



**ORIGINAL RESEARCH PAPER**

**Radiodiagnosis**

**UNDETECTED RESPIRATORY-ESOPHAGEAL FISTULAE IN SYMPTOMATIC ADULTS : A PROSPECTIVE STUDY OF 6 CASES IDENTIFIED ON BARIUM SWALLOW EXAMINATION.**

**KEY WORDS :** Tracheo-esophageal Fistula, Broncho-esophageal Fistula, Barium Swallow

**Tolani Archna A.\*** 3<sup>rd</sup> year Resident, M.D. Radiodiagnosis, Department of Radiodiagnosis, MGM Hospital, MGM Institute of Health Sciences, Kamothe, Navi Mumbai \*Corresponding Author

**Kapoor Priti** (Ex Capt AMC), M.D., Professor & HOD, Department of Radiodiagnosis, MGM Hospital, MGM Institute of Health Sciences, Kamothe, Navi Mumbai

**ABSTRACT**

**Aim:**

- Establish incidence of undetected respiratory-esophageal fistulae (REF) in local adult population.
- Evaluation of different presentations of REF in adults.
- Study etiological associations.
- Follow up the cases detected and observe outcome.

**Methods :** Over period of one year(September 2016 to September 2017), out of 151 adult patients referred to Department of Radiodiagnosis, MGM Hospital Kamothe for barium swallow examination, 6 adult patients of REF were picked up and enrolled. They were above 18 years of age, male and female. Patients below 18 years of age were excluded.

**Results :** Out of the 6 cases, 3 were acquired broncho-esophageal fistulae (BEF) due to esophageal carcinoma, 1 was H type tracheo-oesophageal fistula (TEF) due to esophageal carcinoma, 1 was congenital H type TEF, 1 had equivocal suspicion of post-tuberculosis BEF vis a vis congenital etiology.

**Conclusion :** Diagnosis of REF is challenging. Esophagography is a sensitive test for diagnosing this condition.

**Discussion :** REF are rare. Symptoms are insidious and inconspicuous; hence high degree of suspicion is required for diagnosis. Non ionic contrast medium under fluoroscopic guidance is the preferred examination.

**INTRODUCTION :**

Respiratory-esophageal fistulae as the name suggests, are communications between the respiratory system and the esophagus. They could be tracheo-esophageal or broncho-esophageal.

Respiratory-esophageal fistulae can be congenital or acquired. Acquired causes include malignancy, mediastinal inflammation due to tuberculosis, histoplasmosis, Crohn's disease etc. Congenital fistulae without atresia of esophagus may present in adulthood. The symptoms are often gradual in onset and inconspicuous, hence the diagnosis is difficult. It requires a high degree of suspicion to diagnose respiratory-esophageal fistulae and establish its cause. Though non-ionic contrast is the safest, single contrast barium swallow using diluted barium can be used to make the diagnosis. CT scan can be used to determine etiology and associated lung parenchymal involvement.

**AIM :**

- To establish the incidence of hitherto undetected respiratory-esophageal fistulae in local adult population, with nonspecific symptoms.
- Evaluation of the different presentations of respiratory-esophageal fistulae in adults.
- To study etiological associations in adult respiratory-esophageal fistulae.
- To follow up the cases detected at our study and observe the outcome.

**METHODS :**

- Over a period of 1 year, from September 2016 to September 2017, 151 symptomatic patients were referred for barium swallow examination to the department of Radiodiagnosis, MGM Hospital Kamothe, among these, 6 patients were detected with respiratory-esophageal fistulae and were enrolled in our study. As soon as a respiratory-esophageal fistula was identified, the study was aborted, documented on films and the clinicians were alerted. They were subjected to additional radiological investigations SOS and followed up to observe the post-diagnostic outcome, making a note of their management and wherever possible, postoperative imaging was carried out.

**INCLUSION CRITERIA:**

- Patients included were all above 18 years of age, including both men and women.

**EXCLUSION CRITERIA:**

- Patients below 18 years of age were excluded.
- Diagnosed cases of respiratory esophageal fistulae were excluded.

**Observation & Preparation of Patients:**

- Overnight fasting, avoiding smoking or chewing gum was required prior to the study.
- After obtaining written consent from the patient, the procedure was done under fluoroscopic guidance.
- As soon as a respiratory-esophageal fistula was identified, the study was aborted and documented on films and the clinicians were alerted.

**Equipment :**

- Barium swallow examination was performed on Xray machine 800mA Allengers HF with IITV System.

