

Benign and Malignant Esophageal Neoplasms, Perforation, Caustic Ingestion



May 26th, 2010

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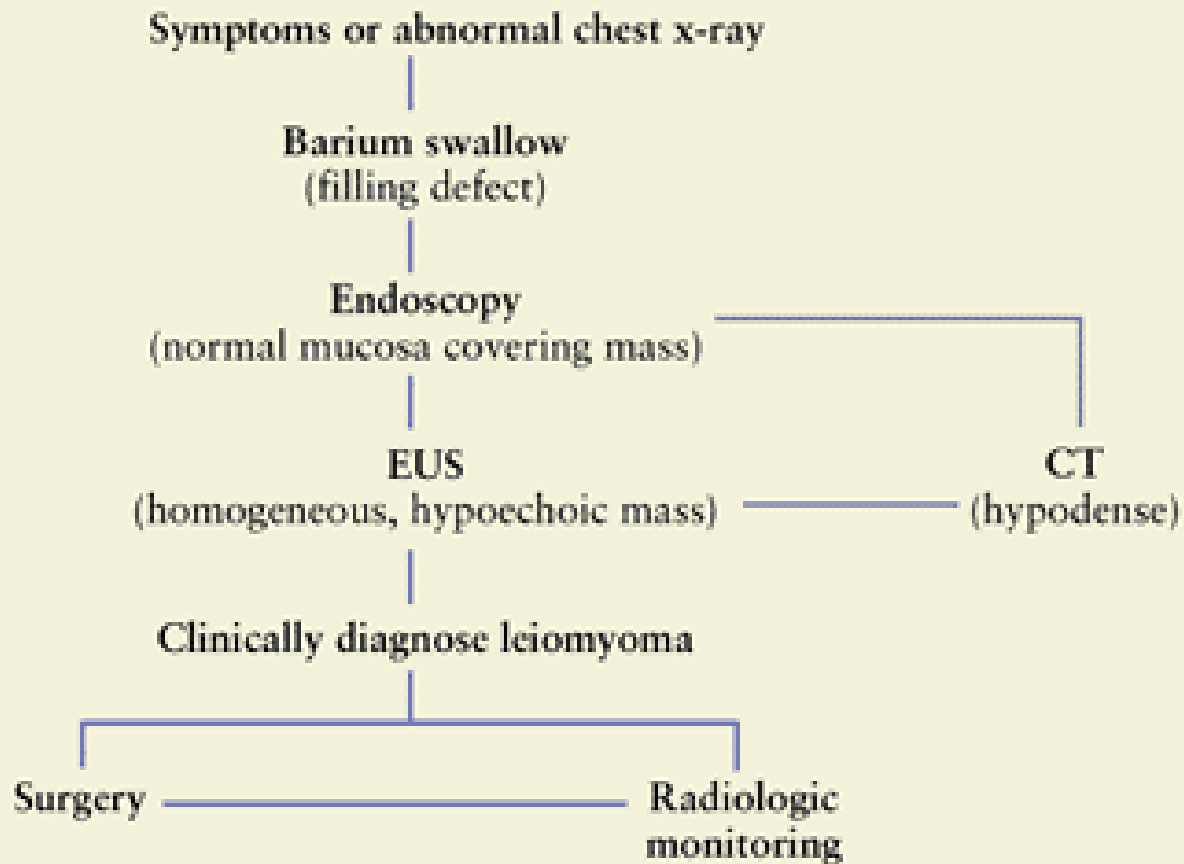
Benign Neoplasms

- Epithelial tumors
 - papilloma, polyp, adenoma, cyst
- Nonepithelial tumors
 - fibromyoma, leiomyoma, lipomyoma, fibroma, mesenchymal tumor, neurofibroma, osteochondroma
- Heterotopic tumors
 - gastric mucosal tumor, melanoblastic tumor, sebaceous gland tumor, granular cell myoblastoma, pancreatic gland tumor, thyroid nodule

Leiomyoma

- 2/3 of all benign tumors
- Indications for resection: dysphagia, >5cm, increase in size, mucosa ulceration, rule out malignant process
- Approach
 - <8cm: extramucosal enucleation
 - >8cm: esophageal resection

