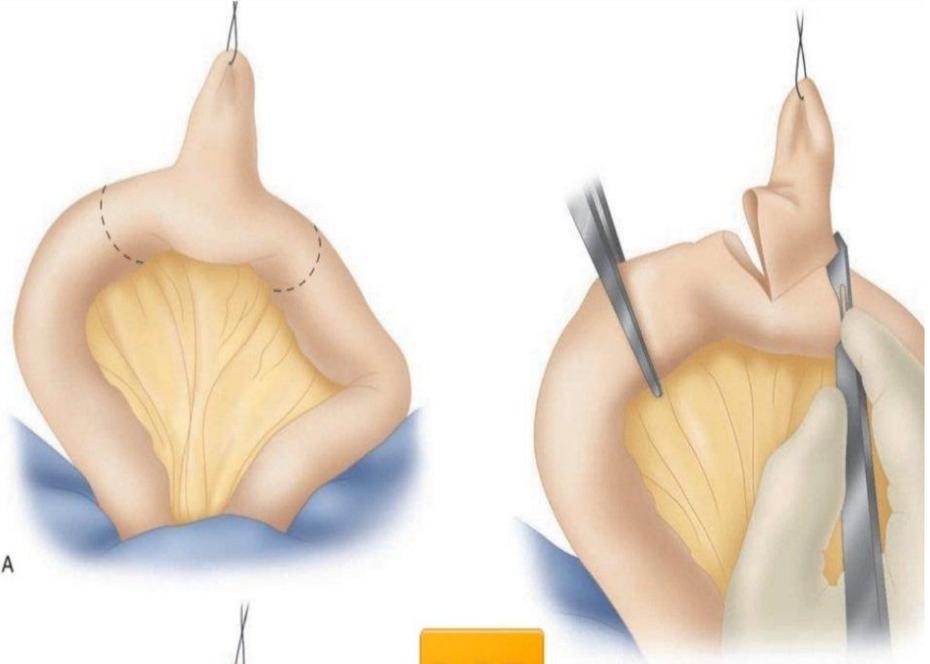
- When found in the course of abdominal surgery, a Meckel's diverticulum can safely be left alone.
- When there is doubt, it can be resected.
- The finding of a Meckel's diverticulum in an inguinal or femoral hernia has been described as **Littre's hernia**.

## Features of Meckel's diverticulum

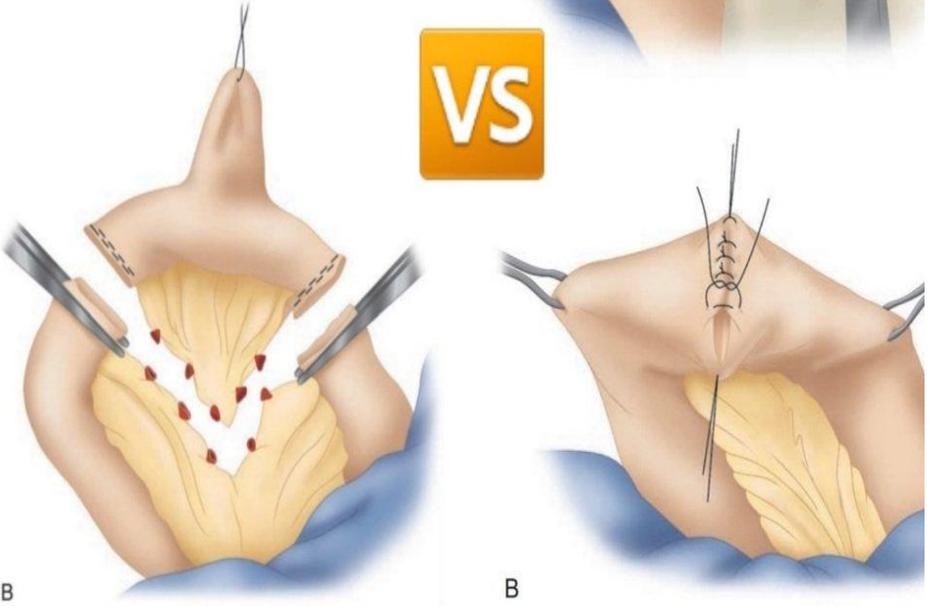
- Remnant of vitellointestinal duct
- Occurs in 2% of patients, 2 inches (5 cm) long, 2 feet (60 cm) from the ileocaecal valve, 20% heterotopic epithelium
- Should be looked for when a normal appendix is found at surgery for suspected appendicitis
- If a Meckel's is found incidentally at surgery, it can be left provided it has a wide mouth and is not thickened
- Can be source of gastrointestinal bleeding if it contains ectopic gastric mucosa

