Introduction

Tuberculosis of the esophagus is a rare condition. Esophageal tuberculosis accounts for 2.8% of all cases of gastrointestinal tuberculosis as reported by us earlier (1). Most of the studies are reported from areas where tuberculosis is endemic but with the world-wide spread of HIV infection which is often complicated by tuberculosis, there will be an upsurge in the reported cases of this infection from all over globe. Esophageal tuberculosis usually occurs as a result of direct extension of infection from mediastinal lymph nodes (2). Rarely infection may spread from the lung, spine or via the blood stream. Endoscopic findings are non-specific and included shallow ulcers, heaped up lesions and extrinsic compression of the esophagus (3-5). Majority of cases achieve cure with adequate anti-tuberculous medication. Surgery is required in cases of fistulas, perforations and occasionally bleeding ulcers (6). Since tuberculosis and malignancy may have similar clinical and endoscopic features, it is essential to rule out tuberculosis if the histopathology is negative for malignancy. The clinical, radiologic, and endoscopic features of esophageal tuberculosis

Esophageal Tuberculosis: An Analysis of Fourteen Cases

Rajiv Baijal¹, Subash Agal², Deepak Narayan Amarapurkar³, Praveen Kumar HR¹, Nagaraj Kotli¹, Mayank Jain¹

¹Gastroenterology Centre Jagjivanram Hospital, ²Western Railway Hospital, ³Kokilaben Dhirubhai Ambani Hospital and Medical Research Centre, Mumbai, Bombay Hospital, Mumbai

Abstract

Background and objectives: Esophageal tuberculosis is a rare condition. It may be primary or secondary to tuberculosis elsewhere in the body. The present report describes the clinical features, endoscopic findings, radiologic abnormalities and outcome of anti-tuberculous treatment in a series of 14 verified cases of tuberculosis of the esophagus.

Methods: All esophagogastroduodenoscopic examinations performed for persistent dysphagia between January 1996 and August 2008 were screened for the presence of esophageal ulcers or mass lesions; of them with verified diagnosis of esophageal tuberculosis constituted the study group.

Results: There were 3 men and 11 women whose age ranged from 25-70 years (mean 38.6 years). The presenting complaints were dysphagia (11 patients), odynophagia (6 patients), fever with weight loss (3 patients), cough while swallowing (1 patient) and hematemesis (1 patient). Endoscopic findings included mid esophageal ulcer in 8 patients; submucosal tumor, 2; mid esophageal mass, 2; mass lesion at GE junction, 1; and a fistula communicating with the bronchus, 1. Chest CT scan revealed enlarged necrotic mediastinal lymph nodes in 10 cases. The biopsy and/or cytological specimens showed acid-fast bacilli, granuloma or both in 13 patients. All patients were administered antituberculous treatment; 1 patient required surgery. All patients revealed healing of lesions on repeat endoscopy.

Conclusion: Dysphagia was the commonest presentation. Ten (71.4%) patients had associated enlarged necrotic mediastinal lymph nodes. Histological and/or microbiological proof was obtained in 13 of 14 (92.8%) cases. Thirteen patients responded to antituberculous therapy and 1 patient required surgery. (J Dig Endosc 2010;1:14-18)

Key words: Esophageal tuberculosis, dysphagia, lymph nodes, histopathology

Introduction

Tuberculosis of the esophagus is a rare condition. Esophageal tuberculosis accounts for 2.8% of all cases of gastrointestinal tuberculosis as reported by us earlier (1). Most of the studies are reported from areas where tuberculosis is endemic but with the world-wide spread of HIV infection which is often complicated by tuberculosis, there will be an upsurge in the reported cases of this infection from all over globe. Esophageal tuberculosis usually occurs as a result of direct extension of infection from mediastinal lymph nodes (2). Rarely infection may spread from the lung, spine or via the blood stream. Endoscopic findings are non-specific and included shallow ulcers, heaped up lesions and extrinsic compression of the esophagus (3-5). Majority of cases achieve cure with adequate anti-tuberculous medication. Surgery is required in cases of fistulas, perforations and occasionally bleeding ulcers (6). Since tuberculosis and malignancy may have similar clinical and endoscopic features, it is essential to rule out tuberculosis if the histopathology is negative for malignancy. The clinical, radiologic, and endoscopic features of esophageal tuberculosis

Reprint requests and correspondence:
Dr Rajiv Baijal
Dept. of Gastroenterology, Jagjivanram Hospital, Mumbai Central, Mumbai-08 India
E-mail: rajivbaijal@hotmail.com

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are not well-defined because of its rarity and also its close resemblance with other symptomatic esophageal disorders. The present study describes the clinical symptoms, radiological and endoscopic findings and response to treatment in esophageal tuberculosis.

