
بسم الله الرحمن الرحيم

Dysphagia & Carcinoma of Esophagus

Dr. Muhammad Shamim

Assistant Professor, Baqai Medical University

Dysphagia

- Greek *dys* (difficulty, disordered) and *phagia* (to eat)
- Sensation that food is hindered in its passage from the mouth to the stomach
- Most patients complain that food
  - "sticks," "hangs up," "stops," or "just won't go down right"
- Anatomically classified into two categories:
  - Oropharyngeal
  - Esophageal.
- Psychiatric disorders can amplify this symptom.

History

Three questions are crucial:

1. What type of food or liquid causes symptoms?
   - Primarily solids
     - Structural lesion- peptic stricture, ring, or malignancy
   - Both solid and liquid
     - a motility disorder like achalasia or scleroderma

2. Is the dysphagia intermittent or progressive?
   - Esophageal rings tend to cause intermittent solid food dysphagia
   - Strictures and cancer cause progressive dysphagia

3. Does the patient have heartburn?
   - Complication of GERD- Esophagitis, stricture & Barrett's

- Location of dysphagia
- Weight loss
- Dietary changes
- Dysphagia must be distinguished from odynophagia
  - Associated with an inflammatory condition (esophagitis)

Examination

- Head to toe
  - Signs of wasting
  - Examine the mouth
  - Palpate the neck (nodes, thyroid, supraclavicular fossae)
  - Examine the abdomen

Diagnostic Tools

- Esophagogram
- Endoscopy
- Esophageal Manometry
- pH probe
- Esophageal Ultrasound
- CT, MRI

Esophagogram

- Double-contrast barium esophagogram
- Usually the first specific diagnostic test in the evaluation of esophageal dysphagia
- Detect subtle narrowing or esophageal webs that may not be appreciated on endoscopy

Endoscopy

- Procedure of choice to evaluate the mucosa of the esophagus
- Detection of structural abnormalities

- **Flexible esophagoscopy**
  - Transorally
  - Diameters approaching 1cm
  - Allows the insufflation of air to distend the esophagus and more easily see all of the mucosa
  - Magnified view, suction, irrigation, and biopsy ports.
  - If mucosal lesions or irregularities are found multiple biopsies are taken with biopsy forceps passed through the biopsy port

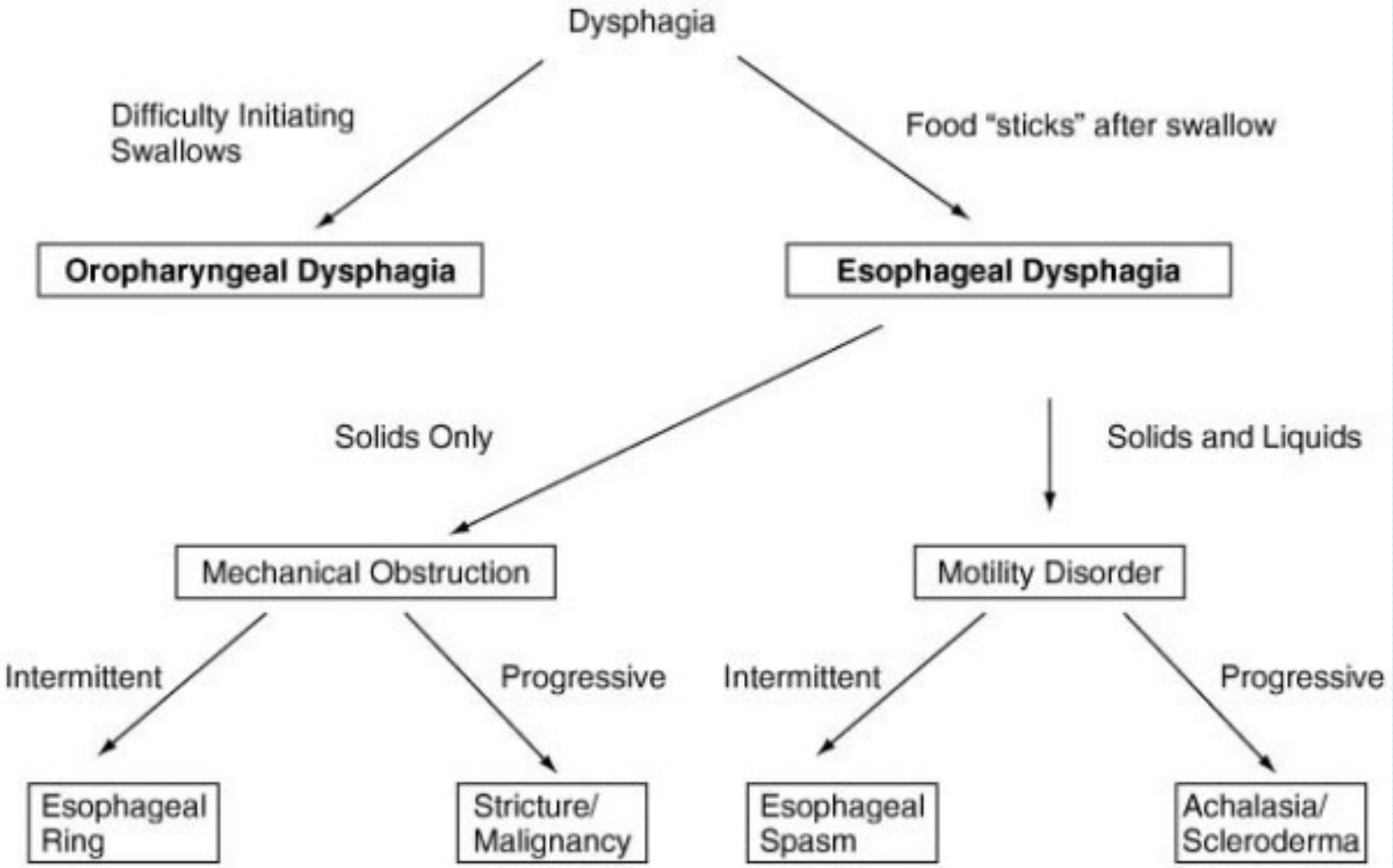
Esophageal Manometry

- Measures intraluminal pressures
  - LES, esophageal body & UES
- With each swallow
  - Strength
  - Timing
  - Sequencing of pressure events
- Indicated for patients who need recurrent intraluminal pressure assessment
  - Achalasia
  - Diffuse esophageal spasm

pH probe

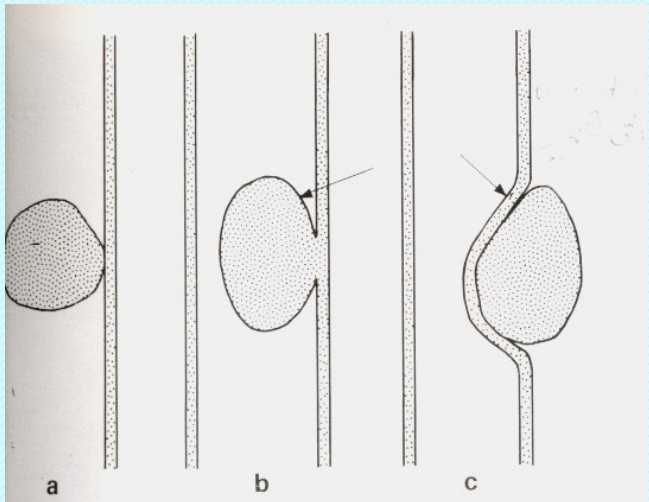
- Ambulatory 24-hour esophageal pH monitoring
  - Gold standard for the diagnosis of GERD
  - Detect and quantify gastroesophageal reflux

Causes of Dysphagia



CAUSES

- Intraluminal
- Intramural
- extramural



Filling defects shown diagrammatically in the
) Intraluminal; (b) intramural: note the sharp angle
nade with the wall; (c) extramural: there is a
ngle (arrow) with the wall of the bowel.

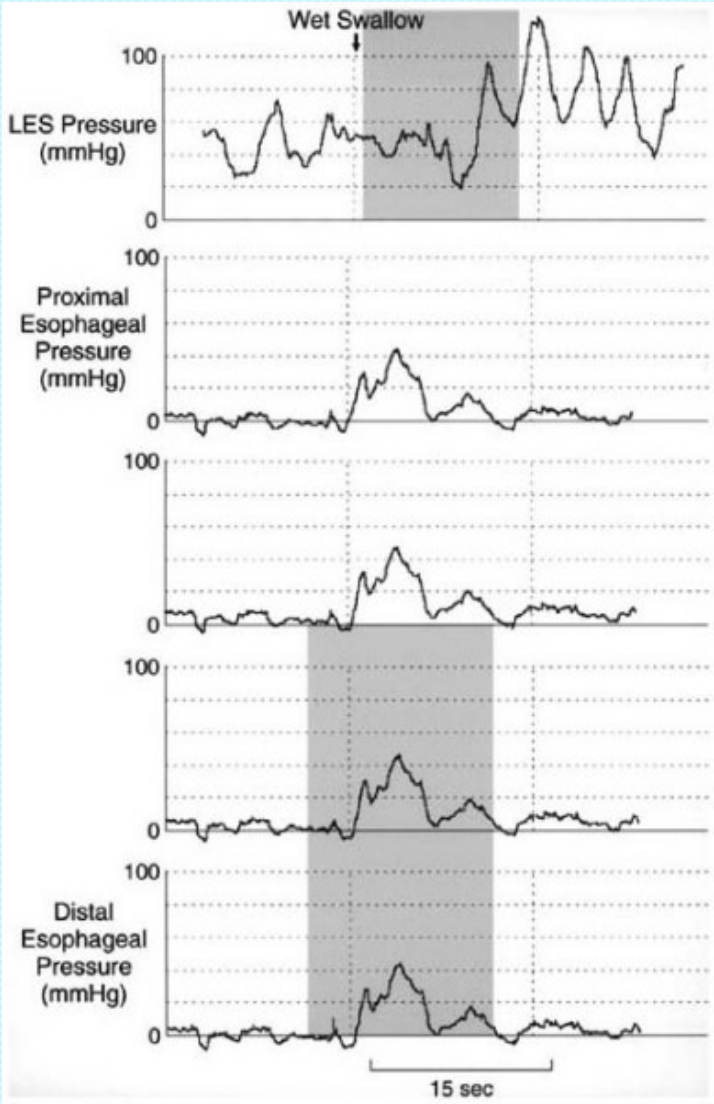
- **Dysphagia lusoria**
- **Rolling hernia**
- **Goitre**
- **Foreign body**
- **stricture/stenosis**
  - **Malignant**
    - **Adenocarcinoma**
    - **Squamous carcinoma**
  - **Benign**
    - **Leiomyoma**
    - **Polyps**
    - **Corrosive injury**
    - **Barret's esophagus**
- **Esophageal motility disorders**
  - **Achalasia**
  - **Diffuse esophageal spasm**