**RESULTS :**

**Out of the 6 cases,**

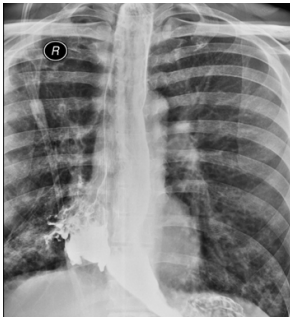
- 1 case, already treated with AKT 4 years back, was suspected to be post-tubercular broncho-esophageal fistula, however no convincing evidence of Kochs' was revealed at surgery or in the laboratory tests.
- 1 case was of congenital H type tracheo-esophageal fistula or possibly an esophageal diverticulum eroding into the trachea.
- 3 cases were acquired broncho-esophageal fistulae due to esophageal carcinoma and 1 case was of tracheo-esophageal fistula due to esophageal carcinoma
- All of them were followed up. While four of them were cases of esophageal carcinoma and were managed conservatively, two of the patients underwent surgery. The fistulae were confirmed at surgery, repaired and showed good recovery post-operatively.

**Case 1:**

- A 40-year-old man presented with a chief complaint of dyspnoea on exertion(NYHA Grade II), coughing while eating and drinking, generalized weakness and occasional dysphagia

since four to five years. His past medical history revealed that he had been treated for Pulmonary Tuberculosis, and was undergoing conservative treatment for gastro esophageal reflux disease, asthma, and recurrent respiratory infections while personal history elicited alcohol abuse. The patient denied any incidents of swallowed bones or chest trauma or any history of instrumentation, or accidental foreign body ingestion. The patient was chronically on inhalers and taking budesonide and levosulbutamol for his asthma. The physical examination was unremarkable except for expiratory wheeze and diminished breath sounds heard on at the lung bases with mild inspiratory crackles.

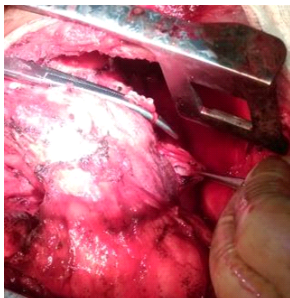
- Barium swallow demonstrated the fistula between the esophagus and right lower lobe bronchus, with barium filling into the bronchial tree.
- CT scan was done which showed a poorly demarcated fistula between esophagus and the right posterior lower lobe bronchus, also extensive bronchiectasis in right middle lobe and lower lobe with retained barium in the bronchiectatic cavities.
- The patient underwent thoracotomy with decortication to remove the broncho-esophageal fistula.
- Histopathology reports confirmed the fistulous tract; however the lymph node dissected during surgery, at HPE, showed no evidence of tuberculosis.
- The patient made a full recovery with no complications or recurrence of symptoms.



**Fig 1: Barium swallow demonstrating the fistula between the esophagus and right lower lobe bronchus and barium filled bronchiectatic areas.**



**Fig 2: CT scan showing extensive bronchiectasis in right middle lobe and lower lobe with retained barium in the bronchiectatic cavities.**



**Fig 3 :Intraoperative view of the broncho esophageal fistula.**



**Fig 4 A post-operative esophagogram showed no evidence of broncho esophageal fistula or esophageal leak. The patient is being followed up regularly and is asymptomatic.**

**Case 2 :**

A 55year old male, non-smoker, presented with history of dysphagia and chronic intermittent cough since four years, sometimes initiated and aggravated after heavy meals. No significant history of hemoptysis, shortness of breath, or choking was present. There was no history of tuberculosis and instrumentation of esophagus or airway. Direct questioning after diagnosis had been made revealed a history of coughing on drinking liquids hurriedly. Systemic examination was unremarkable.

Barium swallow showed a tracheo–esophageal tract at the level of hyoid bone which led the barium to enter into the right main bronchus (Fig 5, 6).

Surgical repair and closure of the fistula was done. Biopsy from this fistula was negative for tuberculosis (TB) and malignancy. So the possibility of a congenital fistula or an esophageal diverticulum eroding to the trachea was considered.



**Fig 5**



**Fig 6**

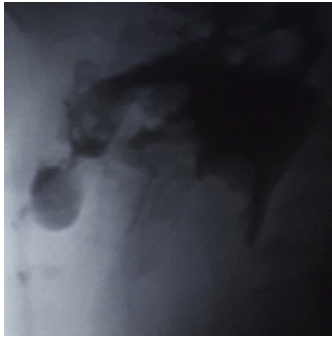
**Case 3 :**

A 60-year-old male with complaints of chest pain, cough and dysphagia for two weeks. The patient also had a history of loss of appetite and loss of weight.