# Meckel's diverticulectomy

- A broad-based Meckel's diverticulum should not be amputated at its base and invaginated (as for an appendix), as there is the risk of stricture and of leaving heterotopic epithelium behind.
- It is safer simply to excise the diverticulum, either by resecting it and suturing the defect at its base, or with a linear stapler-cutter.
- If the base of the diverticulum is indurated, it is on balance more logical to perform a limited small bowel resection of the involved segment followed by an anastomosis.



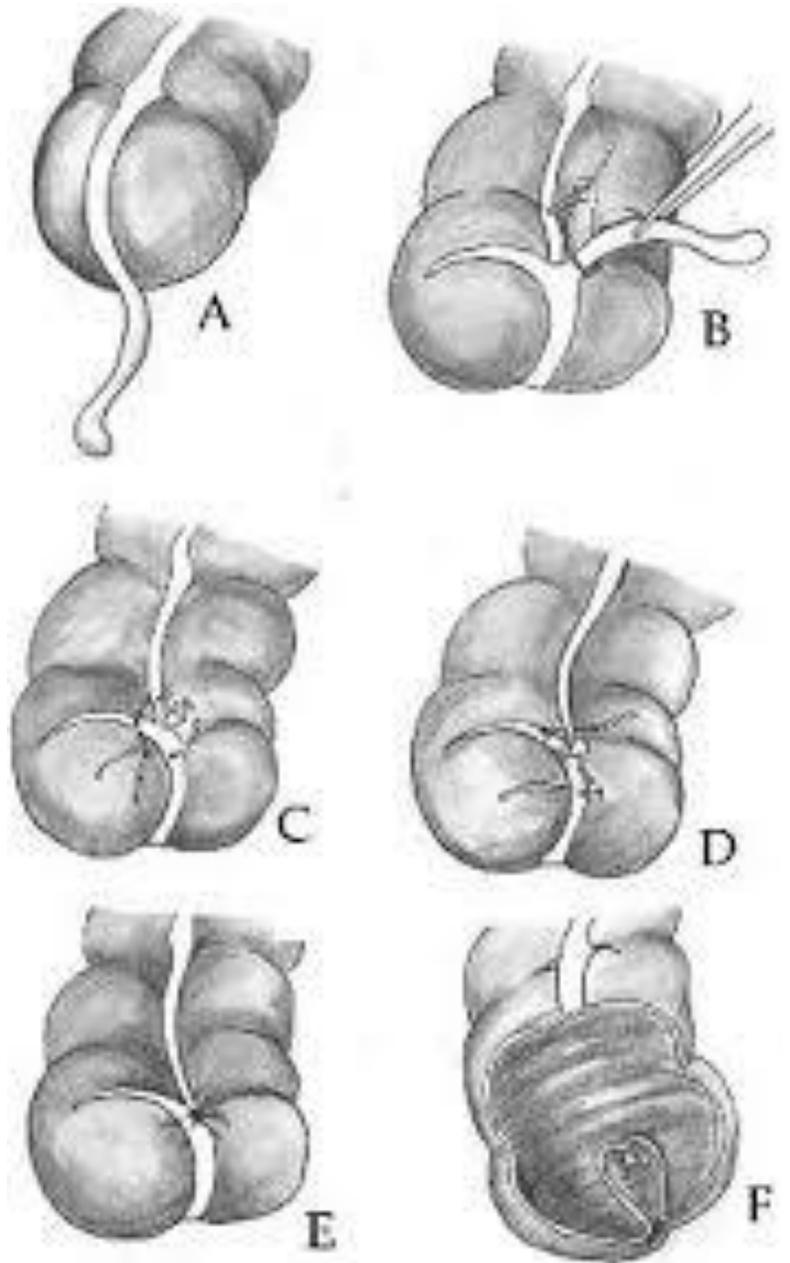
**VS**



# Surgical Staplers

Linear Cutter

Meckel's  
Diverticulectomy



**FIGURE 77.3** For a bleeding Meckel diverticulum, an ileal resection is performed (A) with control of the proximal and distal bowel content using bowel clamps (B) prior to creating an anastomosis. (From Chung DH. Meckel's diverticulectomy. In: Townsend CM Jr, Evers BM, eds. *Atlas of General Surgery Techniques*. Philadelphia: Saunders; 2010.)