Methods

The present study is a retrospective review of hospital records of verified cases of esophageal tuberculosis seen at the Gastroenterology Centre at Jagjivanram Hospital, Western Railway Hospital and Bombay Hospital, Mumbai. During twelve-and-half-year period encompassing between January 1996 and August 2008, we reviewed all patients who underwent upper GI endoscopic examinations and had abnormal endoscopic findings of the esophagus consisting of ulceration and/or mass lesion. Of the total a total 683 cases screened, 14 verified cases of esophageal tuberculosis were identified. The case records were analysed for clinical features, endoscopic, radiological, histopathological, and bacteriological findings, and outcome of treatment.

A definitive diagnosis of TB was made by demonstration of granulomatous inflammation on histopathological examination with positive Ziehl-Neelsen (ZN) staining on microscopy. A presumptive diagnosis of TB was made when granulomatous inflammation was seen on microscopy, or when visual inspection on endoscopy was suggestive of TB and the patient’s clinical response to antituberculous treatment was good.

Results

There were three women and 11 men with mean age of 38.6 years (range 25-70 years). All patients had secondary tuberculosis of the esophagus.

Clinical features

The common presenting features were dysphagia (11 patients), odynophagia (6 patients), fever with weight loss (3 patients), cough while swallowing (1 patient) and hematemesis (1 patient) (Table 1). Three patients (patients 4, 5 and 14) complained of fever. One patient (patient 14) presented with features of esophago-bronchial fistula. The clinical diagnoses included carcinoma esophagus in 10 patients, pill esophagitis in 2 patients, reflux esophagitis in 1 patient and esophageal tuberculosis in 1 patient. One patient had long standing diabetes mellitus. Another patient was immunocompromised due to HIV infection and had pulmonary tuberculosis as well.

Radiological findings

Radiography of the chest was abnormal in three

Table 1: Clinical features; radiological, endoscopic, histopathological and bacteriological findings; and response to treatment in a series of 14 patients

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Age /sex</th>
<th>Symptoms</th>
<th>Chest radiography</th>
<th>Enlarged mediastinal LNs at chest</th>
<th>Endoscopic findings</th>
<th>CT chest Positive H/P and/or cytology for tuberculosis</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>34/M</td>
<td>Dysphagia, odynophagia</td>
<td>Mediastinal widening</td>
<td>Yes</td>
<td>MEU</td>
<td>Positive H/P</td>
<td>Improved</td>
</tr>
<tr>
<td>2</td>
<td>25/F</td>
<td>Dysphagia</td>
<td>Normal</td>
<td>-</td>
<td>Mass at mid esophagus</td>
<td>Positive H/P</td>
<td>Improved</td>
</tr>
<tr>
<td>3</td>
<td>70/F</td>
<td>Dysphagia</td>
<td>Normal</td>
<td>Yes</td>
<td>Mass at GE junction</td>
<td>-</td>
<td>Improved</td>
</tr>
<tr>
<td>4</td>
<td>35/M</td>
<td>Dysphagia, fever, weight loss</td>
<td>Pulmonary TB</td>
<td>-</td>
<td>MEU</td>
<td>Positive H/P</td>
<td>Improved</td>
</tr>
<tr>
<td>5</td>
<td>38/M</td>
<td>Dysphagia, fever, weight loss</td>
<td>Normal</td>
<td>-</td>
<td>MEU</td>
<td>Positive H/P</td>
<td>Improved</td>
</tr>
<tr>
<td>6</td>
<td>36/M</td>
<td>Dysphagia</td>
<td>Normal</td>
<td>Yes</td>
<td>MEU</td>
<td>Positive H/P (LN)</td>
<td>Improved</td>
</tr>
<tr>
<td>7</td>
<td>52/M</td>
<td>Dysphagia</td>
<td>Normal</td>
<td>Yes</td>
<td>MEU</td>
<td>Positive H/P</td>
<td>Improved</td>
</tr>
<tr>
<td>8</td>
<td>56/M</td>
<td>Hematemesis</td>
<td>Mediastinal mass</td>
<td>Yes</td>
<td>MEU</td>
<td>Positive H/P (LN)</td>
<td>Improved</td>
</tr>
<tr>
<td>9</td>
<td>42/M</td>
<td>Dysphagia</td>
<td>Normal</td>
<td>-</td>
<td>MEU</td>
<td>Tissue ZN +</td>
<td>Improved</td>
</tr>
<tr>
<td>10</td>
<td>28/M</td>
<td>Dysphagia</td>
<td>Normal</td>
<td>Yes</td>
<td>MEU</td>
<td>Positive H/P</td>
<td>Improved</td>
</tr>
<tr>
<td>11</td>
<td>32/F</td>
<td>Dysphagia</td>
<td>Normal</td>
<td>Yes</td>
<td>Submucosal tumor</td>
<td>Positive H/P</td>
<td>Improved</td>
</tr>
<tr>
<td>12</td>
<td>28/M</td>
<td>Dysphagia</td>
<td>Mediastinal mass</td>
<td>Yes</td>
<td>Mass at mid esophagus</td>
<td>Positive H/P</td>
<td>Improved</td>
</tr>
<tr>
<td>13</td>
<td>38/M</td>
<td>Dysphagia</td>
<td>Normal</td>
<td>-</td>
<td>Submucosal tumor</td>
<td>Positive tissue ZN</td>
<td>Improved</td>
</tr>
<tr>
<td>14</td>
<td>26/M</td>
<td>Cough while swallowing, fever and weight loss</td>
<td>Esophageal bronchial fistula</td>
<td>Yes</td>
<td>Fistulous opening at 26 cms</td>
<td>Positive H/P and ZN</td>
<td>Improved after surgery</td>
</tr>
</tbody>
</table>