Achalasia

- Primary esophageal motility disorder
  - Insufficient LES relaxation
  - Loss of esophageal peristalsis
- Pathology
  - Loss of ganglion cell in the myenteric plexus
  - Infiltrate of T lymphocytes, eosinophils, and mast cells
- Symptoms
  - Dysphagia to solids and liquid
  - Regurgitation
  - Chest pain

- Diagnostic study
  - Barium esophagram
    - Esophageal dilation
    - Closed LES
    - Loss of peristalsis
    - Bird's beak

- Esophageal manometry
  - Establish the diagnosis
    - Absent or incomplete LES relaxation
    - Loss of peristalsis



- Endoscopy
  - Exclusion of pseudoachalasia by carcinoma at the GE junction

Treatment

- Pneumatic dilation
  - Should be a surgical candidates
    - 2% to 5% risk of perforation
  - After dilation need a gastrograffin study to exclude esophageal perforation
  - Good to excellent relief of symptoms in 50% to 93% of patients

- Surgical myotomy
  - Myotomy across the LES
  - Laparoscopy with a response rate of 80% to 94%
  - Complication- GERD in 10% to 20%

- High risk for pneumatic dilation or surgery
  - Botox
    - Effective in about 85% of patients
    - Symptoms recur in more than 50% of patients after 6 months
  - Pharmacologic treatment with nitrates or calcium-channel blockers

Diffuse esophageal spasm (DES)

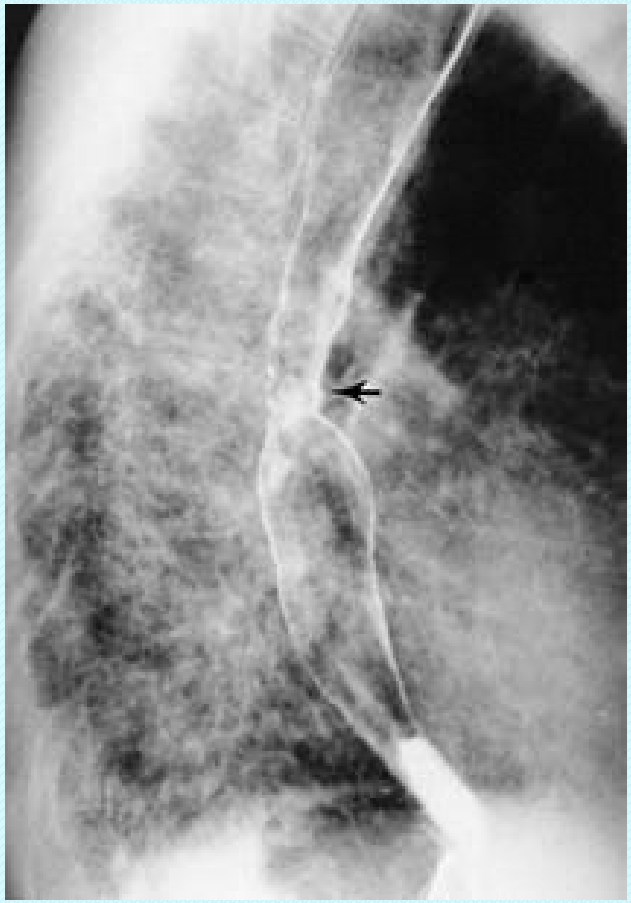
- Simultaneous and repetitive contractions in the esophageal body
- Normal LES relaxation

- Dysphagia if the contraction amplitudes are low
- Chest pain if the contraction amplitudes are high

- Diagnosis
  - Esophagogram
    - "corkscrew" esophagus
  - Manometry
    - Simultaneous and repetitive contractions in the esophageal body
- Treatment
  - Medications that relax the esophagus
    - Nitrates and calcium-channel blockers

Scleroderma

- Connective tissue disease
- Peristalsis is absent in the distal two-thirds
- Mild dilation of the distal esophagus
- LES becomes incompetent
- Associated
  - Aspiration pneumonia
  - Reflux esophagitis with Barrett's esophagus



Esophageal Strictures

- Loss of lumen area
  - Normal 20 mm in diameter
- Dysphagia main symptom
  - Less than 15 mm
- Worse with large food pieces such as meat and bread
- Acid/peptic stricture accounting for the majority of cases (60%–70%).

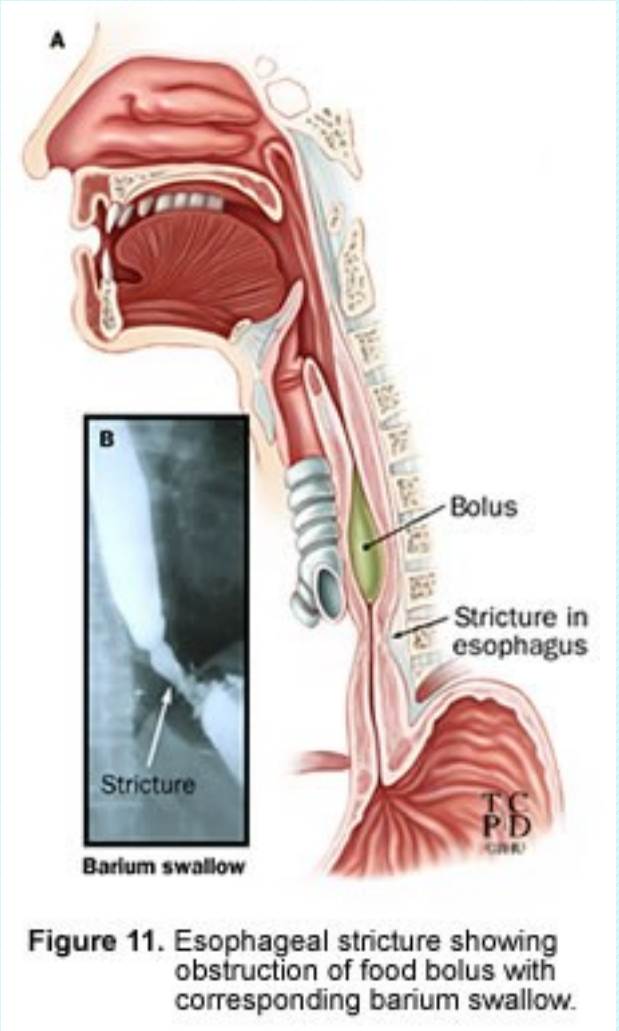


Figure 11. Esophageal stricture showing obstruction of food bolus with corresponding barium swallow.

Etiology of esophageal strictures

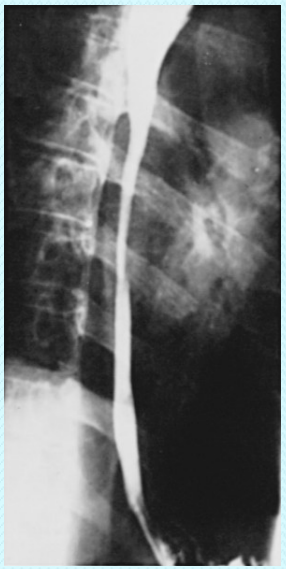
Intrinsic strictures
Acid peptic
Pill-induced
Chemical/lye
Post-nasogastric tube
Infectious esophagitis
Sclerotherapy
Radiation-induced
Esophageal/gastric malignancies
Surgical anastomotic
Congenital
Systemic inflammatory disease

Extrinsic strictures
Pulmonary/mediastinal malignancies
Anomalous vessels and aneurysms
Metastatic submucosal infiltration (breast cancer, mesothelioma, adenocarcinoma of gastric cardia)

Diagnosis

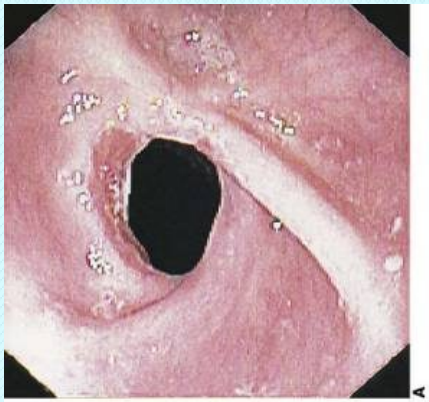
- Esophagogram
  - Initial diagnostic study
  - Delineate the stricture

Distal stricture

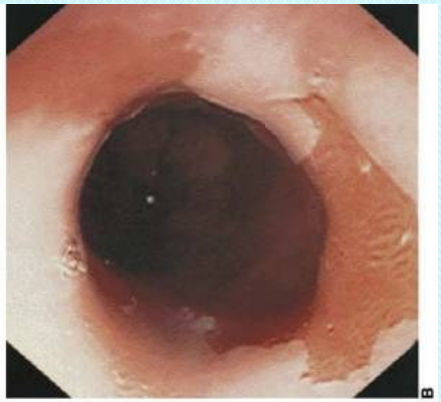


Caustic ingestion

- Endoscopy
  - Evaluate the mucosa



normal mucosa



Barrett's metaplasia

oesophageal stricture.

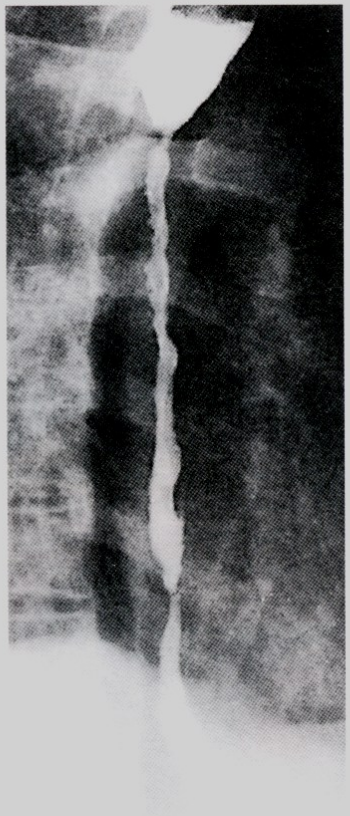


Fig. 50.23 Caustic or lye stricture with marked stenosis high in the body of the oesophagus. The strictures are frequently multiple and difficult to dilate unless treated energetically at an early stage.