CECT of neck revealed a moderately enhancing mass approx 4cm long, in hypopharynx and upper esophagus causing luminal

compromise suggestive of Carcinoma esophagus.

On barium swallow patient had stricture in hypopharynx and upper esophagus causing narrowing of the lumen of the oesophagus with proximal dilatation and holding-up of contrast agent and also communication of trachea and esophagus suggesting tracheo-esophageal fistula. (Fig 7)



**Fig 7**

**Case 4 :**

35 year old female, complaining of inability to tolerate food, throat pain, cough, and hoarseness.

Barium swallow showed a long segment stricture in mid esophagus measuring 6 cm causing mucosal irregularity and shouldering suggestive of Carcinoma mid esophagus. A tract of barium was seen entering the left main bronchus. There was also collapse of left lung, pleural involvement on left side and a metastatic nodule in right lower zone. (Fig 8)

The patient is presently under treatment for carcinoma esophagus

**Case 6:**

A 70-year-old woman, known case of carcinoma esophagus, with 9-month history of dysphagia to solids and 4-month history of dysphagia and coughing to liquids. She was severely dehydrated and cachexic.

Barium swallow showed a 2cm long stricture in mid esophagus with mucosal irregularity and shouldering. There was faint opacification of the left main bronchus seen due to fistula.

**The patient has not reported back after the study.DISCUSSION :**

Sr. No.	Age	Sex	Chief Complaints	Duration of symptoms	Past history	Diagnosis	Etiology
1.	40	M	Dyspnoea on exertion, coughing while eating and drinking, recurrent respiratory infections	4 years	Pulmonary kochs, GERD	Fistula between right lower lobe bronchus and esophagus	Congenital /post-tuberculosis
2.	55	M	Dysphagia, coughing on drinking liquids hurriedly	5 years	nil	Trachea-esophageal fistula at level of hyoid bone	Congenital / possibly esophageal diverticulum eroding into trachea
3.	60	F	Chest pain, cough, dysphagia	2 weeks	nil	Trachea-esophageal fistula at level of proximal esophagus	Malignant
4.	35	F	inability to tolerate food, throat pain, cough	6 months	Known case of carcinoma esophagus	Fistula between left main bronchus and esophagus	Malignant
5.	55	M	dysphagia, cough	6 months	nil	Fistula between left main bronchus and esophagus	Malignant
6.	70	F	dysphagia and coughing to liquids	9 months	Known case of carcinoma esophagus	Fistula between left main bronchus and esophagus	Malignant

- Respiratory-esophageal fistulae are rare.

They can be congenital or acquired. Acquired respiratory esophageal fistulae are more common, with malignancy being the most common cause. Chronic inflammatory conditions like tuberculosis, histoplasmosis, Crohn's disease also contribute to the formation of REF. Tuberculosis, being endemic in our country must be included in the differential diagnosis of adult REF. There have been other cases reported of REF secondary to foreign body swallowing [6], trauma following upper gastrointestinal

endoscopy[5]and blunt chest injury[7]. Congenital fistulae without atresia of esophagus may present in adulthood. [3,4]

- Diagnosis of acquired respiratory-esophageal fistulae is challenging due to nonspecific and insidious nature of its symptoms.[1]
- Most common presenting symptoms are coughing while eating or drinking liquids and recurrent respiratory infections. [2]
- Conventional barium swallow, though it can delineate the REF

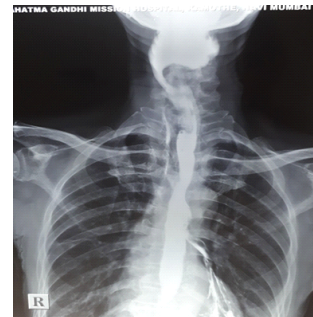


**Fig 8**

**Case 5:**

55 year old male with complains of dysphagia, coughing, and fever.

Barium swallow showed a stricture 2cm long in mid esophagus with shouldering. There was passage of barium seen into the left bronchus. (Fig 9).



**Fig 9**

very well, is not the investigation of choice in cases with suspicion for REF as there are concerns for safety in view of the potential toxicity of barium to the lung tissue. Non ionic contrast medium under fluoroscopic guidance is preferred for demonstration of fistulae and for detection of post-operative leaks.

- In our study, where in all 6 cases, REF were incidentally picked up, the procedure was immediately aborted as soon as a fistula was detected.
- CT scan has a proven role in the detection of respiratory esophageal fistulae, however, Chest CT may not confirm the fistula in case of lung tissue destroyed by chronic lung infection or a collapsed fistula tract.[9]

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