Abbreviations used: MEU, mid esophageal ulcer; LNs, lymph nodes; H/P, histopathology; ZN, Ziehl-Neelsen staining for acid-fast bacilli
patients: one patient had pulmonary tuberculosis, and two had mediastinal widening. Barium swallow examination which was done in one patient showed evidence of esophagobronchial fistula (Figure 1) (patient 14). Chest CT scan revealed enlarged necrotic lymph nodes in the mediastinum (Figure 2) in 10 cases. The size of lymph nodes varied from 2 – 4 cms and number ranged from 4 to 6 in each patient. One patient had pulmonary tuberculosis. No patient had tuberculous focus in cervical lymph nodes, the spine or elsewhere.

**Table 2: Endoscopic abnormalities**

<table>
<thead>
<tr>
<th>Findings</th>
<th>Number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid-esophageal ulcer</td>
<td>08</td>
</tr>
<tr>
<td>Submucosal tumor</td>
<td>02</td>
</tr>
<tr>
<td>Mid-esophageal mass</td>
<td>02</td>
</tr>
<tr>
<td>Mass at GE junction</td>
<td>01</td>
</tr>
<tr>
<td>Esophagobronchial fistula</td>
<td>01</td>
</tr>
</tbody>
</table>

**Endoscopic findings**

Table 2 summarizes the endoscopic abnormalities. The endoscopic abnormalities were present in the middle third of the esophagus in 13 (92.6%) patients; one patient showed a mass lesion at the GE junction. Ulcers were solitary and ranged in size from 0.5 to 2 cms (Figure 3). Mass lesions were present in three patients: two in the mid-esophagus (patients 2 and 12) and one at gastroesophageal (GE) junction (patient 3). Their sizes varied from 2 to 3 cms and were polypoid or ulcerated occupying less than half of the lumen. Submucosal

**Figure 1:** A 26-year-man presented with cough while swallowing, fever and weight loss (case 14). (a) Barium swallow showing esophago-bronchial fistula in a case of esophageal tuberculosis; (b) endoscopic view showing an esophageal opening of the esophago-bronchial fistula, Note heaped up mucosa; and, (c) aspirate from fistula showing acid-fast bacilli by Ziehl-Neelson staining

**Figure 2:** CT chest showing enlarged necrotic mediastinal lymph nodes

**Figure 3:** A shallow linear ulcer in middle of the esophagus
lesions were located in mid esophagus, occupying less than half of the lumen.

**Histopathological and cytological findings (Table 3)**

Diagnosis of tuberculosis was confirmed by histopathology of esophageal lesions in 9 cases, FNAC of mediastinal lymph nodes in 2 cases and FNAC of esophageal lesion in 2 cases. One patient (patient 3) who had a mass lesion at GE junction had no histopathological evidence of tuberculosis. However, his chest CT scan revealed necrotic, enlarged lymph nodes and the diagnosis of esophageal tuberculosis was presumptive. Sputum examination for acid-fast bacilli was done in all patients; none was sputum positive.

**Treatment and outcome**

All patients received antituberculous therapy of four drugs- isoniazid, rifampicin, ethambutol and pyrizinamide for 3 months followed by isoniazid and rifampicin for 6 months. One patient developed hepatotoxicity due to antituberculous drugs and was put on modified antituberculous therapy comprising of ethambutol, ciprofloxacin and clarithromycin. After improvement in liver function tests four weeks later, sequential introduction of drugs was done. One patient who had a fistula underwent surgery.

