Basic Principle for Surgical Treatment of Esophageal Cancer

부산대학교병원 조정수

contents

- Surgical indication and guideline
- Operative method and technical principle

Operative Indication

- Complete resection(R0) is ultimate goal of esophagectomy for cancer

- Positive nodal disease is not necessarily a contraindication for surgery if the metastatic LNs arte deemed resectable and within the region of the primary tumor

- In case of cN+ and /or cT3-4(transmural tumor extension), multimodality treatment plan including induction chemo±radiotherapy is commonly used in most centers today.

8th Edition Sheilds' General thoracic surgery

Absolute contraindication for esophagectomy

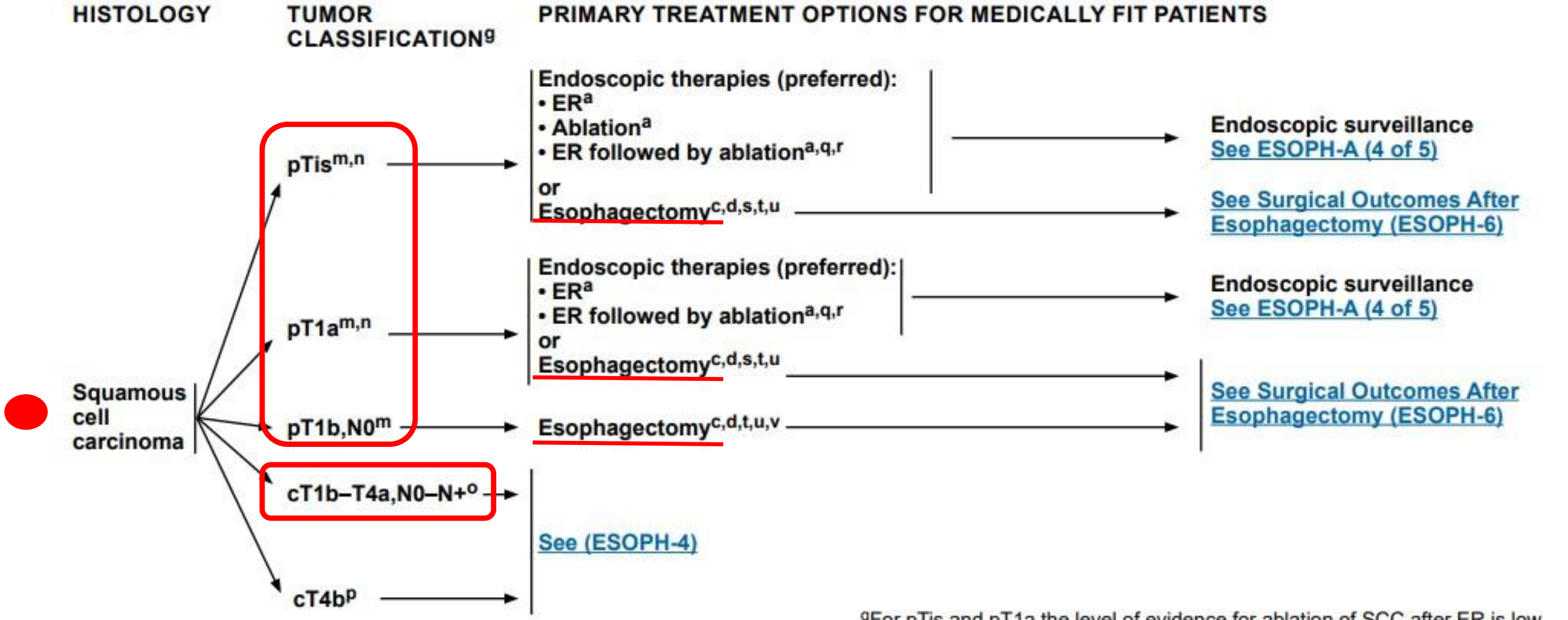
- Local tumor invasion of non-resectable neighboring structures(T4b)
- Carcinomatosis peritonei
- Hematogenous metastases involving solid organs
- Non-resectable LN metastases

8th Edition Sheilds' General thoracic surgery

National Comprehensive Cancer Network®

NCCN Guidelines Version 1.2020
Esophageal and Esophagogastric Junction Cancers

NCCN Guidelines Index
Table of Contents
Discussion



[q]For pTis and pT1a the level of evidence for ablation of SCC after ER is low. However, additional ablation may be needed if there is multifocal high-grade