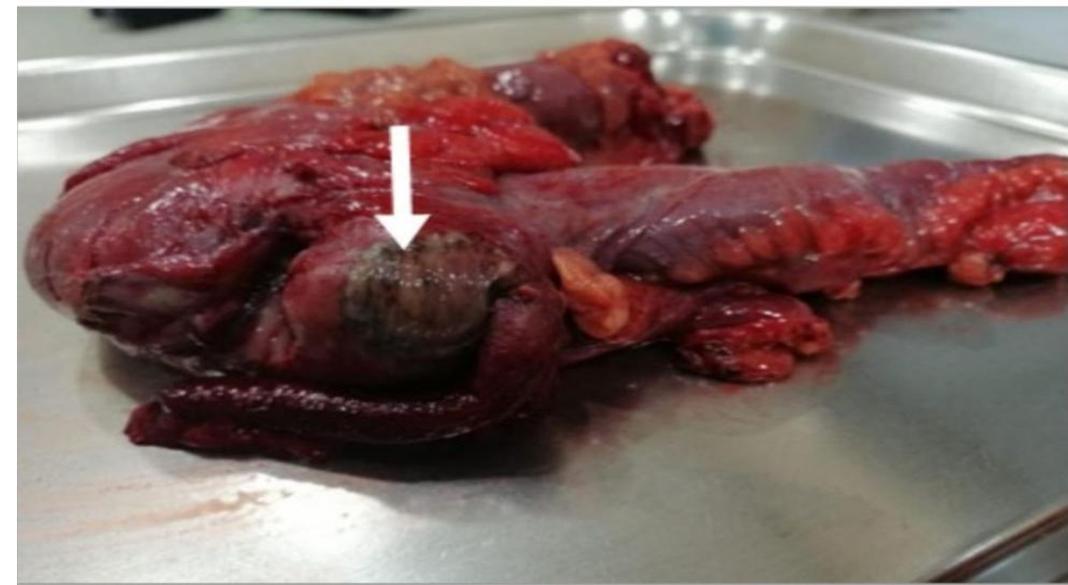
**FIGURE 77.4** For a nonbleeding Meckel diverticulum, a v-shaped diverticulectomy (A) is performed with a two-layer transverse closure (B). (From Chung DH. Meckel's diverticulectomy. In: Townsend CM Jr, Evers BM, eds. *Atlas of General Surgery Techniques*. Philadelphia: Saunders; 2010.)

# Cecal diverticulum

- The cecal diverticula are usually solitary and are situated in the area from 1 cm proximal to 2 cm distal to the ileocecal valve.
- Most of them arise from the anterior aspect of the cecum; therefore when inflamed they tend to perforate and cause acute, localized peritonitis.
- However, an acutely inflamed solitary cecal diverticulum is an uncommon cause of an acute abdomen.
- The cecal diverticulum is a rare disease with reported incidence of 0.04% to 2.1% (1–3). The condition is uncommon in the Western countries, where 85% of diverticulum occurs more commonly in the descending and sigmoid colon rather than in cecum .
- The average age for the development of this condition is about 43.6 years with male predominance



- The disease is frequently misdiagnosed at the time of its occurrence.
- The symptoms and signs of the disease are well known to closely mimic acute appendicitis with abdominal pain, low-grade fever, nausea, vomiting, abdominal tenderness, and leukocytosis .
- Most authors agree that only few of the patients are correctly diagnosed with acute diverticulitis preoperatively, since it is clinically indistinguishable from appendicitis and is often confused with carcinoma of the cecum during the operation.



Surgical piece. Right colon and cecal tumor (shown by arrow).

- Imaging studies on the other side could distinguish between right-sided diverticulitis and acute appendicitis with high accuracy and therefore they have the benefit of avoiding unexpected findings during the operation .
- In most cases, the correct diagnosis of cecal diverticulitis is often made intraoperatively during exploration of suspected acute appendicitis . However, even intraoperatively, the correct diagnosis is often indistinguishable from acute appendicitis due to extensive inflammation.



- Controversies exist regarding the optimal management in nonperforated cecal diverticulitis, ranging from conservative approach with intravenous antibiotics to surgical procedures such as diverticulectomy and right hemicolectomy .
- The management approach should be based on the **clinical presentation** of the patient, the **intraoperative findings**, and the **surgeon's experience**.



