

## Esophageal Candidiasis and Its Radiological Diagnosis

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**Abstract** Clinical features and radiological findings were reported in four patients with esophageal candidiasis. These primary diseases were malignant lymphoma, malignant thymoma, systemic lupus erythematosus (SLE) and lung cancer after operation. Definite diagnosis were made at endoscopic biopsy and incubation of mucosa or mucosal secretion. Endoscopic findings were observed multiple white patches or plaques. Radiological findings were demonstrated in all cases as follows; a) small filling defect, b) small indentation and protrusion, c) longitudinal fold disturbance, d) irregular mucosal outline, e) coating of contrast medium. The radiological diagnosis of esophageal candidiasis by barium swallow has proven to be of considerable value.

**Key Words** : Esophageal Candidiasis, Esophageal Moniliasis, *Candida albicans*, Radiological Diagnosis

### Introduction

Esophageal candidiasis is an infection by the fungi of the genus *Candida*, the mouth and pharynx being the usual sites of affection. Severe infections with *Candida albicans* have become more common in recent years. This has been ascribed to the increased use of radiation therapy, anticancer drugs, cortisone and antibiotics.<sup>1)2)</sup> The occurrence of esophageal candidiasis in AIDS (acquired immune deficiency syndrom) has been the object of considerable interest in the United States.<sup>3)4)</sup> Monilial esophagitis was first reported by Veron in 1835<sup>5)</sup> and radiological appearances were first demonstrated by L. Andren & D. Theander in 1956.<sup>6)</sup>

Over 100 cases of esophageal candidiasis have been reported in the world literature. However, literature which deals with detailed radiological findings is scant.

The purpose of this study is to evaluate radiological diagnosis of esophageal can-

didiasis.

### Materials and Methods

Four patients with 3 malignant diseases or SLE were enrolled in the study. Among these patients, one case (Case4) had two episodes.

Age, sex, primary disease, treatment given for primary disease, subjective symptom, definite diagnosis of *Candida albicans*, treatment given for esophageal candidiasis and outcome are given in Table 1.

Histological sections from all endoscopic esophageal biopsies were stained with PAS and examined for fungi. The diagnosis of candidiasis was made by means of endoscopy in all cases, and at the same time the fluoroscopy was done.

The radiological findings were investigated before and after treatment given for esophageal candidiasis.

Table 1. Clinical Feature

Case Number	Age Sex	Primary disease	Treatment given for primary disease	Symptom	Candida albicans	Treatment given for candidiasis	Outcome
1	65 F	Malignant lymphoma	Radiation, Cortisone Anticancer drug	Dysphagia Pharyngeal pain	Biopsy (-) Esophageal mucosa (+)	Radiation stopped Nystatine	died
2	58 M	Malignant thymoma	Radiation	Stenotic sensation	Biopsy (+)	Radiation stopped	recovered
3	36 F	SLE	Cortisone	Dysphagia	Biopsy (-) Esophageal mucosa (+)	Cortistne stopped	recovered
4	76 M	Lung cancer after operation	Antibiotics	Dysphagia Chest pain	Biopsy (+)	Fluconazone	recovered

Table 2. Roentgenographic Findings

	Case 1	Case 2	Case 3	Case 4
Distribution	localised (Ce-Iu)	localised (Im)	extensive	extensive
Organic changes				
Irregular mucosal outline	+	+	+	+
Small filling defect	+	+	+	+
Small indentation & protrusion	+	+	+	+
Deep ulcer formation	-	-	-	-
Longitudinal fold disturbance	+	+	+	+
Narrowing of the esophagus	+	-	+	-
Functional changes				
Absence of peristalsis	-	+	+	-
Coating of contrast medium	+	+	+	+

+ : visualized - : not shown

Ce: Cervical portion

Iu: Upper intra-thoracic portion

Im: Middle intra-thoracic portion

## Results

Dysphagia was the most common symptom. The patient complained of rather sudden onset of symptoms, and symptoms may progress rapidly. Definite diagnosis was made at endoscopical biopsy and incubation of mucosa and secretion.

Two of these took oral medications of Nystatine and Fluconazone. The radiation therapy or cortisone therapy (predonine) was stopped in 3 patients. Only one patient (Case 1) did not response to treatment and died. But other patients were allowed to recover.

Radiological findings and distribution of the lesion were reported in Table 2. Coating of contrast medium as functional changes,

and irregular mucosal outline, small filling defect and longitudinal fold disturbance were demonstrated in all cases. But no deep ulcer formation was shown. After treatment, above-mentioned radiological findings disappeared except for Case 1 who was died. Roentgenogram in all cases are demonstrated. (Fig 1, 2, 3, 4).