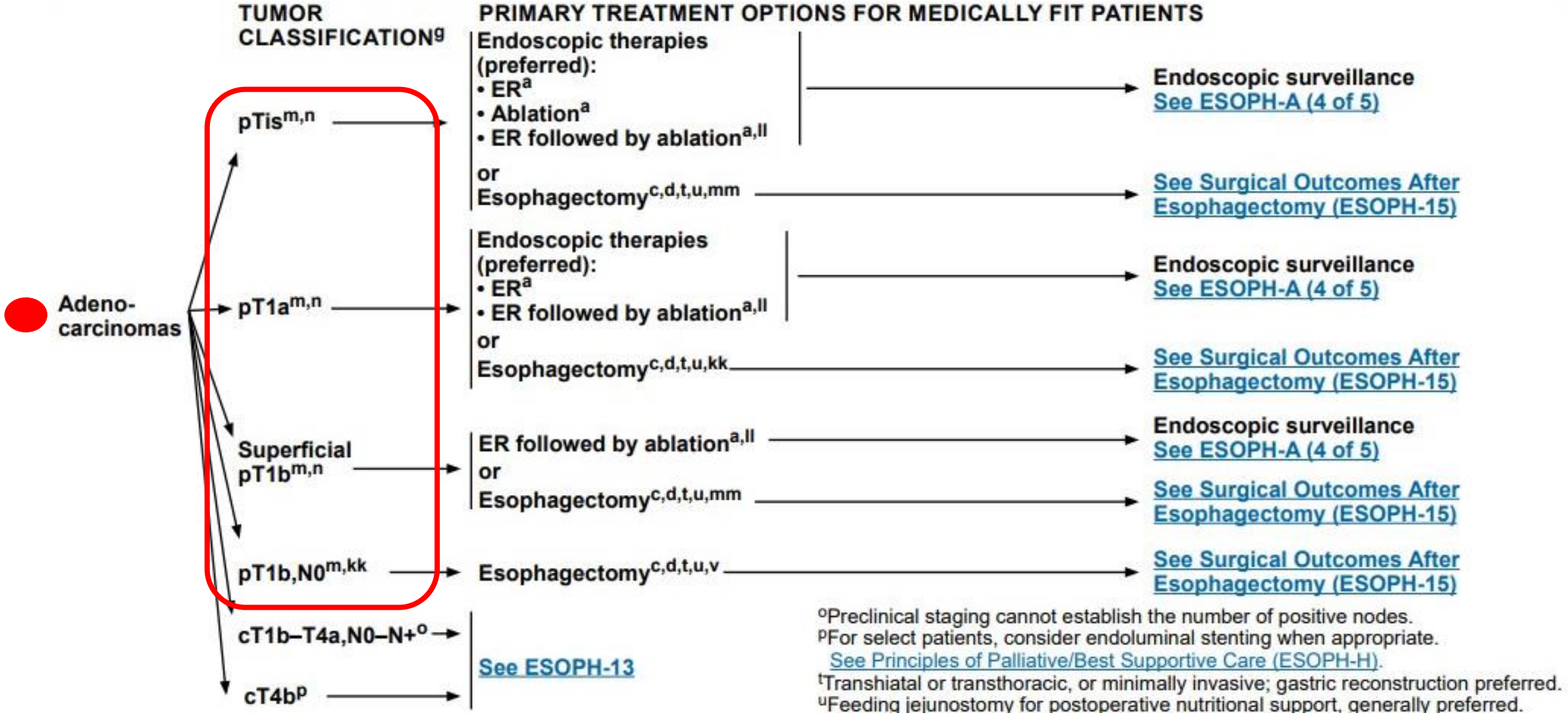
National Comprehensive Cancer Network®

NCCN Guidelines Version 1.2020
Esophageal and Esophagogastric Junction Cancers

NCCN Guidelines Index
Table of Contents
Discussion

HISTOLOGY	TUMOR CLASSIFICATION[g]	PRIMARY TREATMENT OPTIONS FOR MEDICALLY FIT PATIENTS	
Squamous cell carcinoma	cT1b–cT2,N0 (low-risk lesions: <3 cm, well differentiated)[o]	Esophagectomy[c,d,t,u] (for non-cervical esophagus)	See Surgical Outcomes After Esophagectomy (ESOPH-6)
	cT2, N0 (high-risk lesions: LVI, ≥3 cm, poorly differentiated) cT1b–cT2, N+ or cT3–cT4a, Any N[w]	Preoperative chemoradiation[x,y] (for non-cervical esophagus) (RT + concurrent chemotherapy) or Definitive chemoradiation[x,y] (for cervical esophagus) (RT + concurrent chemotherapy)	See Response Assessment (ESOPH-5) Follow-up (See ESOPH-9)
	cT4b[p]	Definitive chemoradiation[x,y] (RT + concurrent chemotherapy) Consider chemotherapy alone in the setting of invasion of trachea, great vessels, or heart[x] See Palliative Management (ESOPH-10)	See Response Assessment (ESOPH-5)

NCCN Guidelines Version 1.2020
Esophageal and Esophagogastric Junction Cancers



[o]Preclinical staging cannot establish the number of positive nodes.
[p]For select patients, consider endoluminal stenting when appropriate. See Principles of Palliative/Best Supportive Care (ESOPH-H).
[t]Transhiatal or transthoracic, or minimally invasive; gastric reconstruction preferred.
[u]Feeding jejunostomy for postoperative nutritional support, generally preferred.

National Comprehensive Cancer Network®

NCCN Guidelines Version 1.2020
Esophageal and Esophagogastric Junction Cancers

NCCN Guidelines Index
Table of Contents
Discussion

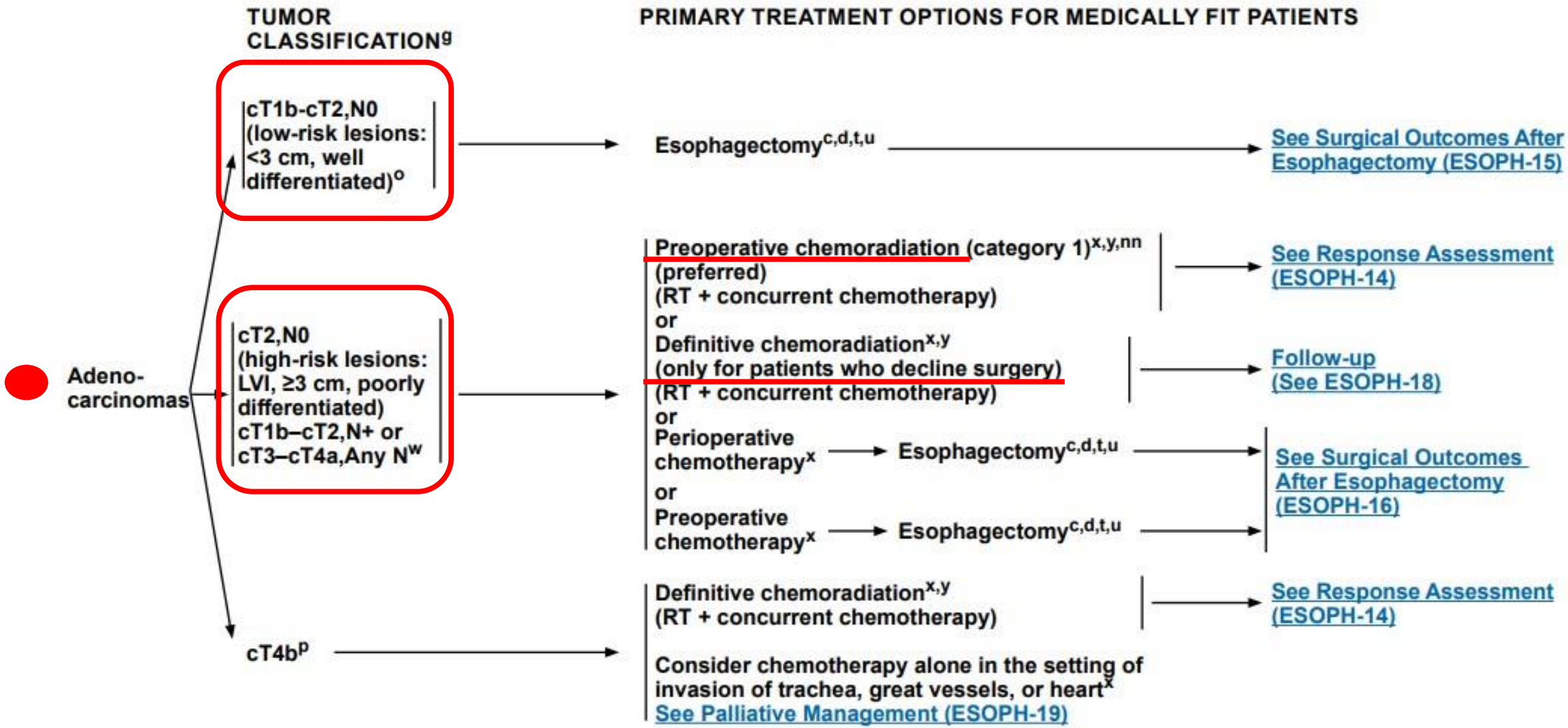


Table 1. **Definitions for T, N, M**

T	Primary Tumor
TX	Primary tumor cannot be assessed
T0	No evidence of primary tumor
Tis	High-grade dysplasia, defined as malignant cells confined to the epithelium by the basement membrane
T1	Tumor invades the lamina propria, muscularis mucosae, or submucosa
T1a	Tumor invades the lamina propria or muscularis mucosae
T1b	Tumor invades the submucosa
T2	Tumor invades the muscularis propria
T3	Tumor invades adventitia
T4	Tumor invades adjacent structures
T4a	Tumor invades the pleura, pericardium, azygos vein, diaphragm, or peritoneum
T4b	Tumor invades other adjacent structures, such as the aorta, vertebral body, or airway

