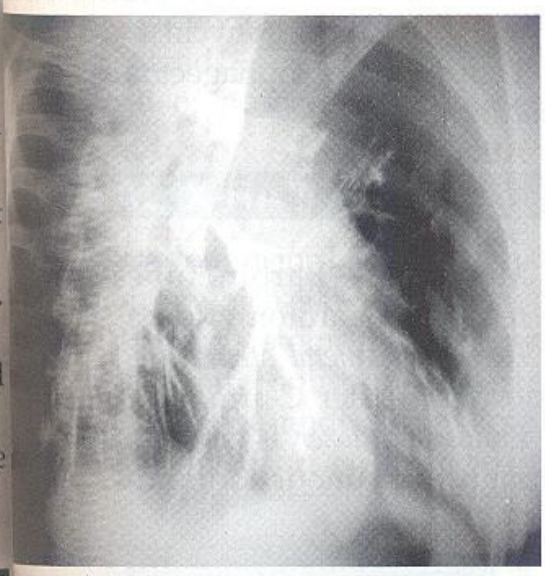
al scan to look for local extension and status tracheo bronchial tree in case of upper). id growth.
trasound abdomen to look for liver and mph nodes status in abdomen.
doscopic oesophageal staining with eled iodine results in normal mucosa being in ined brown, but remains pale in carcinoma. s mucosa involved with carcinoma will be take up iodine).



1.91: Contrast X-ray showing bronchooesophageal in a case of carcinoma oesophagus. Note the dye ng into the oesophagus. In broncho/tracheo ageal fistula water soluble nonionic agent (Dianosil) e.

tment
stomy should not be done as a palliative dure.

ve treatment:
ions:
ly growth, when patient is fit.
en there is no involvement of lymph nodes, nchus and liver.
st-cricoid tumour is treated mainly by diotherapy.
hen pharyngo-laryngectomy is done along th gastric or colonic transposition. *But mplications are more in this procedure.*
r-Lewis operation or Mc Keown operation lower third or middle third or upper third

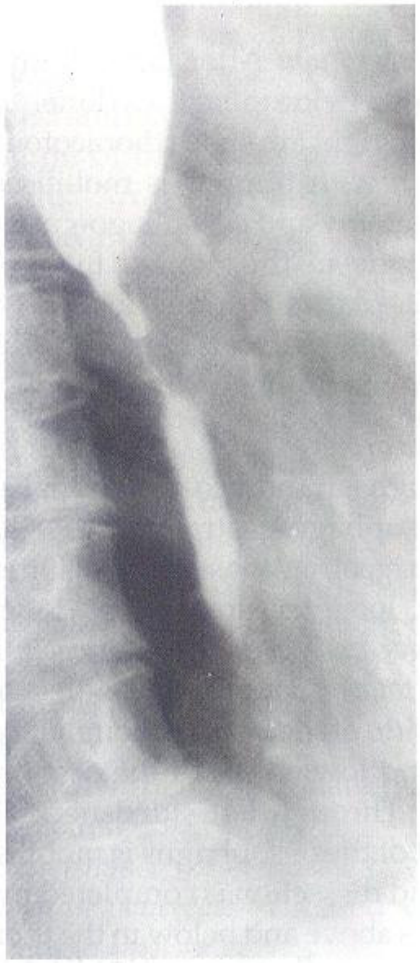


Fig. 4.92: Barium swallow X-ray showing rat tail lesion in the lower oesophagus near O-G junction with narrowing and irregularity – feature of carcinoma oesophagus.

growths (depending on locations) can be done.

Upper third growth:

- Treated mainly by radiotherapy.
- Commonly it is advanced with left recurrent nerve palsy and bronchial invasion.

If it is early and operable, Mc Keown three staged oesophagectomy and anastomosis is done in the neck. Initially laparotomy is done to mobilize the stomach. Then thoracotomy through right 5th space is done and oesophagus is mobilized. Through right side neck approach, oesophagus with growth is removed. Anastomosis between pharynx and stomach is done in the neck.

Malignant bronchooesophageal fistula is common in upper third growths.