Fig. 5.12 Corrosive stricture.

Treatment

- Esophageal dilation
  - Depends on the length and diameter
    - Tight or complex strictures
    - Less than 10 mm in diameter
    - Greater than 2 cm in length
    - Best managed with wire-guided bougies under fluoroscopic and endoscopic control
  - Done progressively over weeks to months with a gradual increase in the diameters of the dilators
  - Most patients have relief of dysphagia after dilation to a diameter of 40 to 54 French with no requirement for maintenance dilations
  - Radiation-induced or malignant strictures are at higher risk of perforation

Esophageal Rings & Webs

- Rings
  - Circumferential
  - Mucosa or muscle
  - Most commonly occur in the distal esophagus
  - Schatzki's ring occurs at the GEJ
- Webs
  - Only part of the esophageal lumen
  - Always mucosal
  - Located in the proximal esophagus
  - Association with iron deficiency (Plummer and Vinson)
- Symptoms
  - Intermittent solid food **dysphagia**, aspiration, and regurgitation

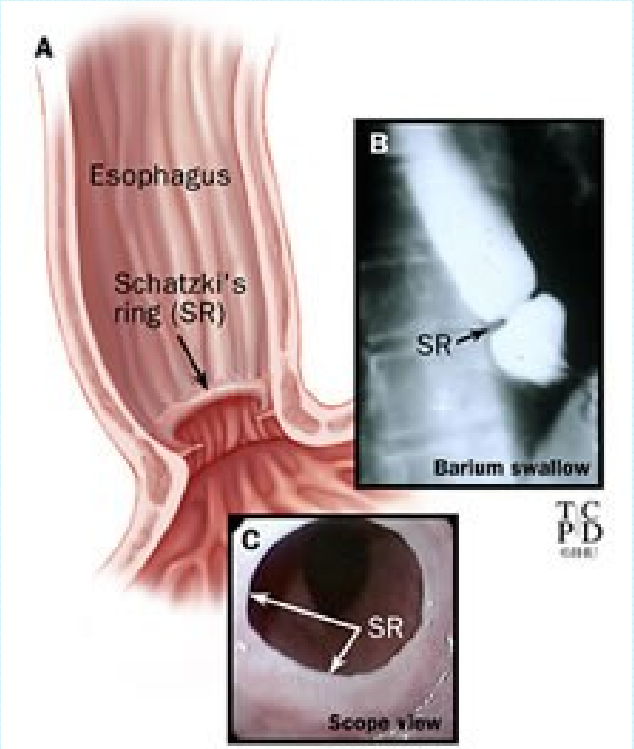


Figure 19. Schatzki's ring (**A**) with corresponding barium swallow x-ray (**B**) and endoscopic view (**C**)

- Barium Esophagogram
  - Most sensitive test
- Endoscopic visualization
  - Normal-appearing mucosa
  - Cervical webs are associated with carcinoma
- Treatment
  - Endoscopic dilation
  - Large bougie or balloon (15 to 20 mm) so as to fracture the ring
  - Refractory rings
    - Pneumatic dilation (large balloon)
    - Electrosurgical incision
    - Surgical resection
    - Treat GERD

Dysphagia lusoria

- Aberrant right subclavian artery
  - Arises from the left side of the aortic arch
  - Compress the posterior esophagus
  - 20% of cases anterior
- Diagnosis
  - Barium esophagogram
    - Indentation at the level of the third and fourth thoracic vertebrae
  - Confirmation
    - CT, MRI, arteriography, or EUS
  - Endoscopy
    - Right radial pulse may diminish with compression of the right subclavian artery
  - Esophageal manometry
    - High-pressure zone at the location of the aberrant artery
- Treatment
  - Symptoms usually respond to changes in diet to soft consistency and small size
  - When necessary, surgery relieves the obstruction by reanastomosing the aberrant artery to the ascending aorta

Fig. 50.15 Aberrant right subclavian artery causing oesopha
constriction. The words dysphagia lusoria are derived from the Latin
naturae, meaning sport of nature.

Gastroesophageal Reflux Disease

- GERD is recognized in about 10-15% of the population
- *Reflux esophagitis*
  - Changes in the esophageal mucosa
  - Present in 30% to 40%
- Barrett's esophagus
  - 10% to 20%
- Defects in the esophagogastric barrier such as
  - LES incompetence
  - Transient relaxation of LES
  - Hiatal hernia

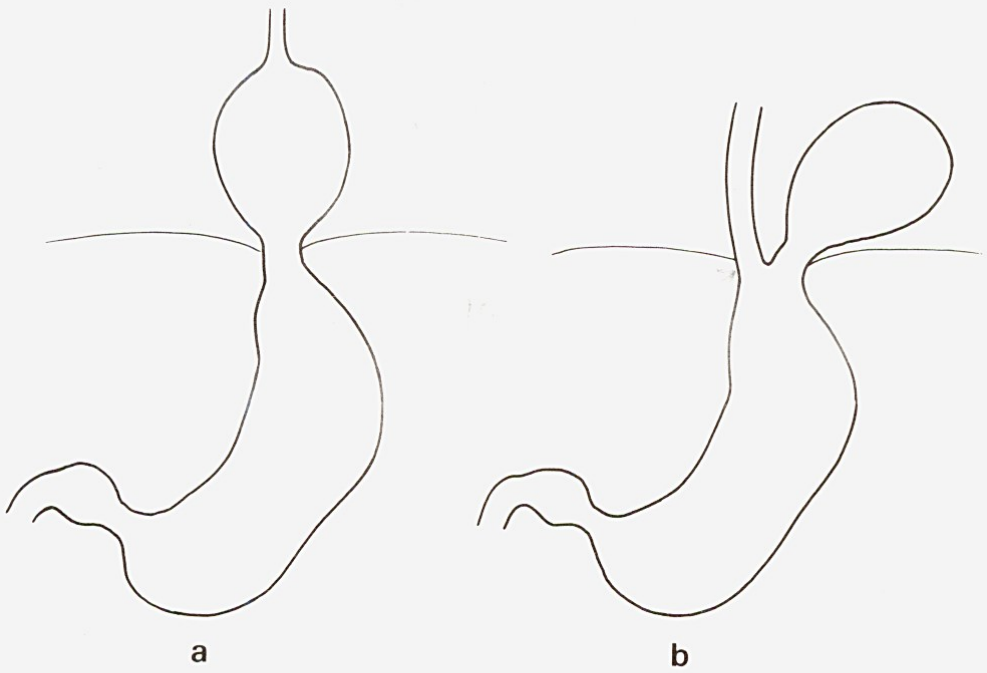
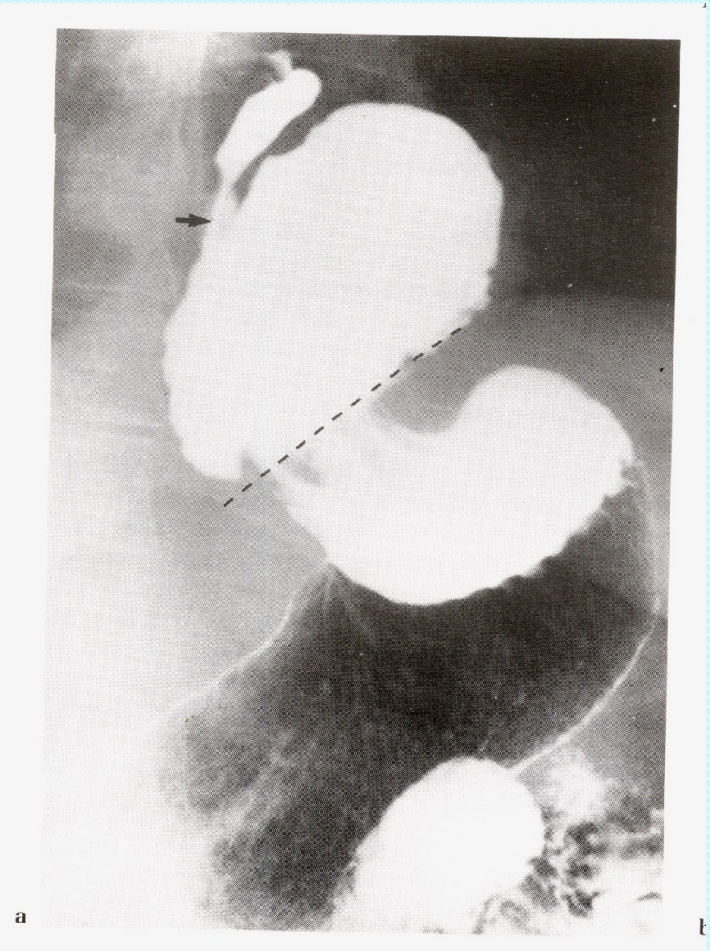
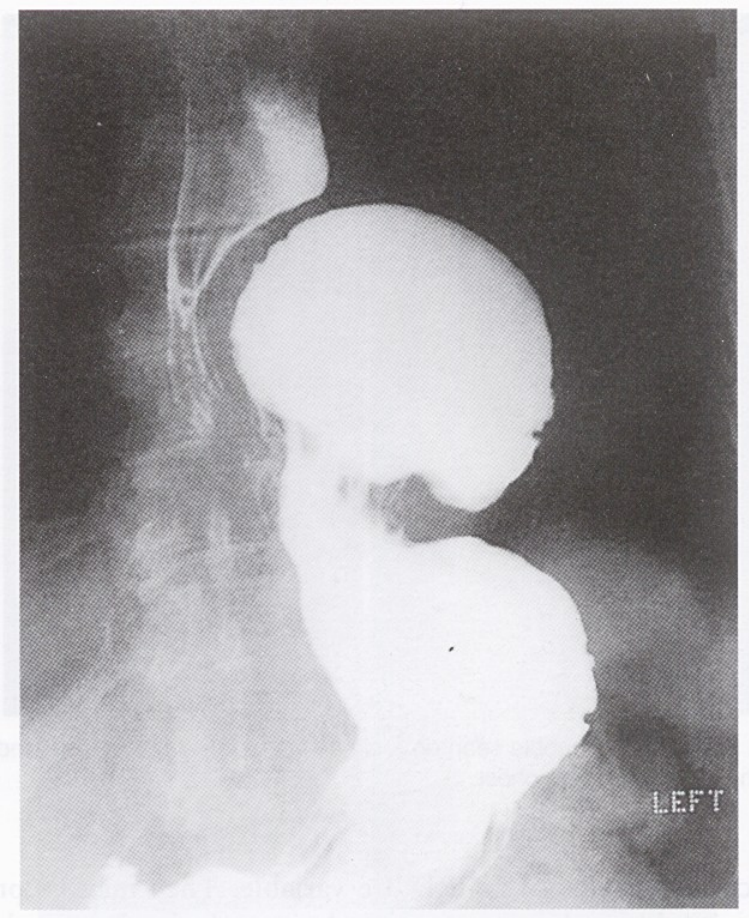


Fig. 5.33 Hiatus hernia. (a) Sliding: a portion of the stomach and the gastro-oesophageal junction are situated above the diaphragm; (b) rolling or para-oesophageal: the gastro-oesophageal junction is below the diaphragm.