N	Regional Lymph Nodes
NX	Regional lymph nodes cannot be assessed
N0	No regional lymph node metastasis
N1	Metastasis in one or two regional lymph nodes
N2	Metastasis in three to six regional lymph nodes
N3	Metastasis in seven or more regional lymph nodes

M	Distant Metastasis
M0	No distant metastasis
M1	Distant metastasis

G	Histologic Grade
GX	Grade cannot be assessed
G1	Well differentiated
G2	Moderately differentiated
G3	Poorly differentiated, undifferentiated

Squamous Cell Carcinoma

Location	Location Criteria
X	Location unknown
Upper	Cervical esophagus to lower border of azygos vein
Middle	Lower border of azygos vein to lower border of inferior pulmonary vein
Lower	Lower border of inferior pulmonary vein to stomach, including gastroesophageal junction

Note: Location is defined by the position of the epicenter of the tumor in the esophagus.

Operative method and technical principle

- Extent of operation
  - Standard resection
  - En bloc resection
- Acceptable LN dissection
  - In patients undergoing esophagectomy without induction chemoradiation, at least 15 LNs should be removed and assessed to achieve adequate nodal staging
  - After induction chemoradiation, optimal number of dissected LNs is unknown, although similar LN resection is recommended

8th Edition Sheilds' General thoracic surgery

Operative method and technical principle

- **Standard resection**
  - periesophageal tissue
- **En bloc resection**
  - Extensive en bloc resection
  - Radical en bloc resection
    - En bloc resection with extensive lymphadenectomy
    - Two field and three field LN dissection

Operative methods and technical principles

- Operative approaches
  - Transthoracic esophagectomy
  - Transhiatal esophagectomy
  - Minimally invasive esophagectomy