Diverticulitis on the anterior aspect of cecum (Right Hemicolectomy).



# Management

- Patients with asymptomatic small intestinal diverticulosis does not require treatment. The management in symptomatic patients is based on the clinical presentation. Surgical management is reserved for bowel perforation, fistula, or abscess and in patients with refractory gastrointestinal bleeding.
- Antibiotic therapy is typically begun after confirming SIBO by breath test or duodenal aspirate and culture.
- Acute diverticulitis – Management of patients with acute uncomplicated diverticulitis typically includes a restricted diet and antibiotics. Surgical management is reserved for small bowel diverticulitis complicated by bowel perforation. This may require open or laparoscopic-assisted resection of the involved segment. For symptomatic intraluminal duodenal diverticula, duodenotomy and excision are usually necessary for removal.
- The management of small bowel diverticular bleeding includes resuscitation.
- Small bowel obstruction from enterolith impaction of diverticula may be treated with enterotomy and stone extraction or manual crushing and milking the stone distally into the colon.

## TERMINOLOGIES

Diverticula : pouch like protrusions

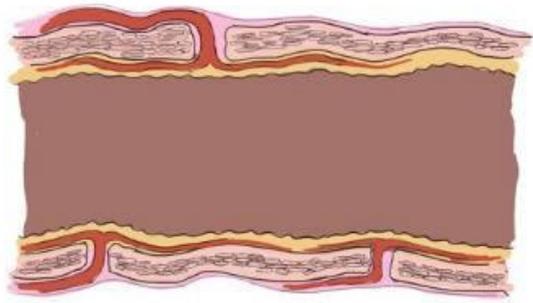
Diverticulosis :The presence of multiple diverticula generally implies to an absence of symptoms

Diverticular disease : Any clinical features caused by diverticulae including complications

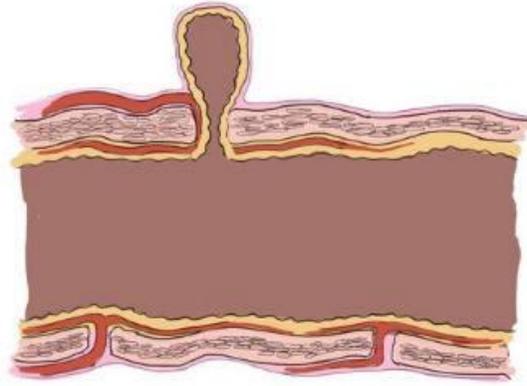
Diverticulitis : presence of inflammatory process associated with diverticulae

# Colonic diverticula

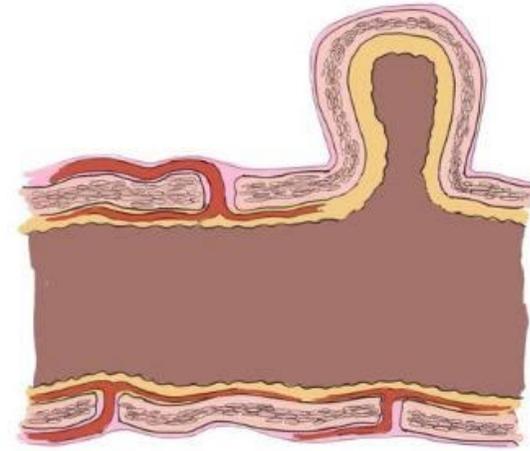
- Diverticulosis is a sac-like protrusion in the colonic wall, develops as a result of herniation of mucosa and submucosa through a point of weakness in the muscular wall.
- Usually found between mesenteric & antimesenteric taenia
- Occurs at the weak sites in the circular m., mesenteric vessels penetration.
- Elevated I.L. pressure by tonic & rhythmic contractions result in segmentation “nonpropulsive”
- Contractions produce isolated segments”
- Thickening of longitudinal & circular muscles can lead to narrowing of colonic lumen
- Colonic diverticula are more commonly found in the sigmoid but can affect the whole colon, rarely affect the rectum