Sliding Hernia



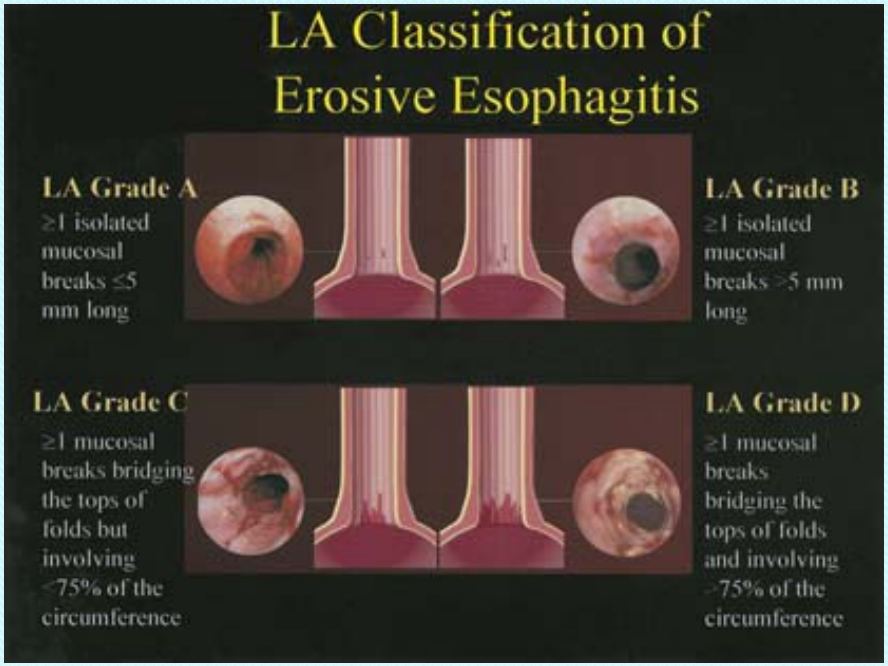
Paraesophageal Hernia



- Classic symptom is heartburn
  - Retrosternal burning discomfort and acid regurgitation
  - Other symptoms are dysphagia, odynophagia, and belching
- Laryngopharyngeal reflux (LPR)
  - Hoarseness, dysphagia, increased phlegm and globus sensation

- Treatment
  - Initial empiric trial in the absence of alarm signs
- Diagnostic testing
  - if there is a failure to respond to antisecretory therapy
  - if alarm signs such as dysphagia, odynophagia, weight loss, chest pain, or choking are present.

- Endoscopy
  - Reflux esophagitis
    - Erosions or ulcerations
  - pH probe results are normal in 25% of patients with erosive esophagitis

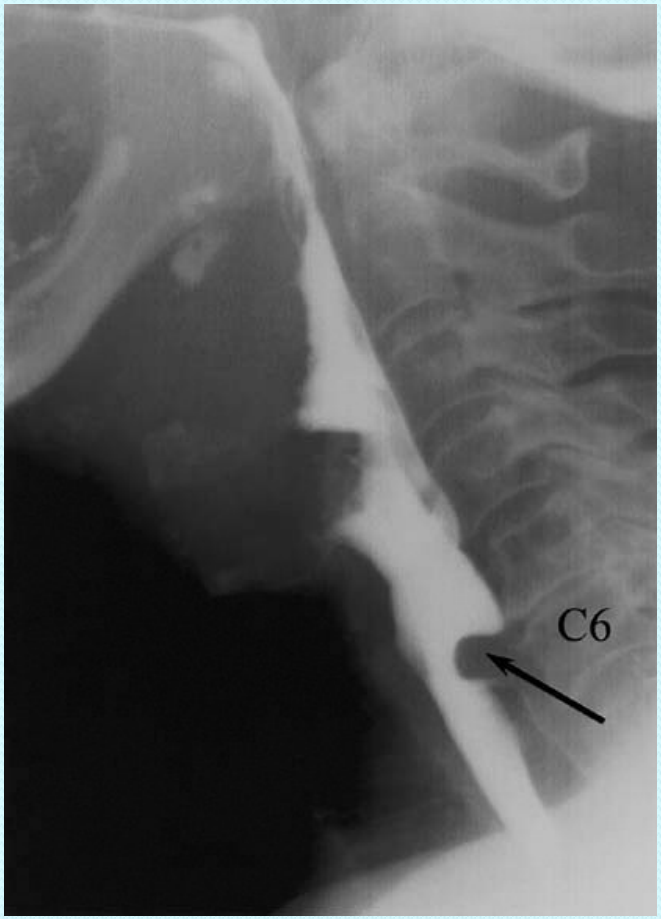


Barrett's esophagus

- Potentially serious complication of long-standing GERD
- Stratified squamous epithelium of the distal esophagus is replaced by intestinal columnar metaplasia
- Predisposes patients to the development of esophageal adenocarcinoma.

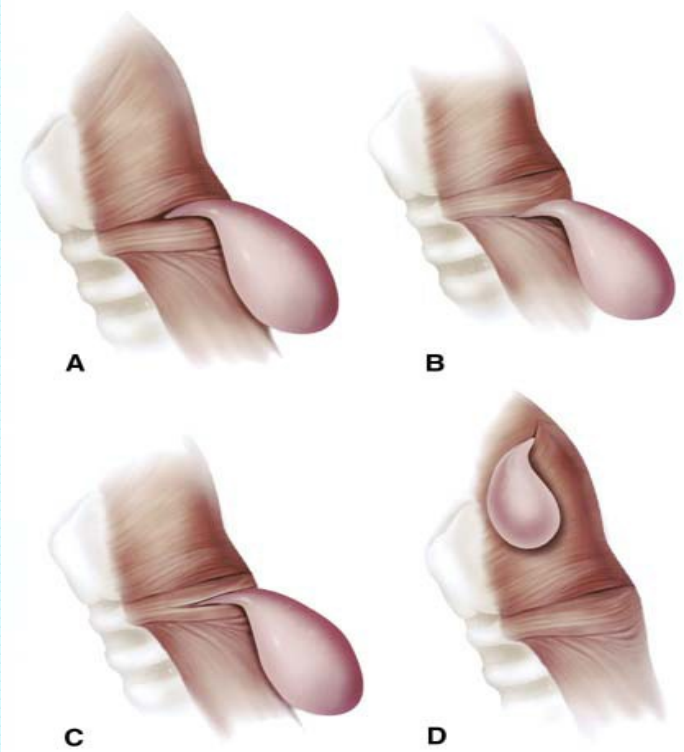
Cricopharyngeal Dysfunction

- The cricopharyngeus remains contracted between swallows
- **Cricopharyngeal achalasia**
  - Muscle fails to completely relax
  - smooth posterior impression on the hypopharynx



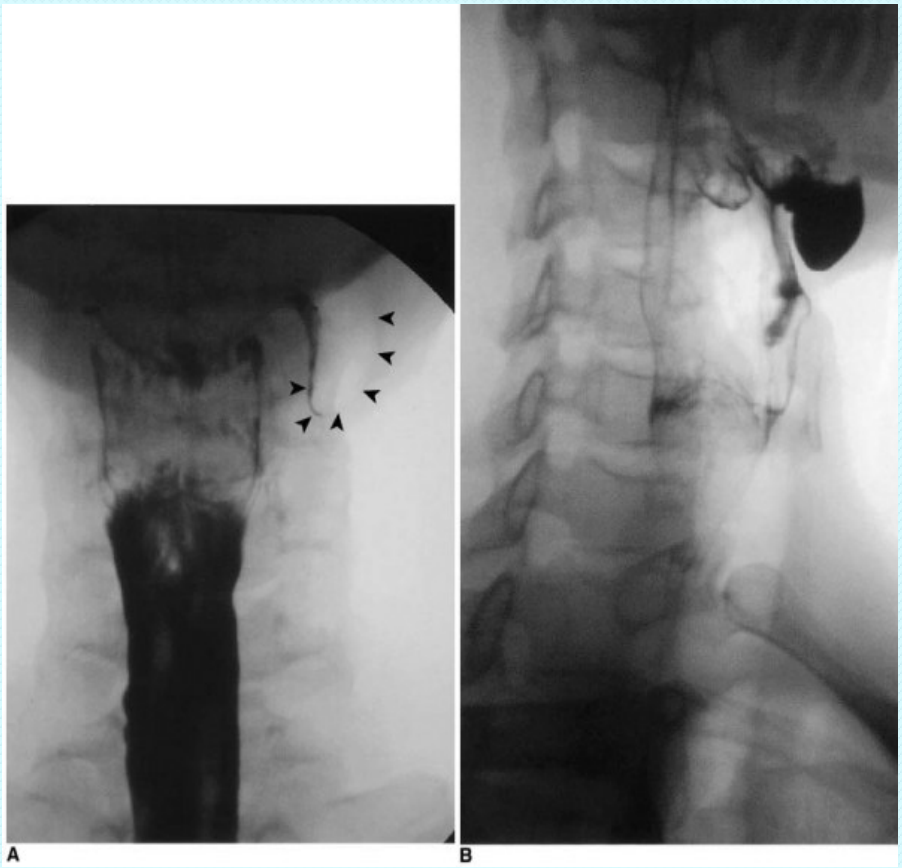
Zenker's Diverticulum

- Pulsion type diverticulum
  - Herniation of esophageal mucosa and submucosa through an area of weakened esophageal musculature