Alternative Conduits for Replacement of the Esophagus

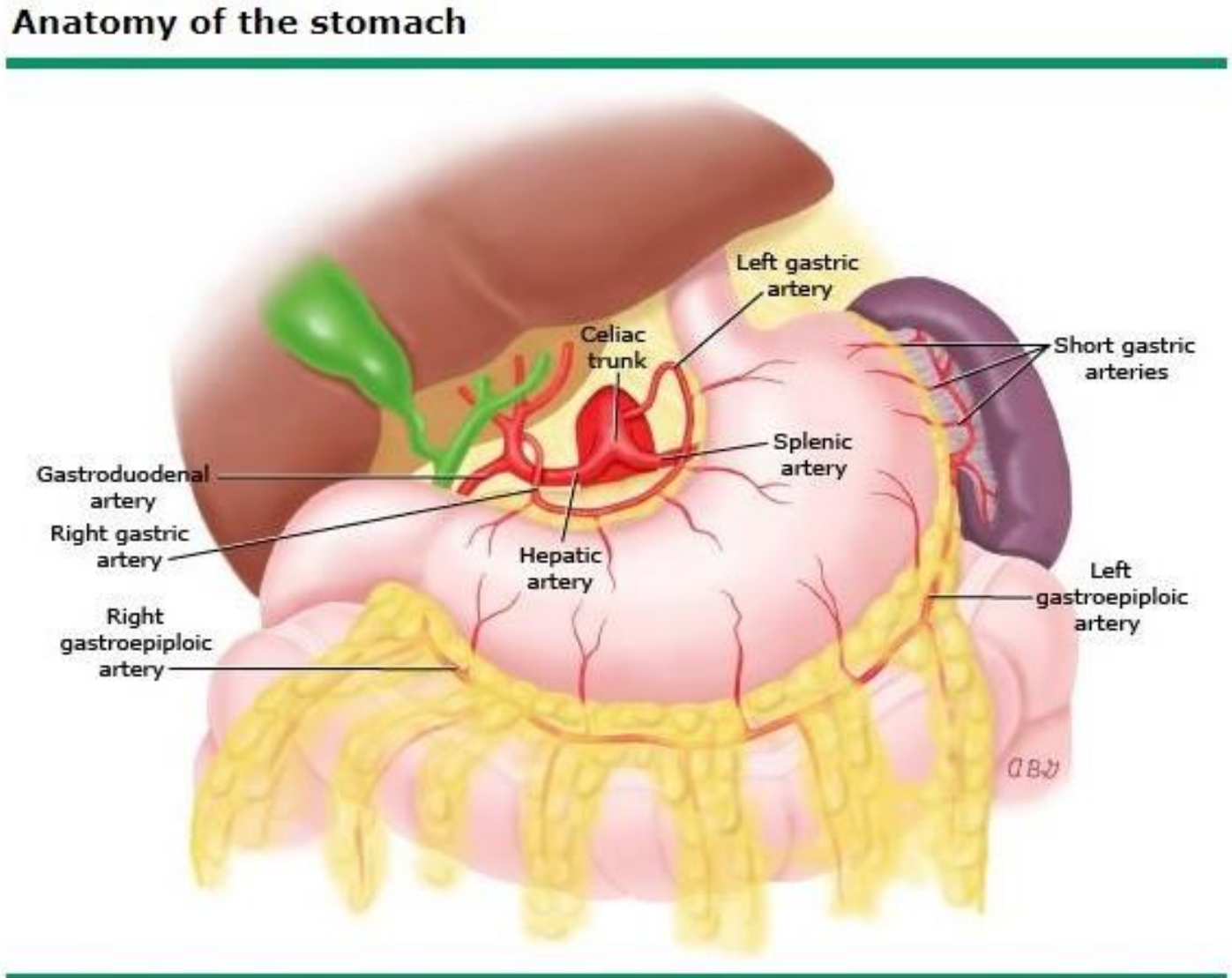
- Gastric (preferred)
- Colon
- Jejunum

Gastric conduit

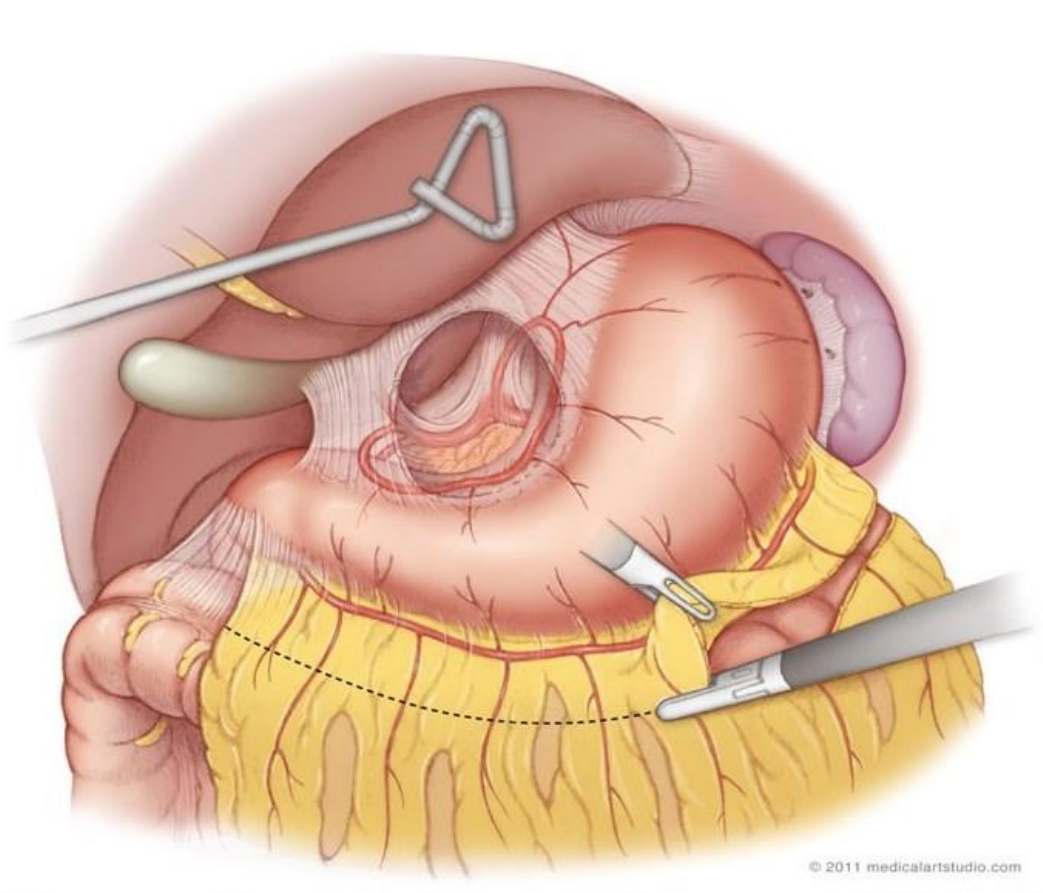
- Gastric mobilization with/without tubulization

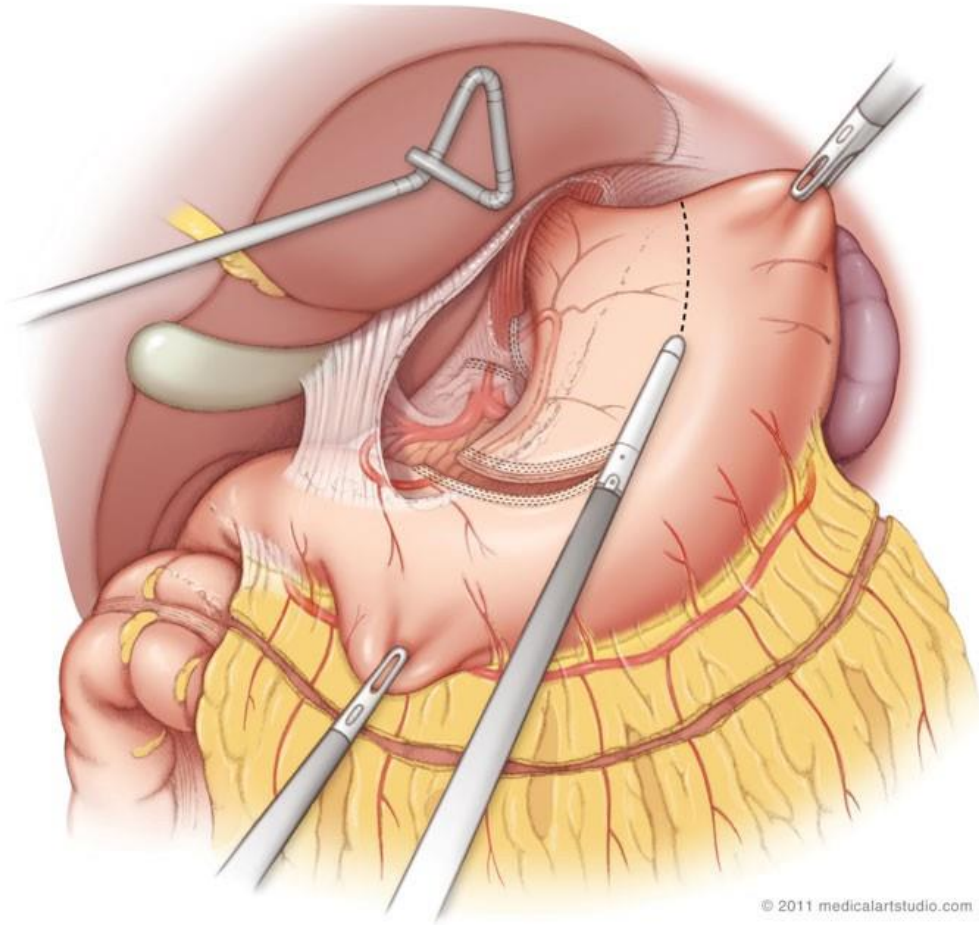
- Esophagogastrostomy
  - Cervical anastomosis vs thoracic anastomosis
  - Hand-sewing and stapling (circular vs linear)