Leiomyoma



Malignant Neoplasms

- Majority of esophageal cancer is squamous cell carcinoma or adenocarcinoma
- Incidence of squamous cell cancer decreasing, while incidence of adenocarcinoma rising
- Now equal incidence of each tumor in the U.S.
- 17% overall 5 year survival rate

Risk Factors

- Squamous cell carcinoma
 - Smoking
 - Alcohol
 - Foods containing N-nitroso compounds
 - Underlying esophageal disease (achalasia, caustic strictures)
- Adenocarcinoma
 - Barrett's esophagus
 - GERD
 - High BMI
 - Smoking

Epidemiology

Epidemiology of esophageal cancer in the United States

	Squamous cell	Adenocarcinoma
New cases per year	6000	6000
Male-to-female ratio	3:1	7:1
Black-to-white ratio	6:1	1:4
Most common locations	Middle esophagus	Distal esophagus
Major risk factors	Smoking, alcohol	Barrett's esophagus

Malignant Transformation

- Squamous cell carcinoma
squamous epithelium -> epithelial dysplasia ->
carcinoma in situ -> carcinoma
- Adenocarcinoma
squamous epithelium -> intestinal metaplasia to
columnar epithelium (Barrett's esophagus) -> low-
grade dysplasia -> high-grade dysplasia ->
adenocarcinoma

Clinical Manifestations

- Dysphagia to solids (80%)
- Weight loss (50%)
- Odynophagia (20%)

Staging

- T
 - T1: Invades lamina propria, muscularis mucosa, or submucosa
 - T2: invades muscularis propria
 - T3: invades adventitia
 - T4: invades adjacent structures
- N
 - N1: 1-2 regional LNs
 - N2: 3-6 regional LNs
 - N3: 7+ regional LNs
- M
 - M1: distant mets

Squamous Cell Carcinoma Staging

Squamous cell carcinoma◇					
Stage	T	N	M	Grade	Tumor location §
0	Tis (HGD)	N0	M0	1, X	Any
IA	T1	N0	M0	1, X	Any
IB	T1	N0	M0	2-3	Any
	T2-3	N0	M0	1, X	Lower, X
IIA	T2-3	N0	M0	1, X	Upper, middle
	T2-3	N0	M0	2-3	Lower, X
IIB	T2-3	N0	M0	2-3	Upper, middle
	T1-2	N1	M0	Any	Any
IIIA	T1-2	N2	M0	Any	Any
	T3	N1	M0	Any	Any
	T4a	N0	M0	Any	Any
IIIB	T3	N2	M0	Any	Any
IIIC	T4a	N1-2	M0	Any	Any
	T4b	Any	M0	Any	Any
	Any	N3	M0	Any	Any
IV	Any	Any	M1	Any	Any

Adenocarcinoma Staging

Adenocarcinoma carcinoma				
Stage	T	N	M	Grade
0	Tis (HGD)	N0	M0	1, X
IA	T1	N0	M0	1-2, X
IB	T1	N0	M0	3
	T2	N0	M0	1-2, X
IIA	T2	N0	M0	3
IIB	T3	N0	M0	Any
	T1-2	N1	M0	Any
IIIA	T1-2	N2	M0	Any
	T3	N1	M0	Any
	T4a	N0	M0	Any
IIIB	T3	N2	M0	Any
IIIC	T4a	N1-2	M0	Any
	T4b	Any	M0	Any
	Any	N3	M0	Any
IV	Any	Any	M1	Any

Diagnosis

- Endoscopy and biopsy
- CT chest/abdomen
- PET- to detect mets
- Endoscopic ultrasound- most accurate for locoregional tumor staging

Treatment

Stage	TNM	Treatment
0	TisN0M0	surgery
I	T1N0M0	surgery
IIA	T2N0M0	surgery
	T3N0M0	
IIB	T1N1M0	surgery +/- <u>preop chemorad</u>
	T2N1M0	
III	T3N1M0	surgery +/- <u>preop chemorad</u>
	T4	palliation (<u>chemo</u> , <u>rad</u> , <u>stent</u>)
IV	M1	palliation (<u>chemo</u> , <u>rad</u> , <u>stent</u>)

