Bronchopleural Fistula Post Esophagectomy: An Unusual Complication

- Presented by: Dr Enoch Makori
- Date: 9th January 2025

Introduction

- **Definition**: Bronchopleural fistula (BPF) is an abnormal connection between the bronchial tree and pleural space.
- **Context**: Rare but severe complication following esophagectomy.
- **Importance**: High morbidity and mortality; early detection and management are crucial.

Pathophysiology

Underlying Causes

- Postoperative infection.
- Tissue ischemia at the anastomotic site.
- Mechanical stress on the bronchial stump.

Mechanism:

- Breakdown of surgical anastomosis.
- Communication established between airway and pleural cavity.

Risk Factors

Preoperative

- Poor nutritional status.
- Advanced malignancy.

Intraoperative

- Prolonged surgery duration.
- Technical errors in anastomosis.

Postoperative

- Pulmonary infections.
- Delayed wound healing.

Clinical Presentation

Symptoms

- Sudden onset dyspnea.
- Persistent air leak with pneumothorax.
- Cough with serosanguinous sputum.

Signs

- Fever and signs of sepsis.
- Reduced breath sounds on the affected side.
- Increased pleural drainage

Diagnosis

Imaging

- Chest X-ray: Pneumothorax or pleural effusion.
- CT Scan: Detailed view of the fistulous tract.

Endoscopic Evaluation

- Bronchoscopy: Direct visualization of the defect.
- Laboratory:
- Analysis of pleural fluid for infection markers.

Management Strategies

Conservative

- Chest tube drainage.
- Antibiotics and nutritional support.

Interventional

- Bronchoscopic closure using sealants or stents.

Surgical

- Direct repair of the fistula with reinforcement (intercostal muscle, pleura, omentum)

Prognosis and Outcomes

Prognosis

- Dependent on early detection and timely intervention.
- Associated complications: empyema, prolonged hospitalization.

Outcomes

- Improved with advanced surgical and bronchoscopic techniques.
- Mortality rates remain significant in delayed cases.

Case Studies

Successful early diagnosis and repair of a large BPF.

- Lessons Learned:
- Importance of multidisciplinary approach to determine tissue planes and resectability preop.
- Avoiding unnecessary use of energy devices near airway.
- High index of suspicion.

Patient M.W 67 y Female

- ESCC at 28cm, Grade 2, T3NoMo
- Discussed at MDT 8 weeks post NARCT(25 fractions, 40.4 Gy)(5cycles Paclitaxel/Carboplatin)
- ECOG 1, nutritional status good.
- Restaging CT scans- resectable, with no esophageal-pleural/bronchial fistula
- Offered 3 stage esophagectomy with lymph node clearance.
- Preoperative evaluation- Normal parameters of laboratory tests (TBC, UEC, LFT, HIV/Hepatitis serology)

Case presentation

- Intraoperatively- McKeowns with Right posterolateral thoracotomy, with left double lumen ETT with right lung isolated. Findings:
- Bulky mid-esophageal tumor with good planes with aorta, azygous, pericardium. Freed with ease.
- Right principal bronchus **indented** but not invaded by bulky tumor. Using Ligasure energy device, esophagus separated from bronchus using plane already developed from inferior dissection.
- **No obvious injury to bronchus noted.** Thoracic stage completed uneventfully. Lung reinflated, chest closed with pleural drain

Case presentation

- Abdominal stage completed uneventfully with suture esophago-gastric anastomosis in the neck.
- Extubated on table and transferred to HDU.
- Chest tube had no bubbling.
- HDU admission lab investigation- TBC, CRP, Albumin, UEC
- CXR- No pneumothorax, lung expanded
- Kept nil by mouth. Started continuous jejunostomy feeding day 1 morning
- Routine meds- analgesia, antibiotics

Trends

Parameter	WBC	Neutr	PCT	CRP	Albumin
Day 1	3.8	67%	<0.5		33
Day 2	8	77%	<0.5		30
Day 3	9	75%	0.7		29

	Day 1	Day 2	Day 3	Day 4
uwsd	250 (bloody)	350 (serosanguine	300 (Turbid)	400 (Purulent)
	No bubbling	No bubbling	Bubbling	Bubbling

- Repeat CXR- Pneumothorax with moderate volume effusion right side.
- Infected chest tube insertion site. Purulent drainage.
- Decision made to re-explore.
- Repeat Right thoracotomy, findings:

✓ Purulent effusion 300mls

✓ Gastric conduit healthy, pink with obvious defect

✓ 1cm*1cm lateral aspect of mainstem bronchus discrete, circular defect with surrounding area of denuded bronchial wall

- Done: Thorough chest lavage, refreshed edges of bronchial defect, direct suture repair- interrupted mattress prolene 4/0 with intercostal muscle buttress.
- Tested for air leaks, no leak.
- Chest routinely closed.

- Rest of post operative course unremarkable
- Discharged on day 11 in good general condition

Conclusion

Key Takeaways

- Bronchopleural fistula post-esophagectomy is rare but life-threatening.
- Early diagnosis and tailored management are critical.
- Multidisciplinary collaboration improves patient outcomes.