Gastric mobilization with/without tubulization

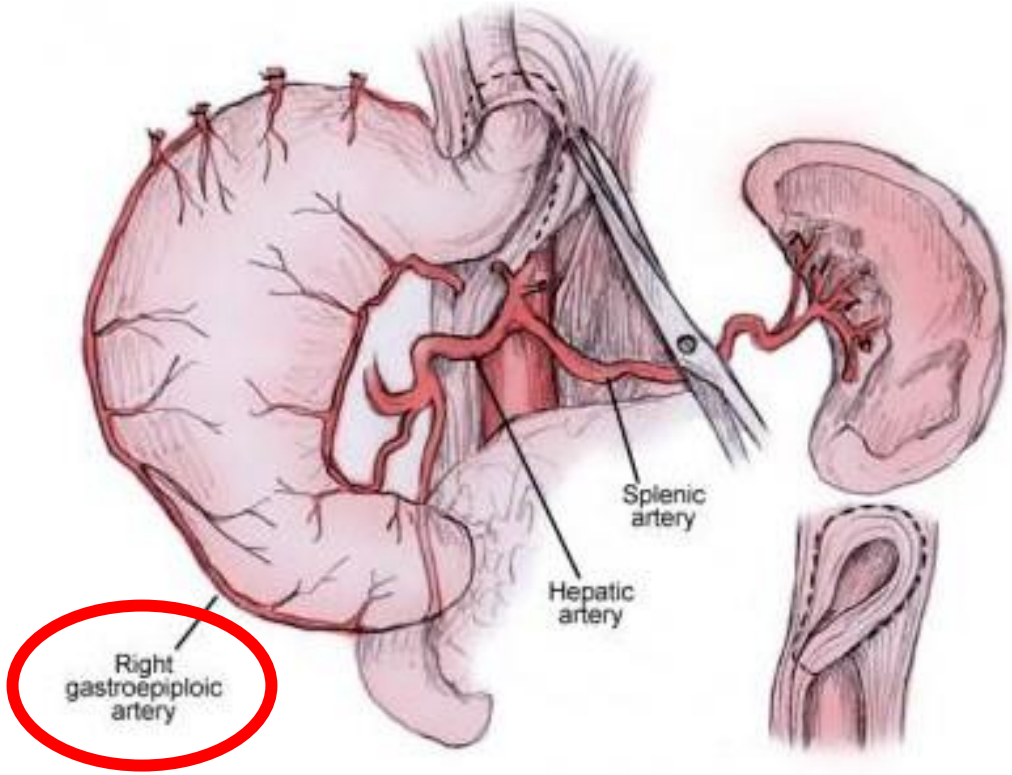


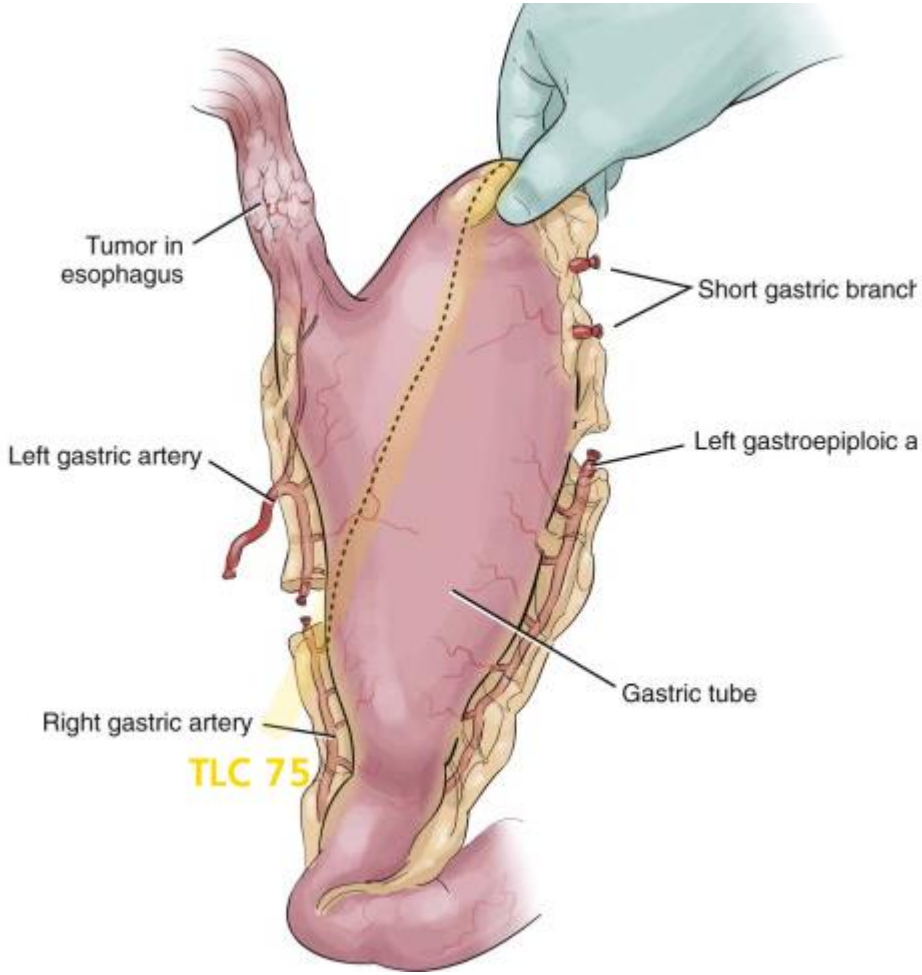
Gastric mobilization with/without tubulization