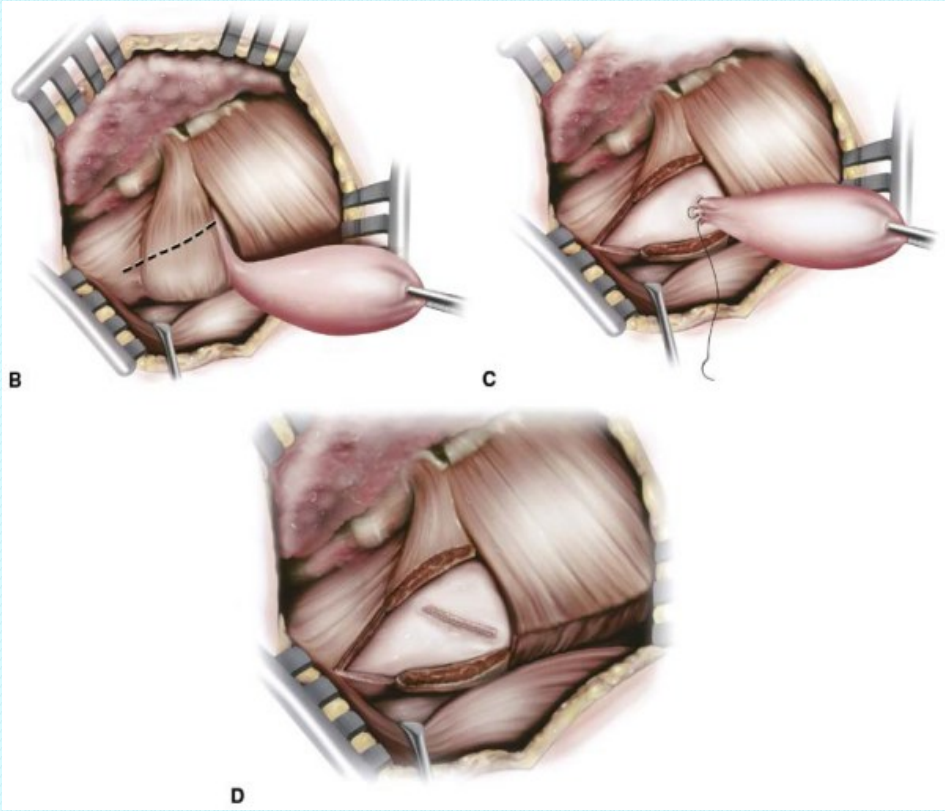
- History
  - Progressive dysphagia
  - Regurgitation of food
  - Unprovoked aspiration
  - Noisy deglutition

- Barium Esophagogram

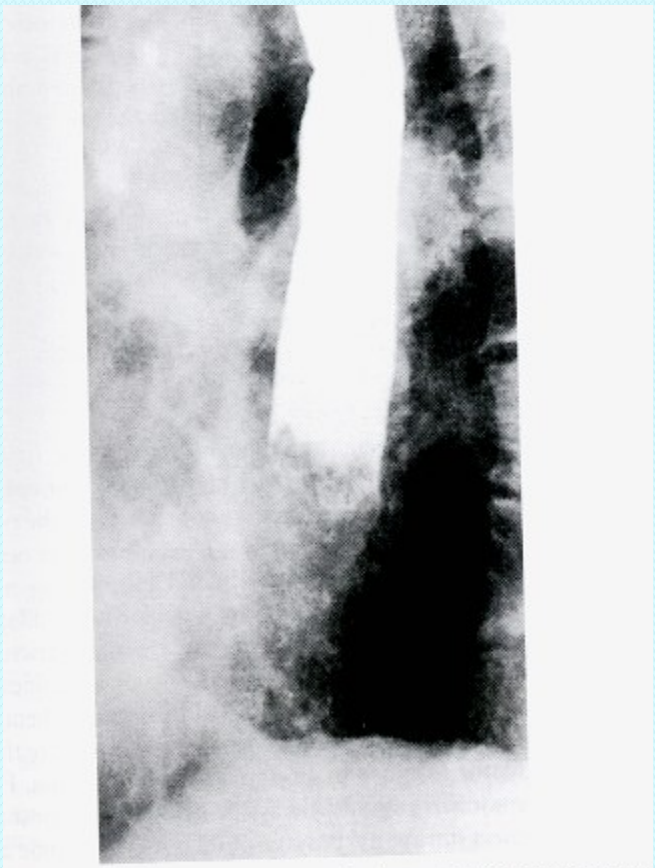


Treatment

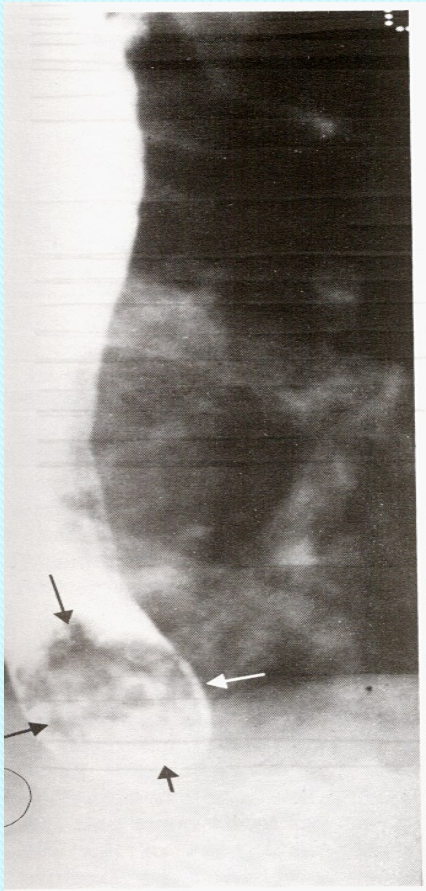
- Surgery
  - Cricopharyngeal myotomy
  - Diverticulum is excised and the defect closed



Impacted bolus



g. 50.16 An impacted meat bolus at the lower end of the oesophagus
is may be the first presentation of a benign stricture or a malignan
mour.



Impacted food. A piece of meat is lodged at the
l of the oesophagus and appears as a filling defect
surrounded by barium.

Leiomyoma

Fig. 50.45 Classic appearance of a benign leiomyoma on barium swallow.

6 Intraluminal polyp which proved to be a leiomyosarcoma.

Carcinoma of Esophagus

ETIOLOGY

- Exact cause is unknown.
- Associated factors are:
  - Tobacco use
  - Excessive alcohol ingestion
  - Nitrosamines
  - Poor dental hygiene
  - Hot beverages
  - Fungal contamination of food with the production of a carcinogenic mycotoxin.

- Predisposing conditions
  - High risk
    - Tylosis type A (palmaris & plantaris)
    - Plummer –Vinson synd.
  - Intermediate risk
    - Reflux disease & Barrett’ s esophagus
    - Achalasia
  - Low risk
    - Esophageal diverticula
    - Corrosive stricture
    - scleroderma

PATHOLOGY

- ***Site***
  - **Upper-third of esophagus Ô 4 %.**
  - **Middle-third of esophagus Ô 12.5 %.**
  - **Lower-third of esophagus Ô 46 %.**
  - **Esophagogastric junction Ô 37.5 %.**
- ***Macroscopic types***
  - **Annular stenosing lesion, usually found at cardia.**
  - **Epitheliomatous ulcer with raised everted edges.**
  - **Fungating cauliflower-like friable mass.**
- ***Microscopic types***
  - **Adenocarcinoma (60-75%).**
  - **Squamous-cell carcinoma, is the 2nd commonest type.**
  - **Oat cell cancer (occasionally).**

- ***Spread***
  - ***Direct spread***
    - **Occur in both transverse & longitudinal directions, & erodes the muscular wall to invade important structures of neck & posterior mediastinum, as well as the left main bronchus & trachea.**
  - ***Lymphatic spread***
    - **From cervical esophagus Ô Supraclavicular lymph nodes**
    - **From thoracic esophagus Ô Paraesophageal & tracheo-bronchial lymph nodes, with downward extension to subdiaphragmatic nodes.**
    - **From abdominal esophagus Ô Lymph nodes along lesser curvature of stomach, & then to celiac nodes.**
  - ***Bloodstream spread***
    - **Mainly to liver & lungs.**

CLINICAL FEATURES

- **Dysphagia Ô Steadily progressive.**
- **Regurgitation Ô Regurgitated material is alkaline, mixed with saliva, & often streaked with blood.**
- **Anorexia.**
- **Pain.**
- **Weight loss.**
- **Hoarseness (due to recurrent laryngeal nerve palsy).**
- **Cervical lymphadenopathy.**

INVESTIGATIONS

- ***Radiography with Barium swallow***
  - **Demonstrates location & extent of tumor.**
- ***Esophagoscopy***
  - **Demonstrates macroscopic types, location & extent of tumor.**
  - **biopsy can be taken for histologic examination.**
- ***Bronchoscopy***
  - **In upper- or middle-third growth, trachea or left main bronchus may be involved, & a broncho-esophageal fistula may develop.**
- ***Exfoliative cytology***
  - **May led to discovery of an early carcinoma, when radiology & esophagoscopy have been negative.**
- ***Ultrasound***
  - **Per abdominal Ô For the detection of secondary liver deposits.**
  - **Endoscopic Ô Best method for preoperative staging of esophageal cancer.**

- ***CT scanning***
  - **Performed from suprasternal notch to umbilicus Ô To assess tumor in regard to its length & breadth, & to detect metastasis in mediastinal nodes, lung fields, liver, & celiac nodes.**
- ***Laparoscopy***
  - **It is useful for assessing adenocarcinoma of the distal esophagus esp. if it extends below the phreno-esophageal ligament.**
  - **It is useful for detecting transperitoneal spread & liver metastasis.**
- ***Routine laboratory tests for surgical fitness***
  - **Blood C/P, ESR**
  - **Hemoglobin percentage**
  - **Liver function tests**
  - **Blood electrolytes**
  - **Blood & urine sugar**
  - **Urine D/R**

Fig. 50.48 Squamous cell carcinoma of the oesophagus producing an irregular stricture with shouldered margins.