Middle third growth:

Ivor Lewis operation: After laparotomy stomach is mobilised. Pyloroplasty is done.

Through right 5th space thoracotomy is done and growth with tumour is mobilised. Partial oesophagectomy and oesophago-gastric anastomosis is done in the thorax. Intercostal tube drainage is placed during closure.

If growth is inoperable, Palliative radiotherapy or chemotherapy is given.

Lower third growth:

Here through left thoraco-abdominal approach, partial oesophago-gastrectomy is done with oesophago gastric anastomosis. Often jejunal Roux-en-Y loop anastomosis is done.

Orrhinger and Orrhinger approach, i.e. *Trans hiatal blind total oesophagectomy* with anastomosis in the left side of the neck. Through laparotomy, stomach and lower part of the oesophagus are mobilised. Through left sided neck approach, upper part of the oesophagus is mobilised using finger. Blind dissection is completed by meeting both fingers above and below in the thorax. Later oesophagus is pulled up out above through the neck wound and removed. Continuity is maintained in the neck. It is a *palliative* surgery.

Thoracoscopic—Laparoscopic oesophagectomy is practised in a few centers. It is popular and better. Total oesophagectomy with three field nodal dissection (celiac/thoracic/neck nodes) is also done as a radical procedure. When interposition is required, mobilised *stomach or jejunum or colon (left)* are used. Commonly it is placed in the thorax. Often it can be placed in substernal space or in front of the sternum in subcutaneous plane (especially colon). Stomach is commonly used to pull up as it has got good vascularity; and it is technically easier to mobilise and pull up for adequate length.

Palliative Treatment

Indications for palliative therapy

- Relieve pain.
- Relieve dyspahgia.
- Prevent bleeding.
- Prevent aspiration.

Palliative procedures

- External or intra luminal radiotherapy
- *Traction tubes* like Celestin or MB tubes through open surgery.
- *Pulsion tubes* like self-expandable metal stents through endoscopes using C arm.
- Endoscopic Laser.
- Chemotherapy – Cis platin, bleomycin, methotrexate, mitonycin and 5 fluorouracil.
- Transhiatal oesophagectomy.

Intubation:

Atkinson tube.
Celestin tube.
Souttar tube.
Mousseau—Barbin tube—cheaper, requires laparotomy to pass.

Expanding metal stents are passed through endoscope under C-arm guidance.

Endoscopic laser is used to core a channel through the tumour to improve dysphagia.

Complications of oesophagectomy

- 5-10% mortality.
- Haemorrhage.
- Respiratory infection, often severe.
- Septicaemia.
- Chylothorax, injury to thoracic duct.
- Anastomotic leak—thoracic leak is more dangerous.
- Hoarseness due to recurrent laryngeal nerve palsy.
- Stricture formation.

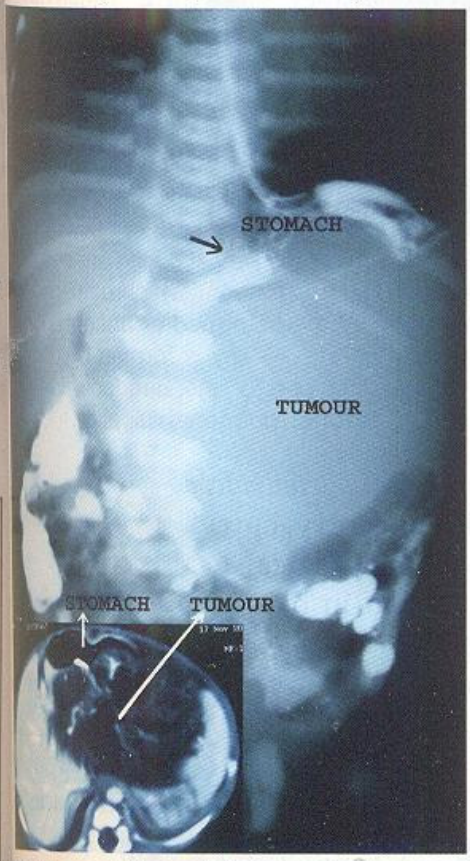
Terminal events in carcinoma oesophagus

- Cancer cachexia
- Sepsis
- Immunosuppression
- Malignant tracheo-oesophageal fistula (causes severe respiratory infection and death. Here expansile *endoluminal stents* are used at the site of fistula to have temporary benefit).