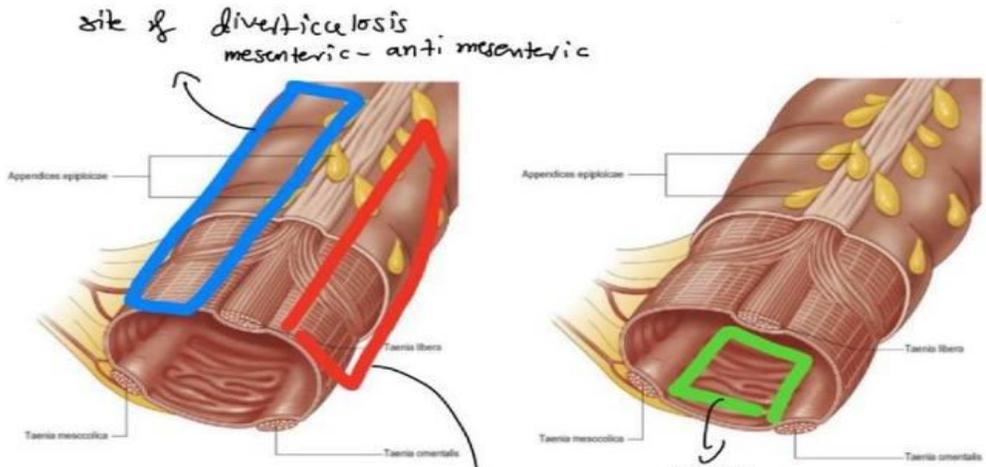
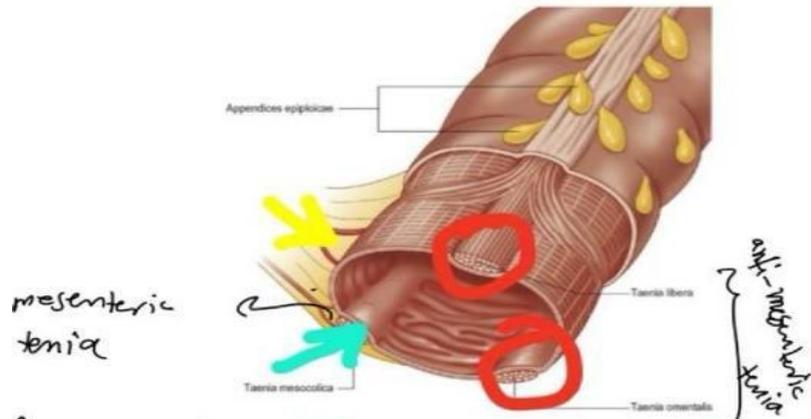
Normal



Pseudodiverticulum



True diverticulum



site of diverticulosis  
mesenteric - antimesenteric

mesenteric - antimesenteric  
diverticulosis

the site  
for Meckel's  
bet. 2 anti-mesenteric tenia

# Pathophysiology

The formation of diverticula is considered multifactorial.

- Increased intraluminal pressure  
e.g., due to chronic constipation
- Weakness of the intestinal wall

Age-related loss of elasticity of the connective tissue

Physiological gaps in the intestinal wall, which occur where blood vessels penetrate, predispose to protrusion and herniation of intestinal mucosa and submucosa



# Clinical features

Usually asymptomatic

May manifest with abdominal discomfort or pain, especially if associated with chronic constipation or Diverticular bleeding

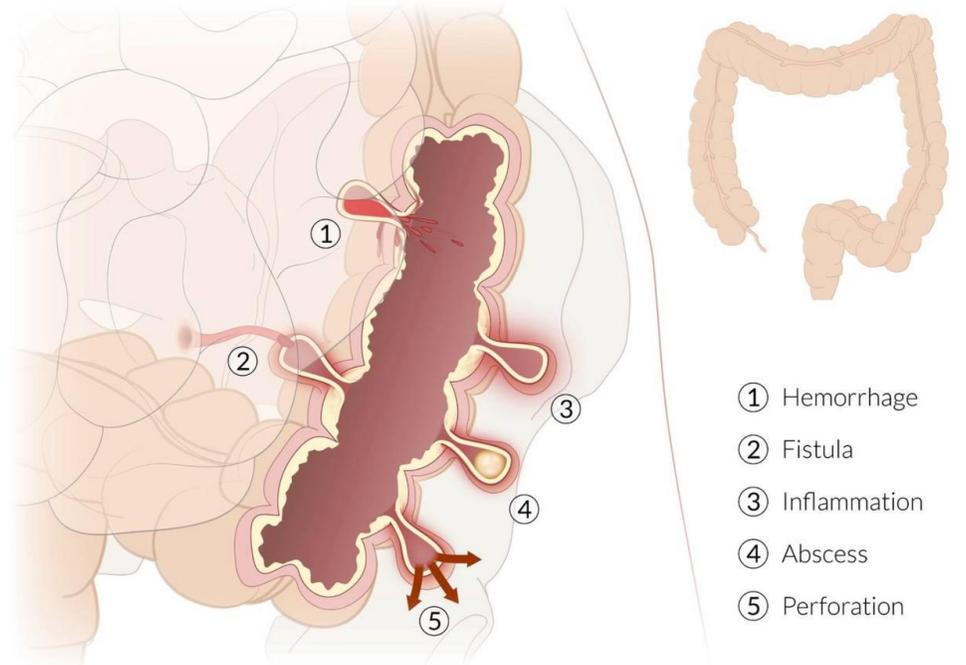
- These symptoms are thought to result from a combination of increased luminal pressure affecting wall tension and increased visceral hypersensitivity.