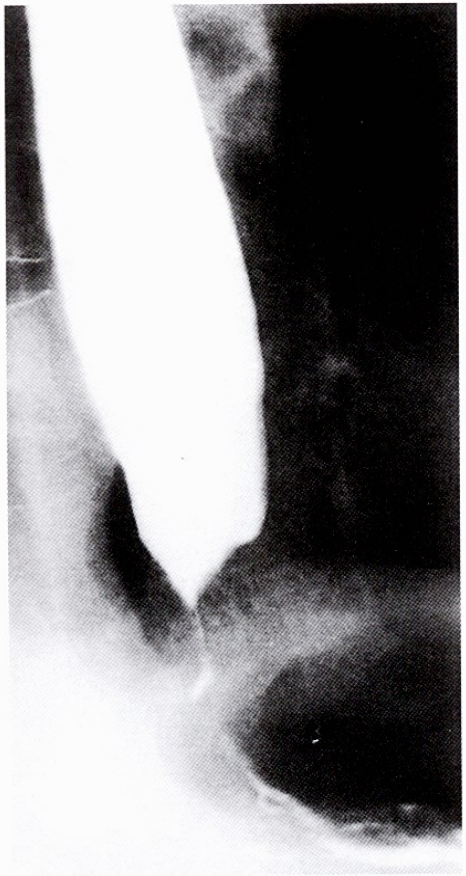


Fig. 50.63 Almost achalasia, but note the irregularity of the taper which indicates carcinoma of the cardia.

noma. There is an irregular stricture with row) at the upper end.

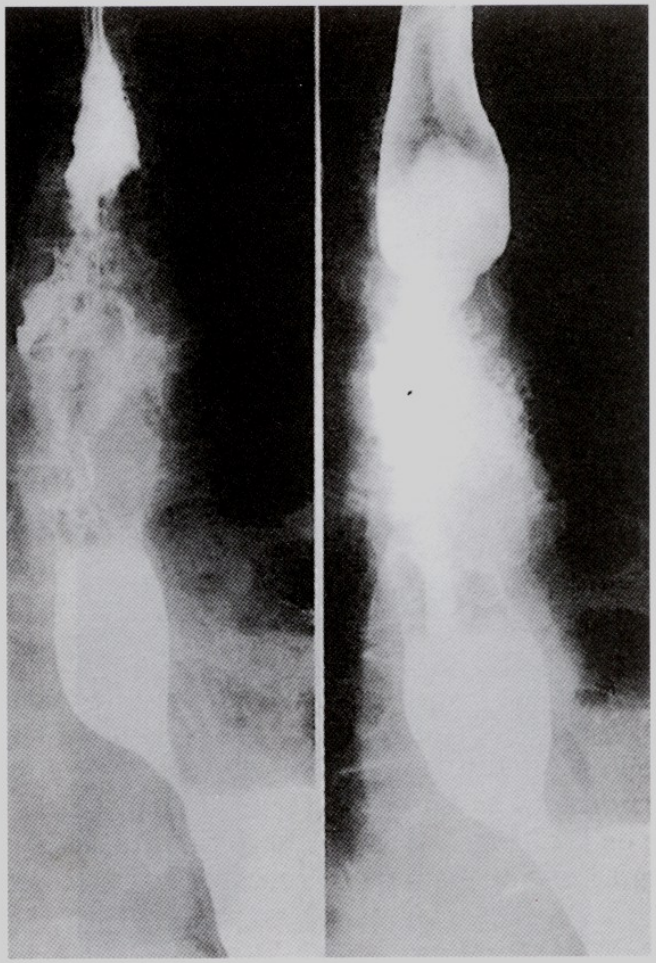


Fig. 50.47 The classic appearances of a mid-oesophageal proliferative squamous cell carcinoma.

Cancer Staging

- Staging is described by the TNM system:
  - the size and location of the Tumor,
  - whether cancer has spread to nearby lymph Nodes, and
  - whether the cancer has Metastasized (spread to other areas of the body)

Primary Tumor (T)

T_X Primary tumor cannot be assessed (cytologically positive tumor not evident endoscopically or radiographically)
T_0 No evidence of primary tumor (e.g., after treatment with radiation and chemotherapy)
T_{is} Carcinoma *in situ*
T_1 Tumor invades lamina propria or submucosa, but not beyond it
T_2 Tumor invades muscularis propria
T_3 Tumor invades adventitia
T_4 Tumor invades adjacent structures (e.g., aorta, tracheobronchial tree, vertebral bodies, pericardium)

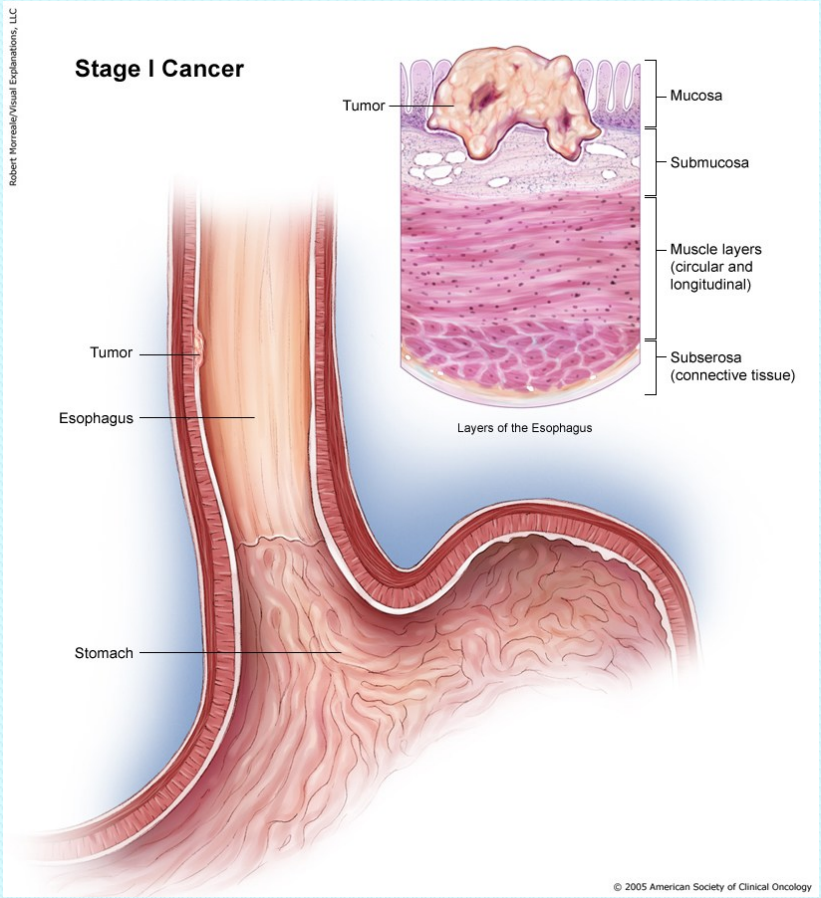
Regional Lymph Nodes (N)

N_X Regional nodes cannot be assessed
N_0 No regional node metastasis
N_1 Regional node metastasis

Distant Metastasis (M)

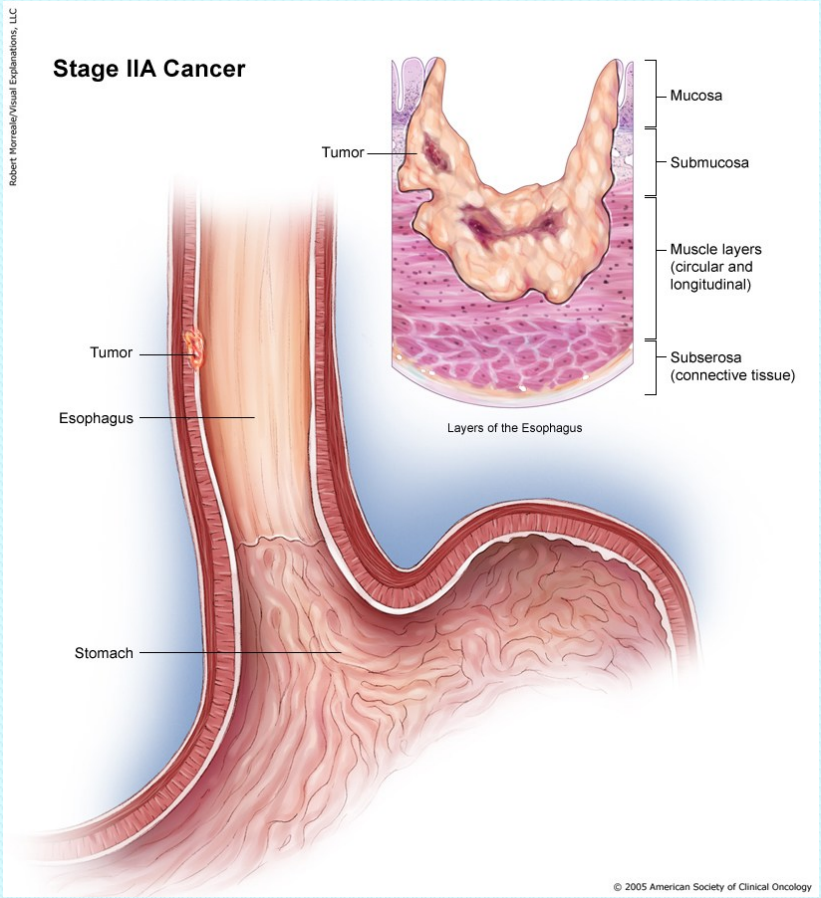
M_X Presence of distant metastasis cannot be assessed
M_0 No distant metastasis
M_1 Distant metastasis