On follow-up, all patients had weight gain and resolution of symptoms. Repeat EGD revealed healing of lesions in all cases. Post surgery barium swallow was normal in one patient who underwent fistulectomy.

**Discussion**

Esophageal tuberculosis is extremely rare entity that is found in an estimated 0.15% of patients who die of tuberculosis, 0.5% of all patients with persistent dysphagia and 1.3% of all patients having abnormal esophagoscopic findings (5). During a twelve-and-half-year period, we collected a total of 14 verified cases of esophageal tuberculosis constituting 2% of all cases who underwent EGD for persistent dysphagia and had mass- or ulcer-like lesion of the esophagus. Although isolated cases of primary esophageal tuberculosis have been reported, majority of cases are secondary to tuberculosis elsewhere (4-6). Tubercular involvement of esophagus usually occurs as a result of direct spread from adjacent mediastinal tuberculous lymphadenitis but it may also be caused by spread from local laryngeal or pharyngeal disease, reactivated pulmonary infection, broncho-esophageal fistula, infected vertebral bodies and some others (4-6).

Clinical, radiological and endoscopic features of esophageal tuberculosis are variable, diverse, nonspecific, and poorly described. Dysphagia was the most common presentation of esophageal tuberculosis (5-7). Other uncommon presentations included hematemesis and tracheoesophageal fistula (6-7). Since clinical, radiological and endoscopic features of esophageal tuberculosis may mimic esophageal carcinoma, tuberculosis as a causative factor for dysphagia should be considered in developing countries with high incidence of tuberculosis and in immunocompromised hosts. Furthermore, it should be kept in mind in differential diagnosis of ulcerohypertrophic lesions especially when repeated endoscopic biopsies reveal non-specific acute-on-chronic inflammation (8-9).

A variety of imaging tools such as chest radiography, barium esophagogram, and CT-chest have been used (4,5,10). Chest radiographic abnormalities though not characteristic of esophageal tuberculosis were suggestive of tubercular involvement of lung or spine and were noted in 65% of cases. Barium swallow showed extrinsic compression, traction diverticula, stricture, sinus/fistulous tracts, kinking...
and pseudo tumors in decreasing order of frequency (10). All these abnormalities were most commonly seen in the middle third of the esophagus. Radiological abnormalities seen in CT chest were present in 65% of cases and included mediastinal lymphadenopathy. The centre of enlarged mediastinal lymph nodes are typically hypodense in nearly half of the cases (10).

Endoscopic abnormalities seen in the esophagus are often non-specific and included shallow ulcers with or without undermined edges; other findings were sinuses or fistulous openings and mass lesions (2-7,8-9,11). The endoscopic findings seen in esophageal tuberculosis may mimic carcinoma in many cases. However, in the absence of typical histological features of tuberculosis at endoscopic biopsy, the absence of malignancy and presence of acute-on-chronic inflammation on repeated biopsies is suggestive of tuberculosis. Abnormal findings at endoscopic ultrasound had been described in recent reports (8,12). While the endoultrasound findings were not conclusive for tuberculosis and included heterogeneous or homogeneous hypoechoic masses in the esophageal wall, incrassation, interruption of esophageal adventitia, and mediastinal lymphadenitis. Most of the masses in the esophageal wall had hyperechoic spots and strips in the parenchyma (12). Endoultrasound offers opportunities for obtaining fine needle aspiration specimens for cytological and bacteriological diagnosis of tuberculosis.

Even with the extensive use of endoscopic and/or CT-guided aspiration biopsy and/or cytology, the diagnosis of esophageal tuberculosis remains elusive in many cases. In a series of 23 cases by Nagi et al the diagnosis was presumptive in 8 (34.8%) cases despite of employing endoscopic as well as CT-guided biopsy and/or aspiration cytology (5,10). In the present study the verified diagnosis of tuberculosis based on combination of histopathological, cytological and microbiological evidences was obtained in 92.8% of cases. This significant improvement in diagnostic yield in our series was largely because of combining these techniques repeatedly.

Patients showed excellent response to standard antituberculous treatment with complete resolution of lesions (4-5). Even patients of esophageal tuberculosis complicated by esophago-bronchial fistula or esophagomediastinal sinus were effectively and safely cured with antituberculous drugs alone (6). Deaths have been reported only in patients with severe co-morbidities and widespread tuberculosis.

In conclusion, the main presentation of esophageal tuberculosis in our series was dysphagia. The commonest endoscopic finding was a mid esophageal ulcer. Ten patients had associated mediastinal lymph node tuberculosis and one patient had active pulmonary tuberculosis. Histopathological proof of esophageal tuberculosis was present in majority (92.3%) of cases and response to treatment was excellent.

References