# Complications of diverticular disease

- The majority of patients with diverticula are asymptomatic but historical studies suggest that somewhere between 10 and 30% will have symptomatic complications

## Complications of diverticular disease

- Diverticulitis
- Abscess
- Peritonitis
- Intestinal obstruction
- Haemorrhage
- Fistula formation



# Complications

## Diverticular bleeding

Diverticulosis is the most common cause of lower GI bleeding in adults.

Occurs in ~ 5% of individuals with diverticulosis

Etiology: erosions around the edge of diverticula

## Clinical findings

Painless hematochezia

Signs of anemia may be present if recurrent

Severe or ongoing bleeding: significant drop in hemoglobin → hemodynamic instability (hypotension, tachycardia, dizziness, reduced level of consciousness)

In 70–80% of cases, bleeding ceases spontaneously

Endoscopic hemostasis during colonoscopy (e.g., epinephrine injection, thermal coagulation, ligation)

Angiography with vessel embolization

- Fistula formation (colovesical, colovaginal, enterocolic, colocutaneous): occurs in 5% of cases, **colovesical** fistulation is most commonly seen.
- The presentation of a fistula resulting from diverticular disease depends on the site. The most common colovesical fistula results in recurrent urinary tract infections and pneumaturia (flatus in the urine) or even faeces in the urine. Colovaginal fistulae are more common after hysterectomy.
- Rarely, diverticular disease may perforate into the retroperitoneum, leading to a psoas abscess, and even groin fistulation.

# Diverticulitis

Clinical features ::

Low-grade fever

Sigmoid colon most commonly affected → left lower quadrant pain

Possibly tender, palpable mass (pericolonic inflammation)

Change in bowel habits (constipation in ~ 50% of cases and diarrhea in 25–35% of cases)

↑ Urinary urgency and frequency (in ~ 15% of cases), sterile pyuria ( reactive cystitis )

Acute abdomen: indicates possible perforation and peritonitis

# Approach :

- Suspect acute diverticulitis in adult patients presenting with LLQ pain, fever, and leukocytosis.
- The diagnosis is typically confirmed with imaging, preferably CT abdomen with IV contrast.
- Consider colonoscopy to screen for malignancy once the acute phase has resolved and the risk of perforation is reduced

# Imaging

## CT abdomen and pelvis with IV contrast

### Indications

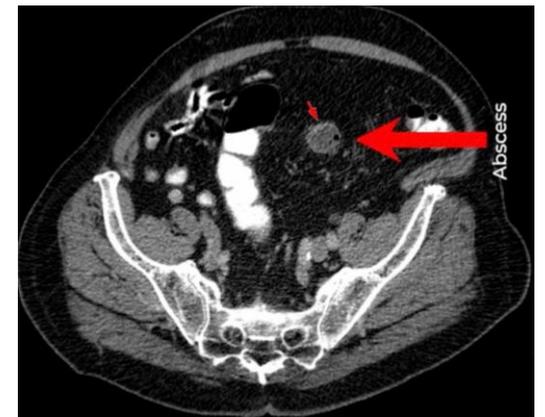
- Preferred initial imaging modality for suspected diverticulitis
- Diagnostic confirmation in patients with no prior imaging studies
- Staging the severity of diverticulitis

### Supportive findings

- Colonic outpouching
- Signs of inflammation
- Bowel wall thickening  $> 3$  mm
- Peridiverticular mesenteric fat stranding