Stage I Esophageal Cancer



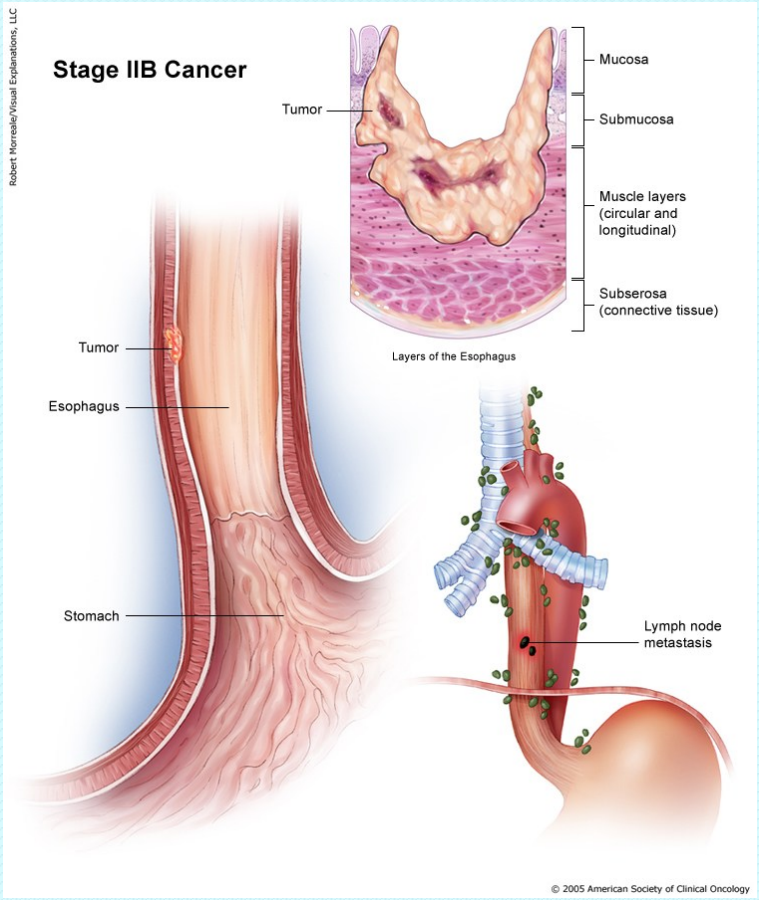
- Cancer is in the lamina propria and submucosa (the two inside layers of the esophagus)

Stage IIA Esophageal Cancer



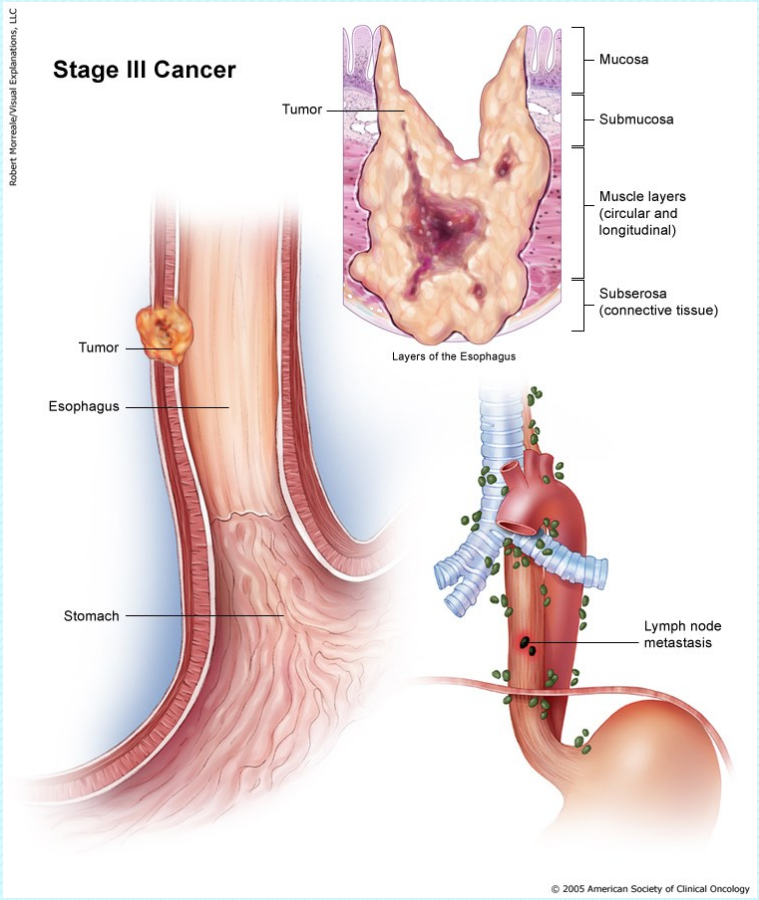
- Cancer is in either of the two outer layers of the esophagus

Stage IIB Esophageal Cancer



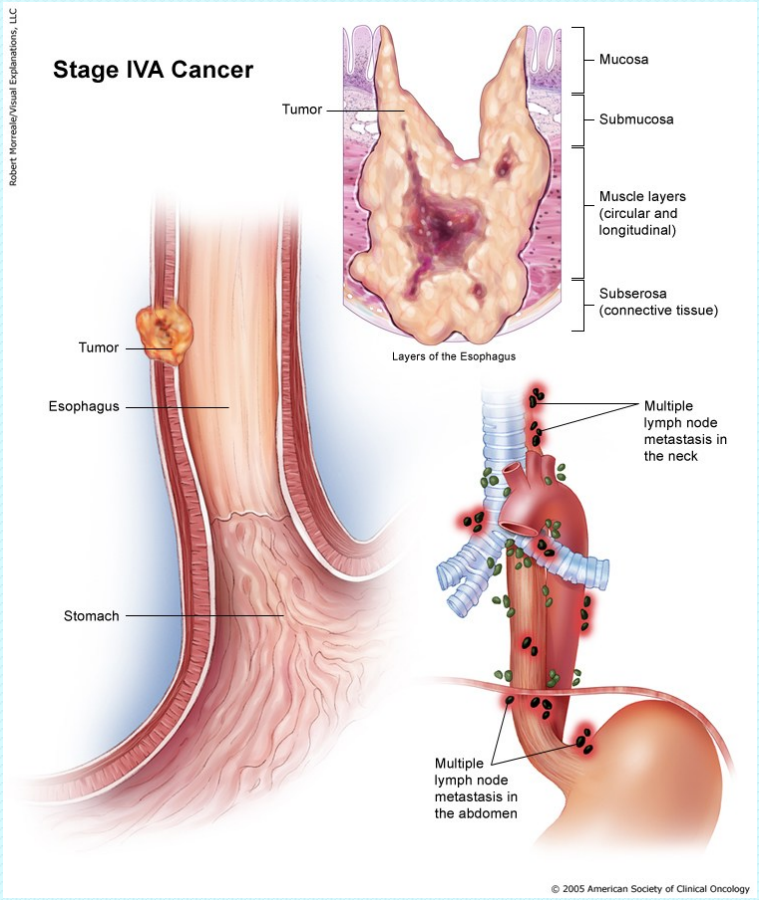
- Cancer is in the outer layers
- Cancer has spread to some lymph nodes near the tumor

Stage III Esophageal Cancer



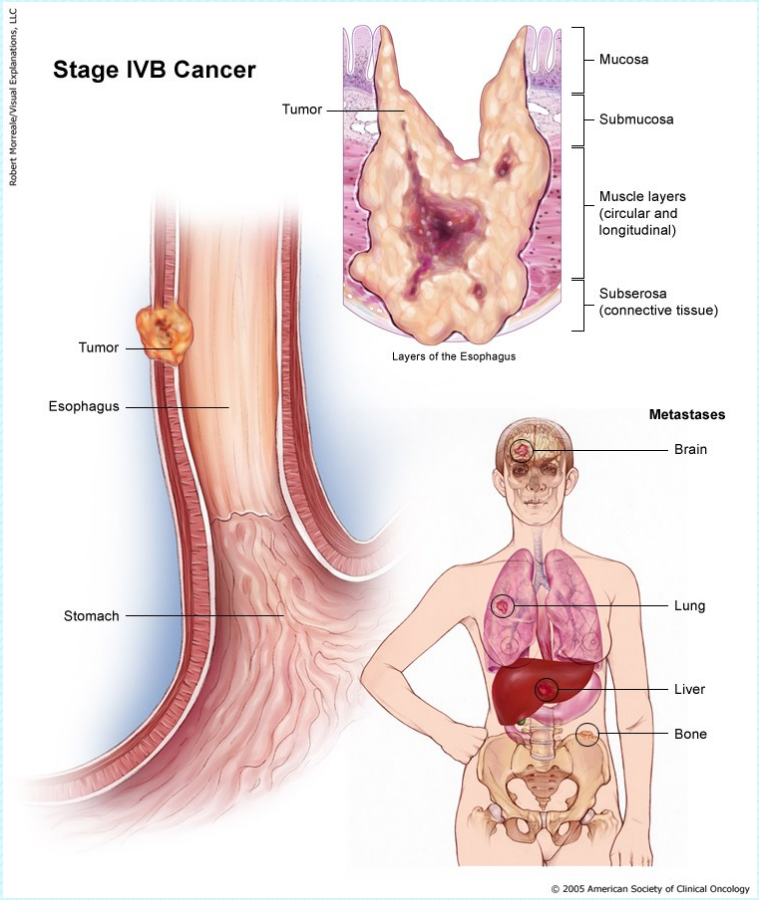
- Cancer is in the outside layer of the esophagus or in the tissue near the esophagus
- Cancer has spread to lymph nodes, either near the tumor or somewhere else in the body

Stage IVA Esophageal Cancer



- Cancer has spread to the lymph nodes in the abdomen or neck

Stage IVB Esophageal Cancer



- Cancer has spread to other parts of the body besides the lymph nodes

TREATMENT

- Curative surgical treatment
- Radiotherapy
- Chemotherapy
- Palliative treatment

Curative Surgical Treatment

- **It involves resection of an appropriate length of esophagus together with any involved stomach &locoregional lymphatics;**
- **this is attempted providing, patient is fit enough to withstand surgery.**

- ***Subtotal esophagectomy***
  - ***Ivor Lewis (Lewis-Tanner) approach***
    - **It is used for carcinoma of middle or lower thirds.**
    - **It is carried out thru right 5th rib bed (right thoracotomy), preceded by a laparotomy to mobilize stomach & to confirm the absence of extensive abdominal metastases.**
    - **Via this approach access for anastomosis is not hampered by aortic arch.**
  - ***McKeown operation***
    - **It is used for carcinoma of upper third.**
    - **Inaddition to right thoracotomy & laparotomy, a third incision is made in the neck.**
    - **After excision of the growth, the continuity is restored by esophagogastric anastomosis or jejunal or colonic transposition brought up retrosternally or subcutaneously; esophagogastric anastomosis is safest when done in the anterior part of neck.**