Treatment

- Only 30-40% resectable at presentation
- Cervical esophageal cancer usually treated like other SCC of head/neck... chemorad preferred over surgery
- Thoracic esophageal cancer requires total esophagectomy due to risk of submucosal skip lesions

Superficial esophageal cancer

- Esophagectomy
- Endoscopic resection
 - For Tis (high-grade dysplasia) or T1a (invades mucosa but not submucosa)
 - If specimen shows deeper invasion, can then get esophagectomy
- RFA, photodynamic therapy
 - For dysplastic Barrett's epithelium
 - Disadvantage: no specimen

Transhiatal esophagectomy

- Exposure with upper midline laparotomy and left neck incision
- Thoracic esophagus bluntly dissected through each incision
- Cervical anastomosis created utilizing gastric pull-up
- Disadvantages: inability to perform full thoracic lymphadenectomy, lack of visualization of mid-thoracic dissection

Ivor-Lewis (transthoracic) esophagectomy

- Exposure with laparotomy and right thoracotomy
- Intrathoracic anastomosis
- Advantages: direct visualization of thoracic esophagus, can perform full lymphadenectomy, lower rate of anastomotic leak
- Disadvantages: greater likelihood of bile reflux

Three-hole esophagectomy

- Exposure with right posterolateral thoracotomy, laparotomy, left neck incision
- Advantages: direct visualization of thoracic esophagus, can perform full lymphadenectomy, lower rate of bile reflux

Adjuvant Therapy

- Timing (pre-operative vs post-operatively) and type (chemo vs rad vs chemorad) controversial
- Surgery alone preferred for stage I
- Neoadjuvant chemorad followed by surgery preferred for stages IIB & III if distal esophageal or GE junction cancer
- Patients with completely resected node-positive cancer who haven't received neoadjuvant therapy should get adjuvant chemo or chemorad

Locally advanced unresectable cancer

- Potentially resectable (T4a)- invasion of pleura, pericardium, diaphragm
- Unresectable (T4b)- invasion of aorta, trachea, heart, great vessels, presence of tracheoesophageal fistula
- Neoadj chemorad may make unresectable disease resectable