## Discussion

Esophageal candidiasis is rare condition. Candidiasis, in general, is most commonly seen in infants and is usually by *Candida albicans*. In adults, esophageal candidiasis is less common.<sup>7)</sup> When host resistance is lowered by disease or immunosuppressive drugs, or if the normal flora is altered by use of anti-

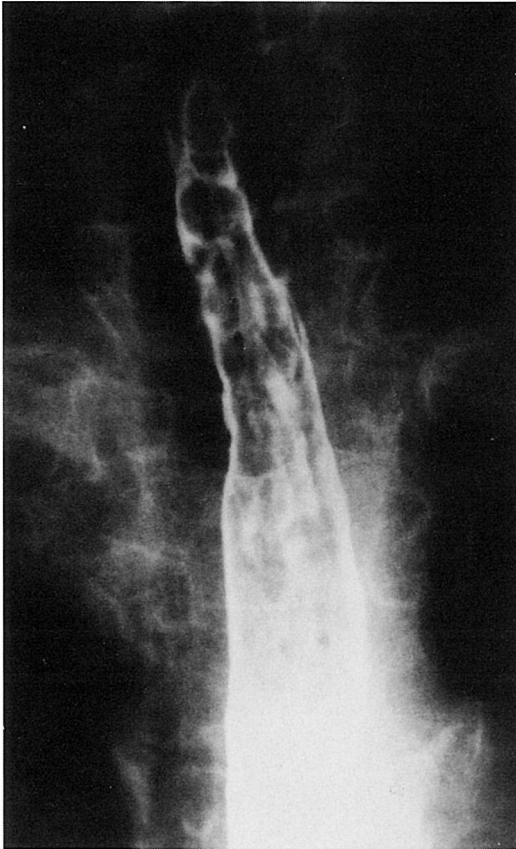


Fig. 1 Double contrast study shows narrowing and longitudinal fold disturbance in cervical esophagus. (Case 1)

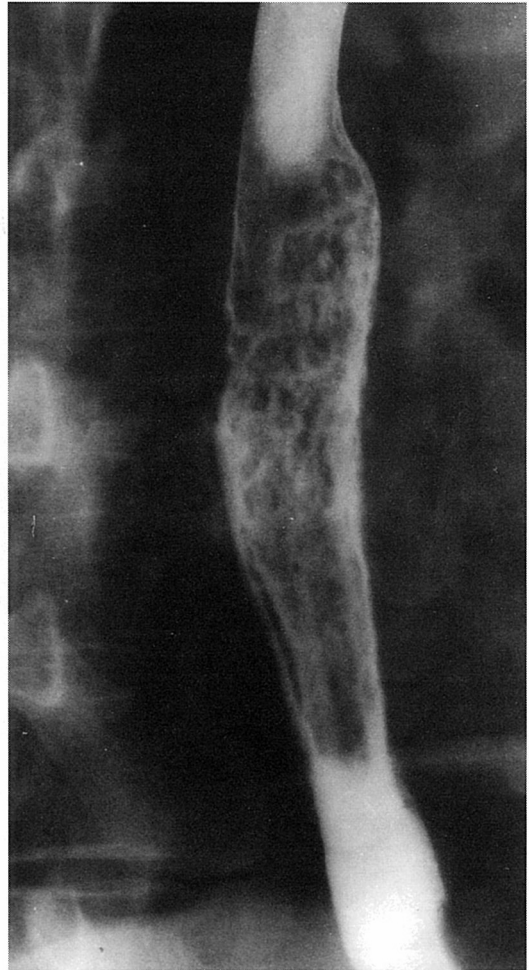


Fig. 2 Double contrast study shows irregular mucosal outline and nodular indentations & protrusion in middle intra-thoracic portion. (Case 2)

cancer drugs or broad-spectrum antibiotics, infection may occur.

It has been customary to use the "Moniliasis" when referring to infection caused by the yeast-like fungus of the genus *Candida*. The term "Moniliasis" is in fact a misnomer, for *Monilia* is genus properly used for the fungi which cause brown rot of fruit. Hence the term "Candidiasis" is preferable.<sup>8)</sup>

Since esophageal white patches or plaques may suggest the possibility of candidiasis at endoscopy and definite diagnosis is made at endoscopical biopsies, endoscopy is most useful in diagnosis. B. B. Scott reported that radiology was not helpful in diagnosis.<sup>9)</sup>

Since endoscopic examination may be unwise in patients suffering from terminal disease or severe debility, fluoroscopy is of

particular diagnostic importance.