### Complications may also be identified

- Peridiverticular abscess: hypodense collections with peripheral contrast enhancement
- Diverticular perforation: pneumoperitoneum
- Intestinal obstruction: dilated intestinal loops with multiple air-fluid levels



## **Abdominal x-ray**

Not useful in diagnosing uncomplicated diverticulitis

### Indications

Suspected perforation or bowel obstruction

May be performed as part of the routine workup for acute abdominal pain

Findings that may be seen in complicated diverticulitis include

Bowel perforation: pneumoperitoneum

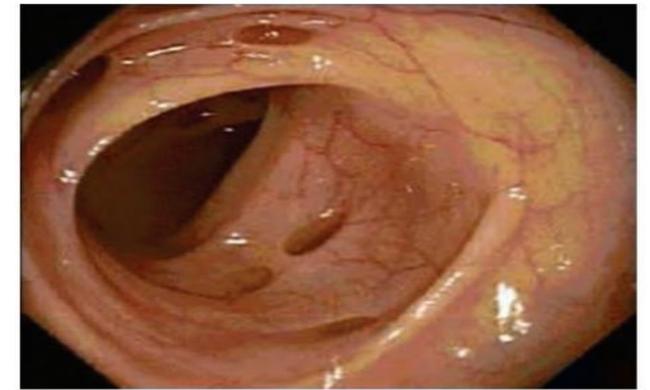
Bowel obstruction: dilated bowel loops and multiple air-fluid levels

## **Screening colonoscopy**

Recommended 6–8 weeks after the resolution of the acute episode to assess the extent of diverticulitis and rule out malignancy

Colonoscopy is contraindicated during an acute episode because of the increased risk of perforation.

Not required if a recent evaluation of the colon has been performed



**Figure 70.21** Colonoscopic view of sigmoid diverticula. Note the mouths of diverticula between the hypertrophied colonic walls.

# MODIFIED HINCHEY CLASSIFICATION OF DIVERTICULITIS

| STAGE | DESCRIPTION<br><small>WWW.OPENMED.CO.IN</small>   | MANAGEMENT                         |
|-------|---|------------------------------------|
| 0     | Mild clinical diverticulitis (left lower quadrant abdominal pain, low grade fever, leukocytosis)  | Oral Antibiotics                   |
| Ia    | Confined pericolic inflammation or phlegmon              | Antibiotics +/- CT Guided Drainage |
| Ib    | Confined pericolic abscess  | Antibiotics +/- CT Guided Drainage |
| II    | Distant Abscess   | Abscess Drainage                   |
| III   | Purulent Peritonitis                                   | Hartmann's Surgery                 |
| IV    | Fecal Peritonitis <br><small>WWW.OPENMED.CO.IN</small> | Hartmann's Surgery                 |

## Management of uncomplicated diverticulitis

Conservative management

Supportive care

Relative bowel rest: clear liquid diet until improvement of symptoms

Analgesics

Antiemetics

Consider broad-spectrum oral antibiotics(ciprofloxacin and metronidazole)

# Management of complicated diverticulitis

**Inpatient management with broad-spectrum IV antibiotics is recommended.**

## **Abscess**

Size < 4 cm: trial of conservative management with IV antibiotics

Size  $\geq$  4 cm

Ultrasound- or CT-guided percutaneous drainage

Consider laparoscopic or open surgical drainage if percutaneous drainage is not feasible.