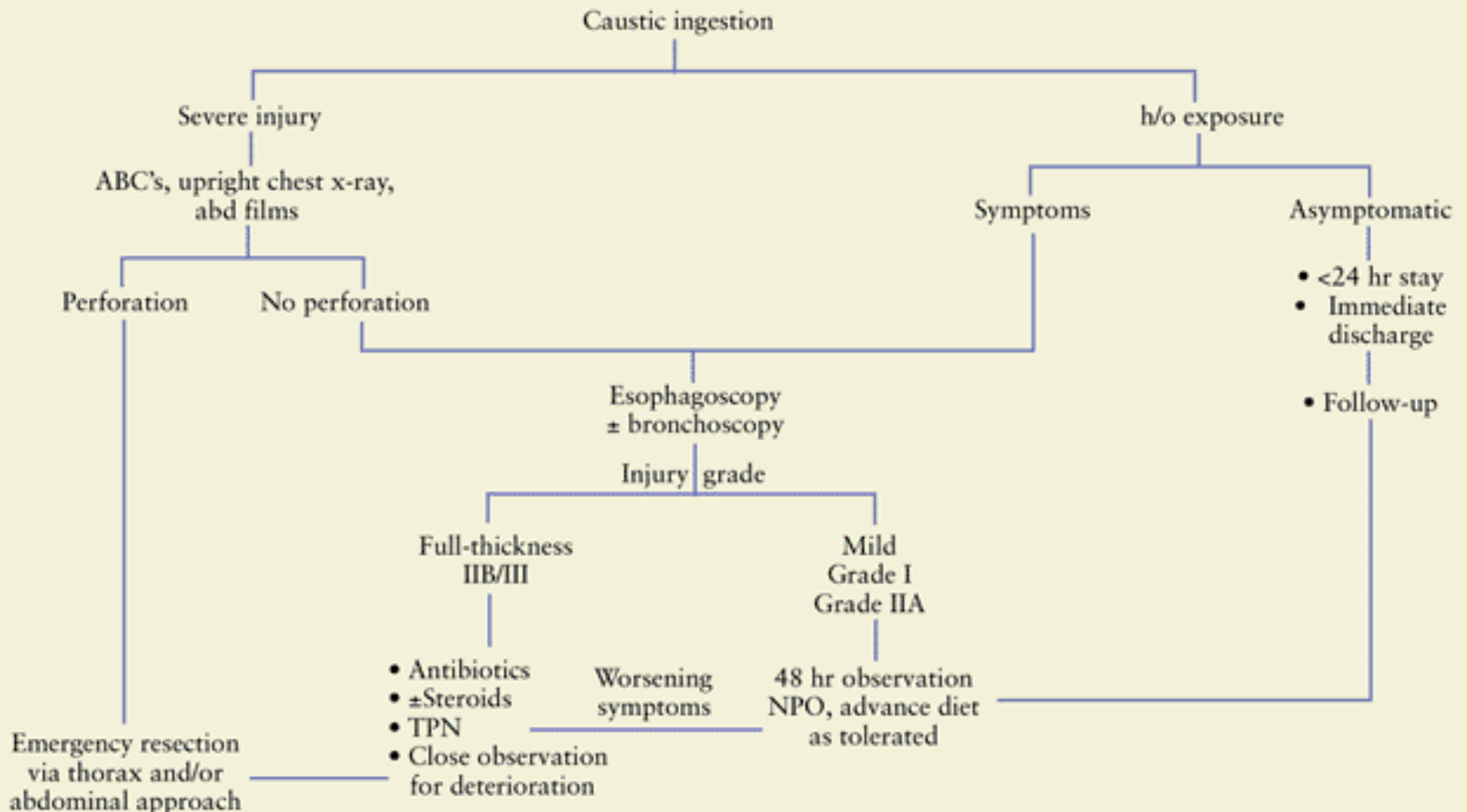
Locally advanced unresectable cancer

- Radiation +/- chemo
- Esophageal dilatation +/- stenting
- Photodynamic therapy, laser ablation

Caustic Ingestion

- Ingestion of strong acids or strong bases
- First step is airway protection... may need tracheostomy
- Endoscopy
 - Minor/questionable ingestion: endoscopy after 24-48 hrs
 - Large ingestion: immediate endoscopy to guide treatment

Caustic Ingestion



Caustic Ingestion

SEQUELAE:

- Esophageal stricture
 - 1/3 of patients with caustic injury develop strictures (more likely if higher grade injury)
 - treat with repeat dilations
- Esophageal squamous carcinoma
 - 1000x higher risk compared to general population
 - usually alkali ingestion
 - begin surveillance 15-20 yrs after exposure with endoscopy every 1-3 yrs

Esophageal perforation

CAUSES:

- Instrumental (59%)
 - Endoscopy
 - Dilation
 - Intubation
- Noninstrumental
 - Swallowed foreign body (12%)
 - Penetrating neck/chest/abd trauma (9%)
 - Corrosive injuries
 - Boerhaave's syndrome

Esophageal perforation

CLINICAL FEATURES:

- Cervical: cervical dysphagia, neck pain, dysphonia, subcutaneous cervical emphysema
- Intrathoracic: symptoms of mediastinitis (tachycardia, tachypnea, fever, leukocytosis)
- Intraabdominal: symptoms of acute abdomen (tachycardia, tachypnea, fever, leukocytosis)

