# IATROGENIC OESOPHAGEAL PERFORATION

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## Introduction

- Perforation of the oesophagus although rare presents one of the most vexing management problems in Surgery
- Associated with a every high morbidity and mortality which
- Worse with delay of diagnosis and appropriate treatment<sup>1,2</sup>

#### **Reasons for latrogenic Oesophageal Perforation**

- Oesophageal Dilatation both benign and malignant strictures
- Diagnostic upper GI endoscopy esp rigid
- Transoesophageal echocardiograph
- Oesophageal varices treatment
- Other
  - aortic stent implantation
  - osteosynthesis of cervical spine
  - Endoscopic procedures e.g. mucosectomy

Adapted from Vallbohmer et al 2010, Schmidt 2010

## Diagnosis of latrogenic Oesophageal Perforation

- > Thoracic oesophagus poses the most diagnostic challenges.
- High index of suspicion when oesophagoscopy or intervention procedure is not progressing easily
- Early diagnostic investigation should be instituted before any symptoms or signs
  - endoscopy
  - radiocontrast study
    - plan radiograph may show extraneous gas
    - barium swallow gives better results!
  - Contrast CT scan if diagnosis delayed will show
    - mediastinitis
    - Pus/fluid collections

Symptom	n (%)
Dysphagia	50 (80.6)
Thoracic pain	35 (56.5)
Nausea/regurgitation	31 (50)
Fever	24 (38.7)
Mediastinitis	12 (19.4)
Pleural effusion	11 (17.7)
Subcutaneous emphysema	8 (12.9)
Pneumothorax	8 (12.9)
Mediastinal emphysema	4 (6.5)

Table 2 Clinical presentation of patients with esophageal perforation

Schmidt 2010

Note main symptom dysphagia and odynophagia

Approach to Management of Oesophageal Perforation

- Resuscitation
- Infection source Control
- Closure of perforation
- Nutritional support including enteral access
- Main problems arise from thoracic oesophageal perforations

#### Resuscitation in Perforated Oesophagus

- Late presentation may present in shock
- Resuscitation of chronically dehydrated patients should be cautious
  - they develop pulmonary oedema.
  - use urine output rather than blood pressure to guide fluid requirement.
- Although these patients usually have low albumin, use of albumin as part of resuscitation fluid is not profitable.

## Infection Source Control

- Use of broad spectrum antibiotics
  - parenteral
  - oral antibiotic suspension in addition is controversial
- drain free pleural perforation and mediastinal fluid/pus
  - tube thoracostomy
  - "pigtail" drain under CT guide
- Cervical diversion oesophagostomy in special cases.

# Closure of Perforation<sup>1,2,3,4</sup>

- Operative strategies
  - Thoracotomy repair advocated in early diagnosis but carries significant morbidity and mortality
  - Thoracoscopic repair is alternate technique
  - Endoscopic clip repair (new)
  - Endoscopic suture repair (experimental)
  - T-tube placement
  - Damage control stapling above and below perforation with cervical oesophagostomy or active NGT suction

#### **Stent Perforation Occlusion** <sup>3, 6</sup>

- Traditional plastic stent, e.g. Proctor-Livingstone and Celestine need general anaesthetic (GA)
  - > occlusion or tamponade often incomplete
  - Difficult to remove and need GA
- New covered self-expanding stents placed under conscious sedations
  - > Covered self-expanding stents can be metal or plastic
  - > major problem is stent migration
  - ➤ readily removable
  - ➢ Good results, oral feeding can start early



## **Endoscopic Vacuum Therapy** 7,8

- New strategy of Vacuum Assisted Care has been described
  - Intraluminally placed polyurethane sponge placement
  - Intracavity placed polyurethane sponge
- Large majority healed without recourse to surgery and with very few complications!

#### **Aggressive Non-Operative Treatment** <sup>9</sup>

- Active and aggressive non-operative treatment showed lower morbidity and mortality.
- Drainage of all fluid collections

Tube thoracostomy

CT guided "pig-tail" placement in mediastinum or costophrenic grooves

Discharge	No.	Mortality	Healing At
Cervical esophagus	10		9/10
Primary repair	3	_	Fistula
Abscess drainage	3	_	
Nonoperative	4	_	
Thoracic esophagus	34*	2	31/32
Primary repair	2	(1)	
Surgical drainage	4	(1)	
Nonoperative	28	_	Fistula into empyema tube (subsequently healed)

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\*Excluding 3 dissecting aneurysm patients.

(Vogel 2005)

#### Note: No mortality for non-operative

Variable	Score (range 1-3)
Age >75 years	1
Tachycardia >100 beats/min	1
Leukocytosis >10 000 WBC/ml	1
Pleural effusion (on CXR or CT)	1
Fever >38.5°C	2
Noncontained leak (on CT or	2
barium swallow)	
Respiratory compromise	2
(respiratory rate >30,	
mechanical ventilation)	
Time to diagnosis >24 h	2
Cancer	3
Hypotension	3
Total potential score	18

Table 1 Esophageal perforation severity score

CT, computed tomography; CXR, chest x-ray; WBC, white blood cell. Data from [6\*].

(Sepesi 2010)

# Table 2 Outcomes of patients with esophageal perforation based on a perforation score (0-18)

	Clinical score			
	$\leq 2 (n = 44)$	3-5 ( <i>n</i> =49)	>5 ( <i>n</i> =26)	
Complication rate (%)	53	65	81	
Mortality (%)	2	6	27	
Length of stay (days)	10	16	28	
Data from [6 <sup>•</sup> ]				

Data from [6\*].

(Sepesi 2010)

Note the higher the score, the higher the complications and mortality

#### Summary

- latrogenic perforation rare but dread complication of upper GI diagnostic and interventional endoscopy
- Challenges with diagnosis for oesophagus thoracic
  - Late intervention
  - ➢ High mortality
  - Demands high level of vigilance
- Malignant perforations managed with endoluminal stents
- Benign perforations
  - Aggressive non-operative management
  - Drainage of fluid or pus collections
  - VAC drainage new strategy
  - Diversion oesophagostomy in special cases especially long or multiple caustic strictures
  - primary debridement and repair eschewed
- Nutritional support paramount preferably enteral
- New oesophageal perforation score helps with prognosis
- Single key predictor of good outcome is early diagnosis and intervention .

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