The radiological appearances vary with the stage of the disease like the clinical findings.<sup>10)</sup> In esophageal functional changes, motility may be abnormal, with irritability or spasticity, and absence of peristalsis in the late stage. The first radiological changes may be a granular, slightly irregular appearance to mucosa. An irregular esophageal outline, often containing a myriad of small filling defects, reflects destruction of the mucous membrane. Before ulceration, there may be nodular indentations from edema, causing a

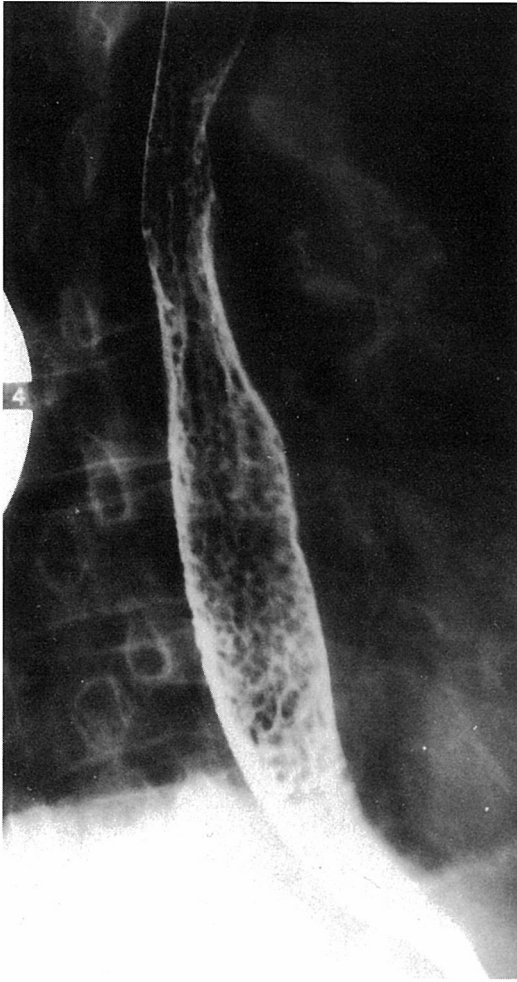


Fig. 3 Double contrast study shows cobblestone appearance and irregular mucosal outline. (Case 3)

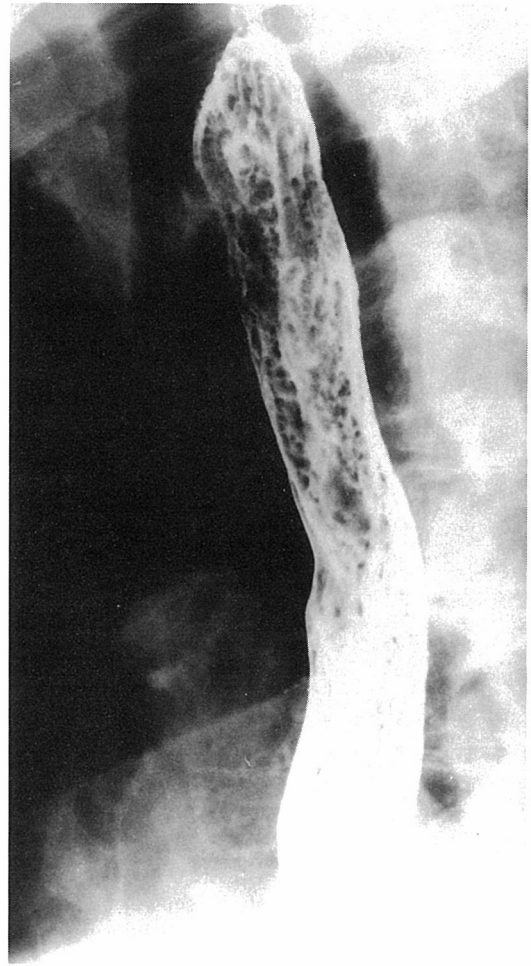


Fig. 4 Double contrast study shows cobblestone appearance and coating of contrast medium. (Case 4)

cobblestone appearance. In the developed disease, the esophagus appears grossly shaggy from marked edema of the submucosa and deep ulceration, and marked narrowing of the lumen of the esophagus occurs. Longitudinal folds are usually still seen early but later they are disrupted.<sup>10)11)12)</sup>

R. T. Kobayashi et al. reported radiographic abnormalities were noted in six out of eight instances (75%) of proven esophagitis and these changes were often subtle without the classic cobblestoning or ulcerations (small indentation and protrusion).<sup>13)</sup>

These results have been discussed in rela-

tion to the findings of other investigations in this field.

The differential diagnosis includes peptic esophagitis, tuberculosis, syphilis, Crohn's disease, esophageal varices or carcinoma.

The differential diagnosis in the radiologic search for candidiasis usually does not cause any difficulties. But a granular, slightly irregular appearance to mucosa, as caused by peptic esophagitis, tuberculosis or syphilis, are not differentiated from candidiasis in the early stage. Tortuosity of the folds and air bubbles, as caused by varices, are differentiated from candidiasis by proof of small

filling defect without swelling folds. Small indentation and protrusion in candidiasis are similar to cobblestone appearance in Crohn's disease. Marked narrowing of the lumen of the esophagus, as caused by esophageal carcinoma, are differentiated from candidiasis in the late stage because of the sharply-defined segmental border of the tumor and the rigidity without peristalsis.

Four patients with esophageal candidiasis were reported, and radiological findings of the esophagus were demonstrated.

The radiological diagnosis has proven to be of considerable value.

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