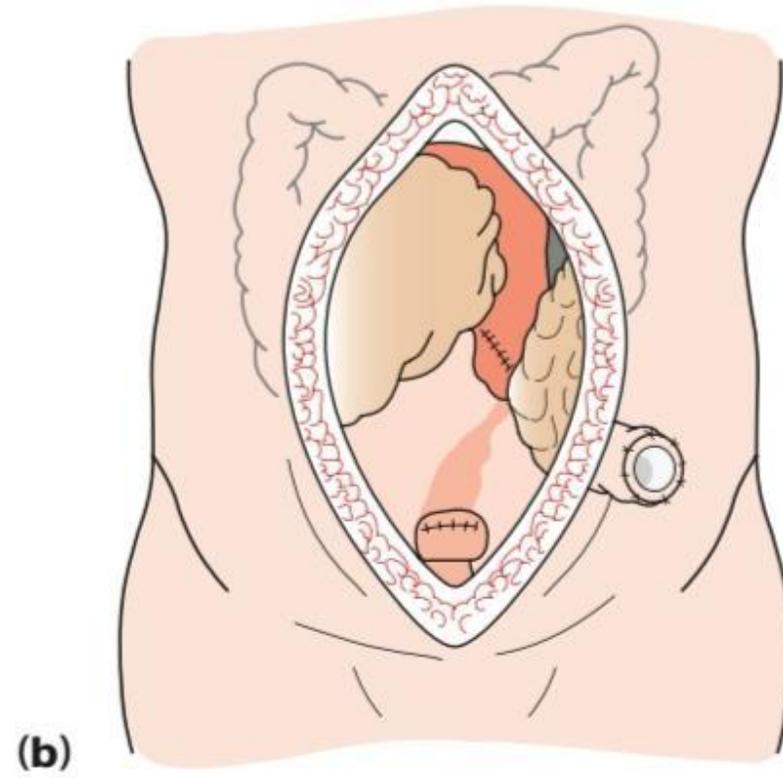
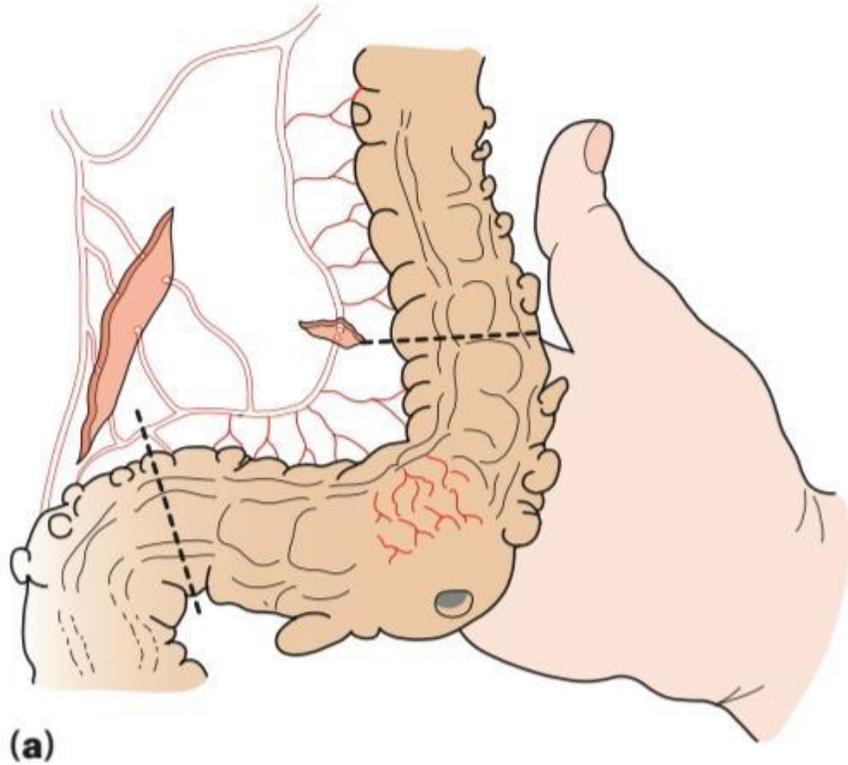
Continue IV antibiotic therapy.

Send aspirate or pus for cultures and tailor antibiotic treatment accordingly.

**Perforation with generalized peritonitis:** emergency surgery

Hemodynamically stable patients: laparoscopic or open colectomy and primary anastomosis with/without a temporary diverting stoma

Critically ill patients: Hartmann procedure



**Figure 70.22** (a) Perforated sigmoid diverticular disease. (b) The Hartmann procedure – oversewn rectal stump and left iliac fossa colostomy.

## Long-term management

### Elective colectomy

#### Indications

Routinely recommended 6–8 weeks after resolution of complicated diverticulitis

Select groups of patients after resolution of uncomplicated diverticulitis, including:

Patients at high risk of recurrence with complications

Patients with persistent abdominal symptoms after resolution of an acute episode

Chronic complications of diverticulitis (e.g., fistula, colonic strictures)

Procedure: laparoscopic or open colectomy

#### Summary box 70.10

##### Principles of surgical management of diverticular disease

- Hartmann's procedure is the safest option in emergency surgery
- Primary anastomosis can be considered in selected patients
- Elective resection may be offered for recurrent attacks
- Definitive treatment of colovesical fistula will require resection