TNM staging for carcinoma oesophagus?
primary tumour.
rcinomas *in situ*.
mour involving submucosa.
mour involving muscularis propria.
mour with peri-oesophageal spread.
olvement of recurrent laryngeal nerve, renic nerve, sympathetic chain, azygos n and adjacent structures.
lymph nodes.
bile regional nodes.
distant spread.
stant spread or positive celiac nodes.

UM MEAL X-RAY

meal X-ray is done using barium sulphate (w/v) solution of which 400-600 ml is givor It is done on empty stomach. Microcrys- barium sulphate solution is better. ure should be done under fluoroscopic ce. Buscopan injection is given to the



Barium meal X-ray showing extrinsic compression ch by gastric teratoma in a newborn child. Inset CT picture of the tumour of the same child.

patient to delay the gastric emptying. Glucagon also can be used. Effervescent tablet (calcium carbonate and antifoaming agent) is given to the patient. 200 ml of barium sulphate solution is given to drink. X-rays are taken to get *double contrast* barium meal X-rays.

Indications for barium meal X-ray

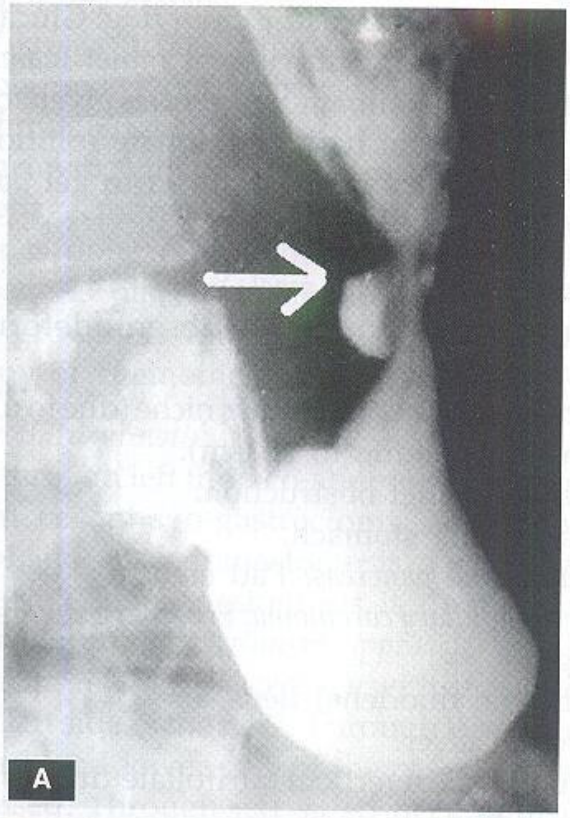
- *Duodenal ulcer:* Shows absent/deformed duodenal cap.
- *Benign gastric ulcer:* Shows niche (due to ulcer) and notch (due to spasm).
- Gastric outlet obstruction.
- Carcinoma stomach.
- *Carcinoma pancreas:* Pad sign.
- *Periampullary carcinoma:* Frostberg reverse '3' sign.
- Chronic duodenal ileus.
- Stomal ulcer.
- Duodenal diverticula: trifoliate duodenum.
- Trichobezoars.
- Gastric fistulas.
- *Pseudocyst of pancreas:* Widened vertebro – gastric angle.