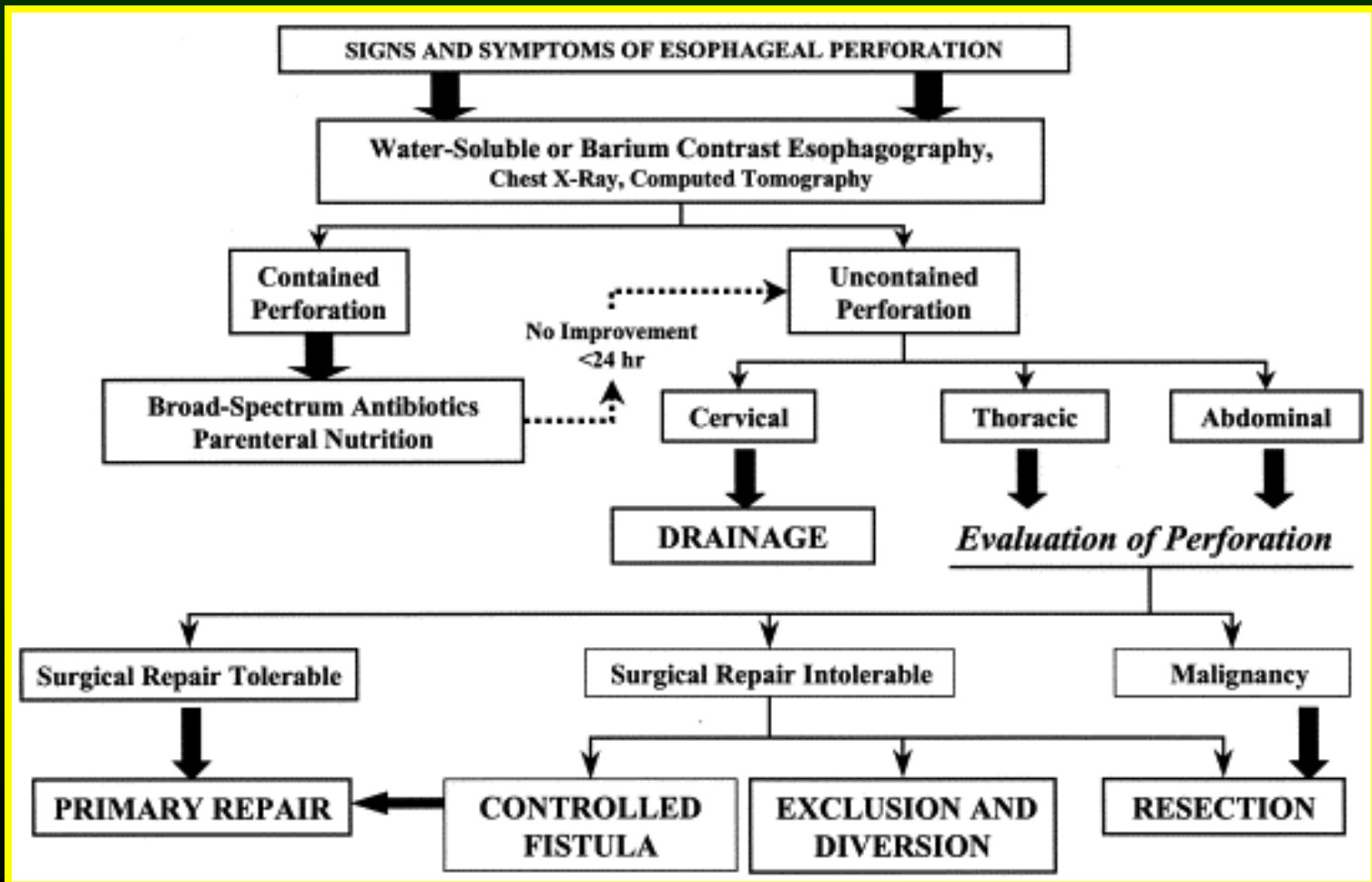
Esophageal perforation

DIAGNOSIS:

- Contrast esophagram with gastrografin (gold standard)
 - repeat with barium if negative with gastrografin
- Flexible endoscopy
 - to help localize for OR planning
 - contraindicated if suspect mucosal tear -> can cause full-thickness tear
- CT- to localize fluid collections

Esophageal perforation

MANAGEMENT:



Esophageal perforation

MANAGEMENT:

- Upper third: cervical drainage
 - left neck incision, G or J tube for enteral feeding
- Middle third:
 - right 5th intercostal thoracotomy, G or J tube, chest tubes
 - buttressed primary repair w/ flaps of pleura, pericardium, diaphragm, omentum, muscle
- Lower third:
 - left 7th intercostal thoracotomy, G or J tube, chest tubes
 - buttressed primary repair w/ pedicled intercostal muscle flap

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