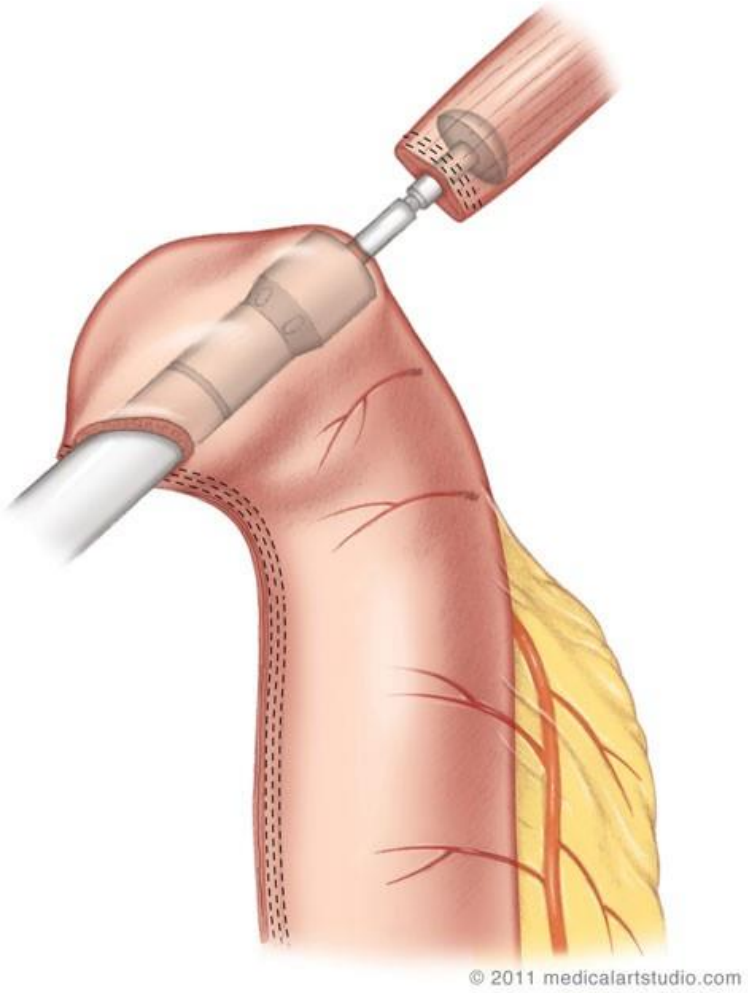


Gastric mobilization with/without tubulization

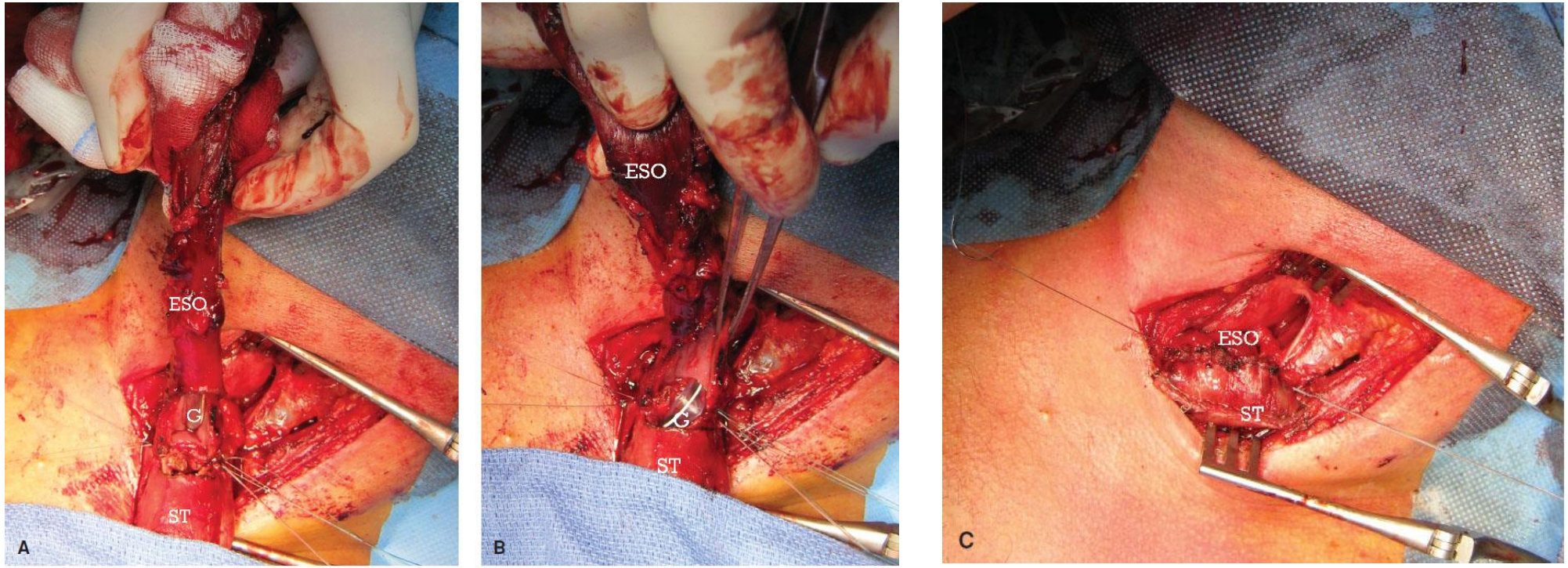




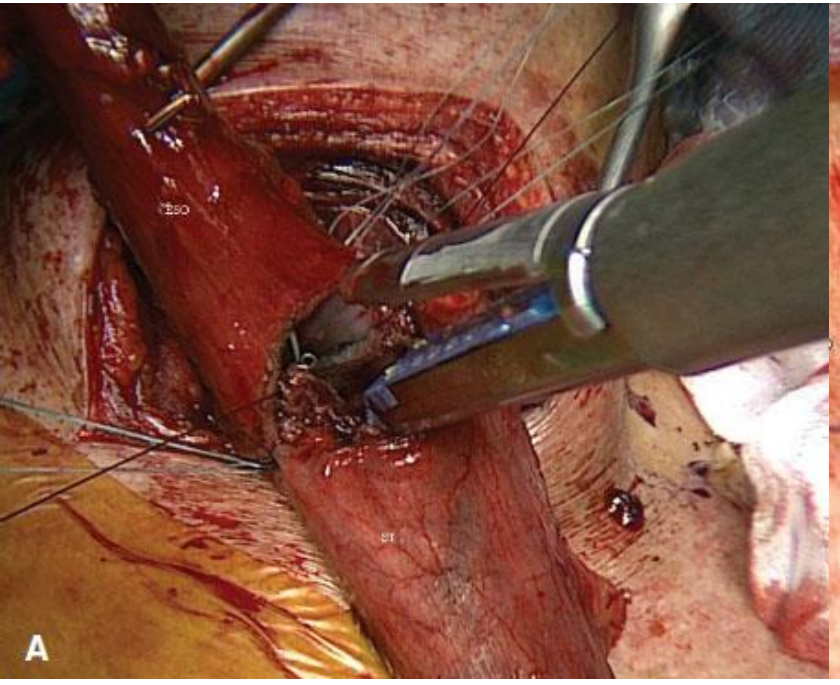
Esophagogastrostomy – circular staple

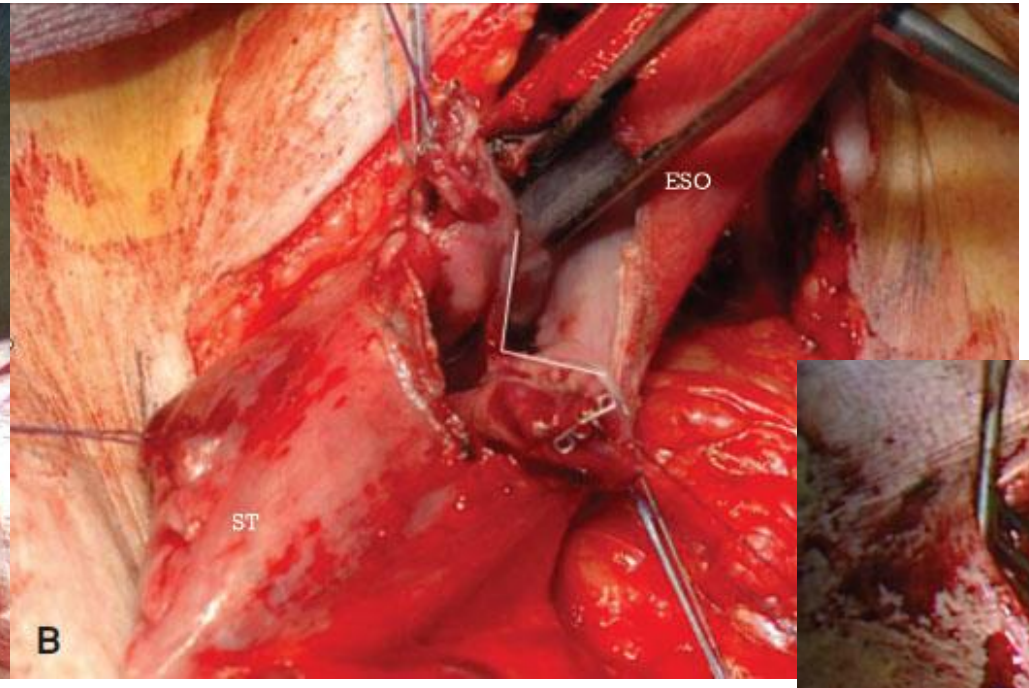


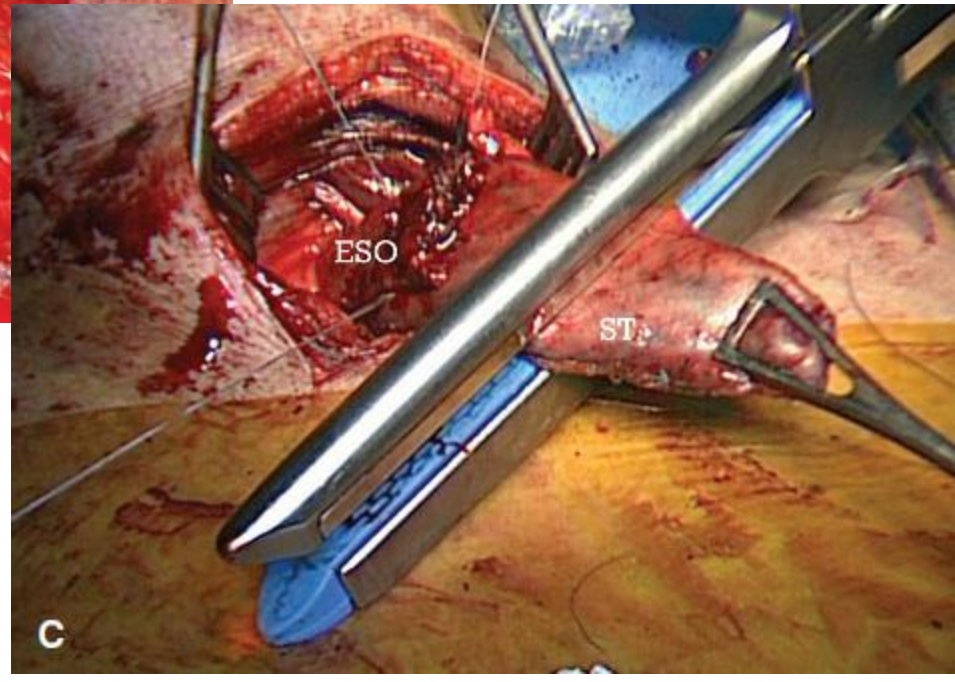
Esophagogastrostomy – hand sewn



Esophagogastrostomy – linear staple







Acceptable operative approaches for resectable esophageal or EGJ cancer

- Ivor Lewis esophagogastrectomy

  (laparotomy + Rt thoracotomy)