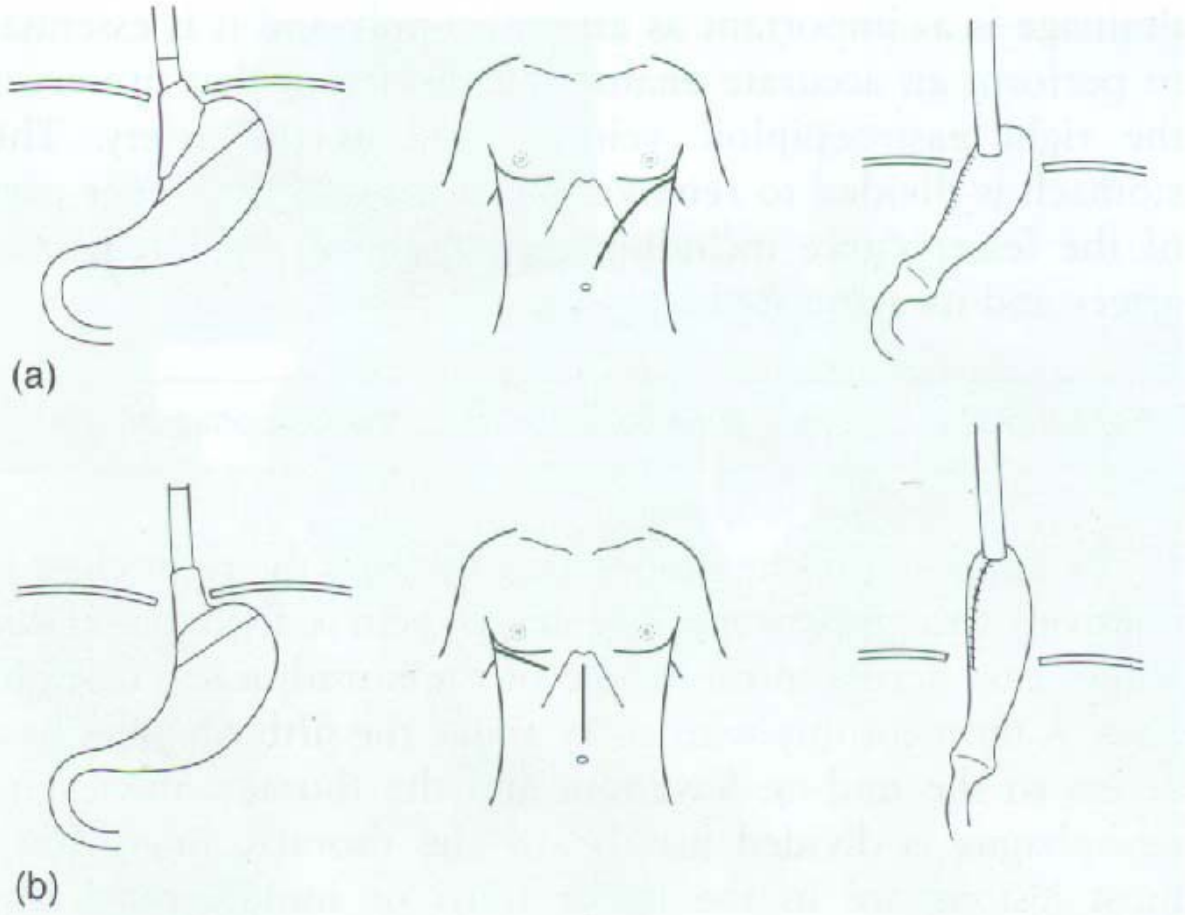


Fig. 50.56 The two usual approaches for surgery of the oesophagus are: (a) the thoracoabdominal which opens the abdominal and thoracic cavities together; and (b) the two-stage Ivor Lewis approach where the abdomen is opened first, closed and then the thoracotomy is performed. In the McKeown operation, a third incision in the neck is made to complete the cervical anastomosis.

- ***Transhiatal esophagectomy (without thoracotomy)***
  - **It is used for carcinoma of lower third.**
  - **Stomach is mobilized thru a laparotomy incision & the cervical esophagus is mobilized thru a neck incision.**
- ***Left thoracoabdominal approach***
  - **It is used for carcinoma of middle or lower third.**
  - **A long skin & muscle incision is made on the left side with entry into the chest above 7th rib & removal of a short segment of costal cartilage.**
- ***Thoracoscopic esophagectomy***
  - **Esophagectomy may be done by thoracoscopy or by video-assisted thoracic surgery (VATS) in which a combination of endoscopic & conventional instruments is used thru small thoracic incisions.**

Curative Radiotherapy

- **It is an useful alternative to surgery esp. in unfit patients.**
- **can produce long-term survival.**
- **traditionally used for squamous cell cancer**
- **it may also be effective for adenocarcinomas.**

Chemotherapy

- **Regimens containing cis-platinum, 5-fluorouracil & vinblastine can produce shrinkage of disease in up to 60 % of cases.**
- **Best responses are seen in squamous cell cancers.**

Palliative Treatment

- **Aim is to enable the patient to swallow.**
- **It is carried out, if growth is inoperable because of general condition of patient, or presence of metastases. Various alternatives are:**

- ***Intubation***
  - **Atkinson tube Ô Placed at endoscopy.**
  - **Celestin tube Ô Introduced by passing tail of tube thru stricture into stomach at esophagoscopy, & then making a small opening in stomach at laparotomy & pulling the tube down until its upper end sits snugly over tumor.**
  - **Souttar tube Ô Stricture is first dilated, & then Souttar tube is passed.**
  - **Procter-Livingstone tube.**
  - **Expanding metal stent may be inserted under X-ray or endoscopic control.**

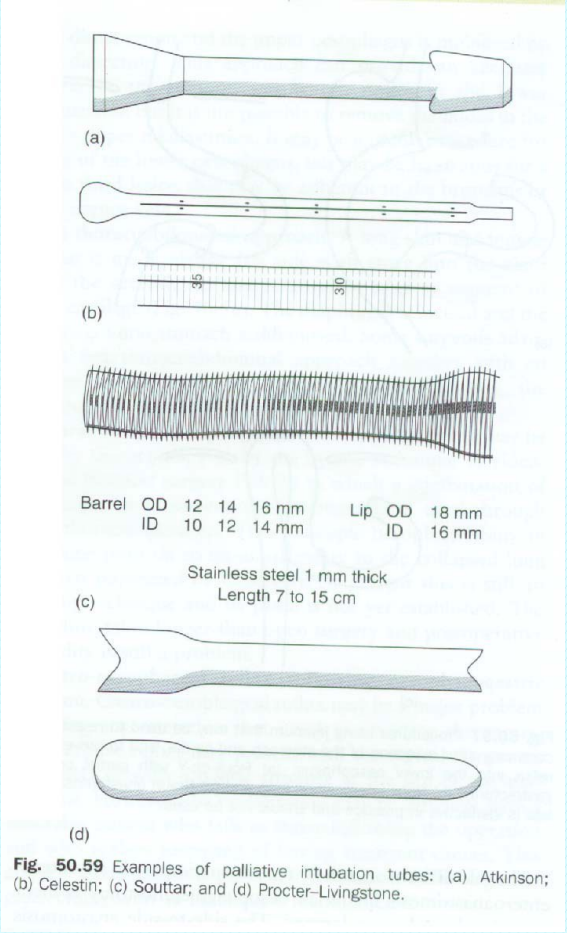


Fig. 50.59 Examples of palliative intubation tubes: (a) Atkinson; (b) Celestin; (c) Souttar; and (d) Procter–Livingstone.

Fig. 50.61 Tracheo-oesophageal fistula treated by intubation with a Souttar tube: (a) before; and (b) after.

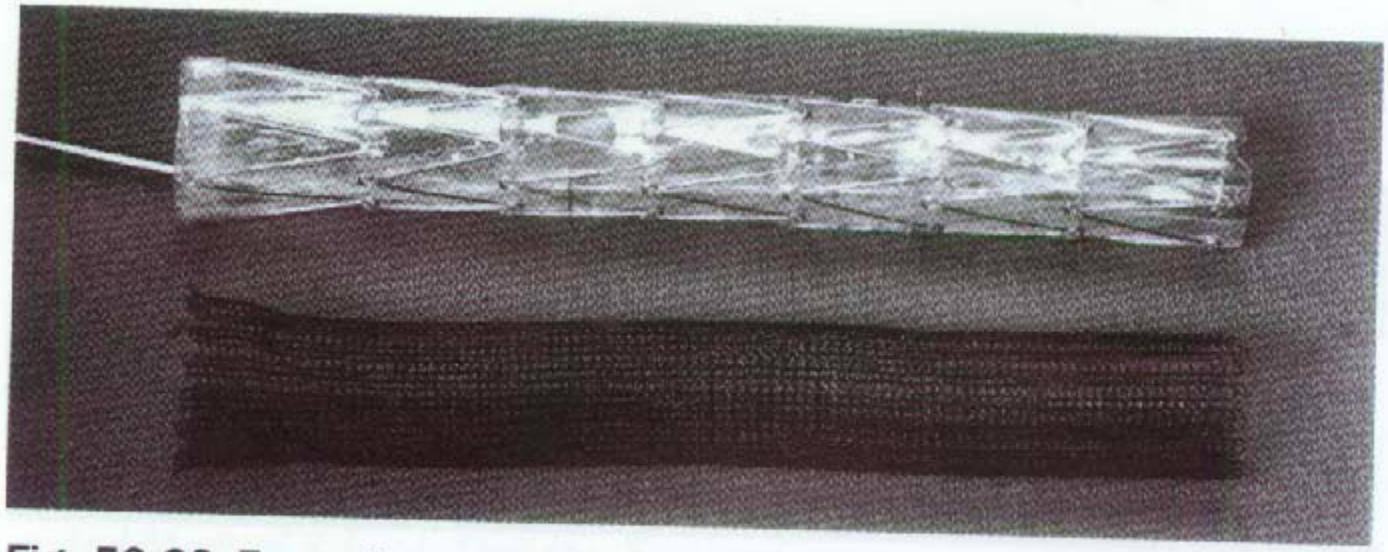


Fig. 50.60 Expanding metal stents – covered and uncovered.

- ***Palliative short circuit operation***
  - **Palliative esophago-gastrectomy.**
  - **Esophago-jejunostomy with a Roux-en-Y loop.**
- ***Brachytherapy***
  - **It is a method of delivering intraluminal radiation with a short penetration distance to a tumor.**
- ***Laser treatment***
  - **Endoscopic laser treatment may be used to core a channel thru the tumor.**
- ***Other methods of endoscopic palliation***
  - **Include bipolar diathermy, argon beam plasma coagulation & alcohol injection.**

TERMINAL COMPLICATIONS

- **Unresected, growth causes death in one of the following ways:**
  - **Progressive cachexia & dehydration.**
  - **Pneumonia from perforation into some part of bronchial tree.**
  - **Mediastinitis from perforation into posterior mediastinum.**
  - **Erosion of aorta.**

The End!