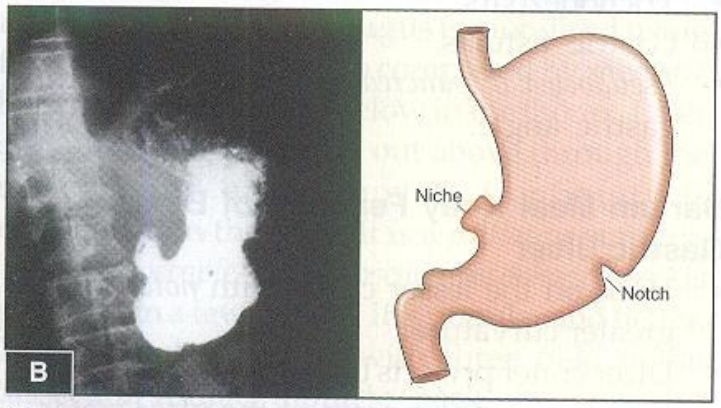
Barium Meal X-ray Features of Benign Gastric Ulcer

- *Niche* on the lesser curve with *notch* on the greater curvature.
- Ulcer crater projects beyond the lumen of the
- Regular/round margin of the ulcer crater – *stomach spoke wheel pattern.*
- Overhanging mucosa at the margins of a benign gastric ulcer – projects inwards towards the ulcer – *Hamptom's line.*
- Converging mucosal folds towards the base of the ulcer.
- Symmetrical normal gastric mucosal folds.

Features of chronic benign gastric ulcer

- It may be due to atrophic gastritis, smoking, alcohol.
- Typical pain which is more after taking food and is relieved by inducing vomiting.
- Periodicity, haematemesis are other features.
- Complications are – hour glass contracture, tea-pot deformity, erosion into left gastric/





Figs 4.94A and B: Barium meal X-ray showing niche and notch in gastric ulcer. Benign gastric ulcer is usually in lesser curve where there will be niche. Notch occurs on the diagonally opposite side of the ulcer due to spasm of circular muscle fibre.

splenic arteries, perforation and malignant transformation. Risk of carcinoma is 6-23%.

- Patients with gastric ulcer treated with anti ulcer drugs like proton pump inhibitor will become symptomatically better but ulcer heals partially and retains its potentiality transform into carcinoma stomach.
- Giant gastric ulcer is benign gastric ulcer *than 3 cm in size.*
- Benign ulcer occurs usually in the lesser cu whereas ulcer in greater curve is commo malignant.

Treatment for chronic benign gastric ul is partial gastrectomy with Billroth I gast duodenal anastomosis.

Barium Meal X-ray in Duodenal Ulcer

Absence of duodenal cap or deformed first part the duodenum is the classical feature of chron duodenal ulcer. It is due to spasm of the part of the duodenum causing its deformi Chronic duodenal ulcer can lead into second diverticulum leading into *trifoliate* duodenu

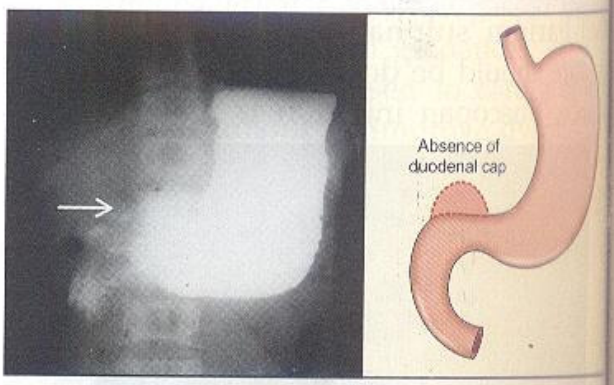


Fig. 4.95: Barium meal X-ray showing absence of duodena cap without any obstruction. In chronic duodenal ulce duodenal cap may be deformed or absent. Duodenal cap in normal barium meal X-ray is formed by pouching effec of the normal first part of the duodenum. It is lost due to spasm in chronic duodenal ulcer.

Features of duodenal ulcer

- 'Hurry, worry, curry': stress, anxiety are the basic aetiological factors.
- Common in blood group O positive.
- *Helicobacter pylori* infection is seen in more than 90% of duodenal ulcer. Other causes

Types of gastric ulcer (Johnson)		
Type I: In the antrum near the lesser curve	55%	Normal acid level
Type II: Proximal gastric ulcer with duodenal ulcer	25%	High acid level
Type III: Pre-pyloric ulcer	15%	High acid level
Type IV: Gastric ulcer in the proximal stomach or cardia	05%	Normal acid level