- McKeown esophagogastrectomy

  (Rt thoracotomy+ laparotomy + cervical anastomosis)
- Minimally invasive Ivor Lewis esophagogastrectomy

  (laparoscopy + limited Rt thoracotomy)
- Minimally invasive McKeown esophagogastrectomy

  (Rt thoracoscopy + limited laparotomy/laparoscopy + cervical anastomosis)

Acceptable operative approaches for resectable esophageal or EGJ cancer

- Transhiatal esophagogastrectomy

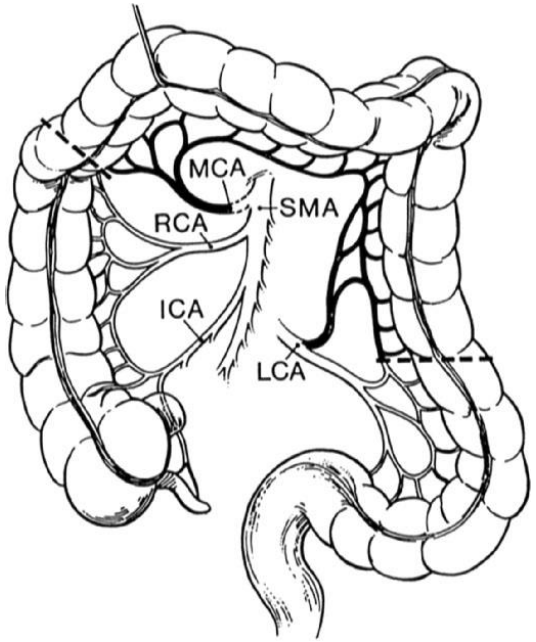
  (laparotomy + cervical anastomosis)

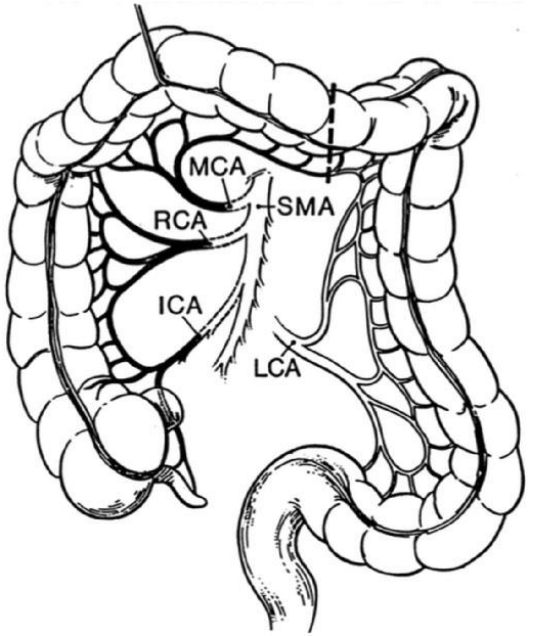
- Robotic minimally esophagogastrectomy

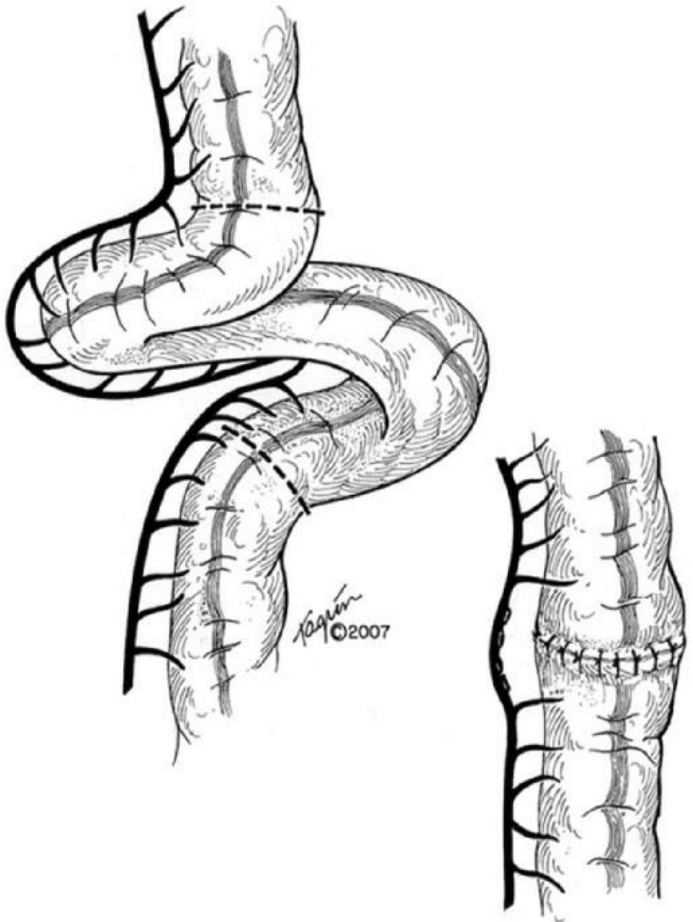
- Left transthoracic or thoracoabdominal approaches with anastomosis in chest or neck

Colon conduit

- Either the left or right colon may serve as an alternative conduit
  - ➢ Lt colon is preferred
  - ➢ The ideal colon conduit includes transverse colon and extends to a point distal to the splenic flexure.



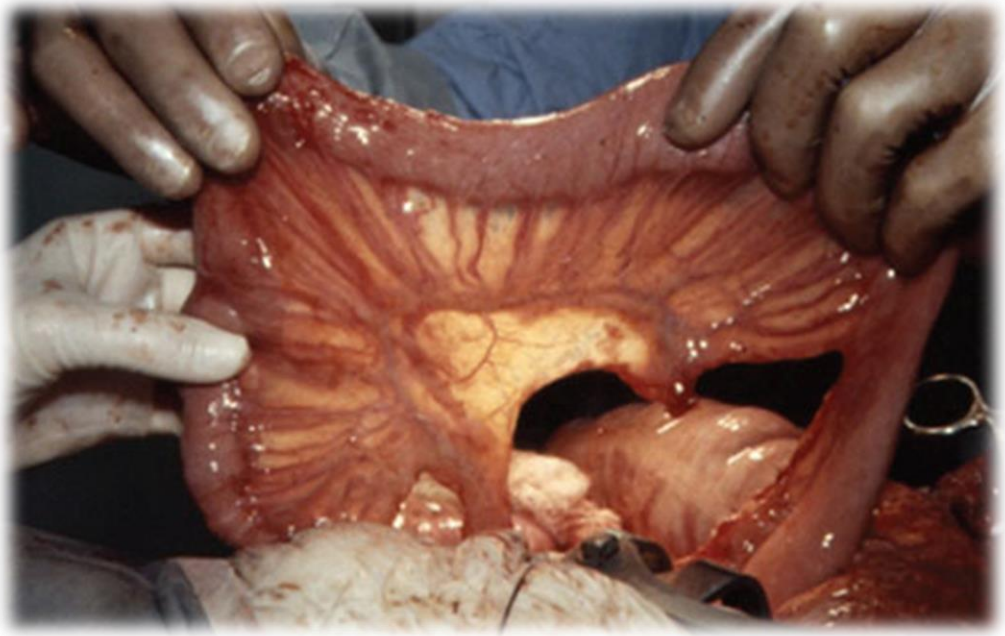


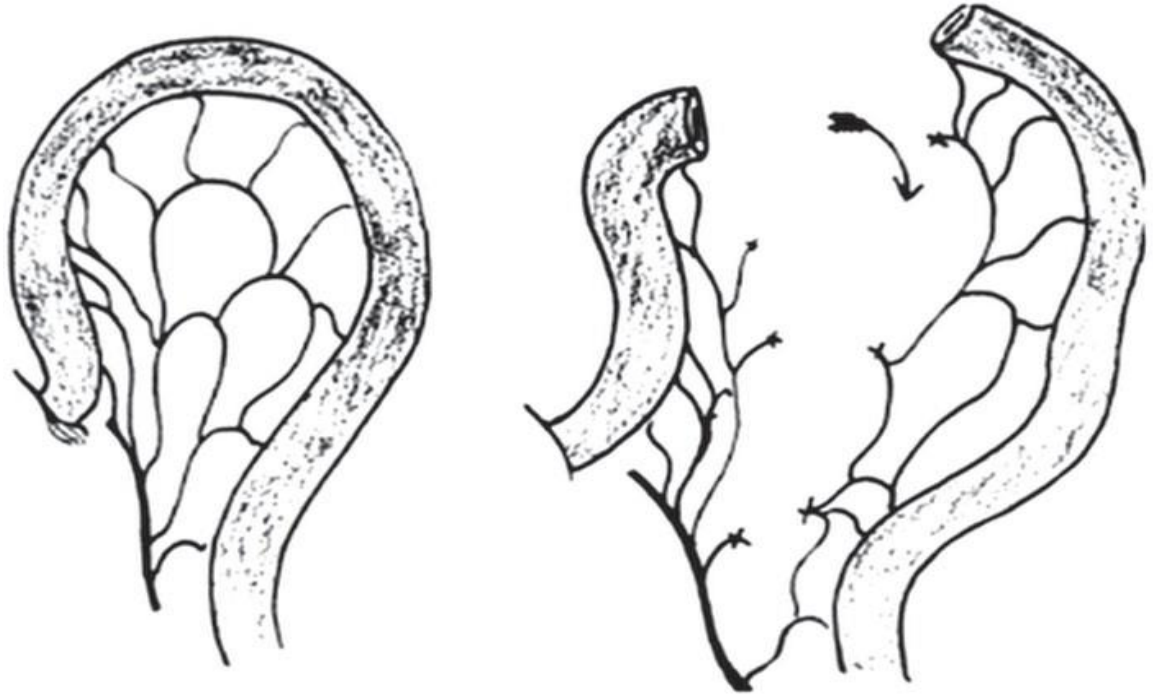


Jejunal conduit

- Pedicle jejunum
  - ➢ Pedicled jejunum is an excellent conduit for replacement of the distal esophagus

- Supercharged jejunum
  - a technique in which the blood supply to the proximal conduit is augmented using microvascular anastomoses between the mesenteric vessels and vessels in the neck





Position of conduit

- Posterior mediastinal
- Substernal
- Transpleural
- Subcutaneous

Other considerations

- Pyloric drainage
  - Not mandatory
  - selective postoperative pneumatic dilation of pylorus

- Feeding jejunostomy
  - allow for early enteral nutrition
  - their own set of complications, including local wound complications, intussusception, and small bowel obstruction.

8th Edition Sheilds' General thoracic surgery