

# State-of-the-Art Barium Examination in Opportunistic Esophagitis

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*This report presents a comparison of state-of-the-art esophagography and endoscopy in the diagnosis of pathologically proven esophagitis. The modern multiphasic esophagogram is shown to have a sensitivity of 92% for the detection of opportunistic esophagitis in the immunocompromised patient. State-of-the-art esophagography provides a sensitive and inexpensive method for investigating patients in whom opportunistic esophagitis is suspected and for monitoring their response to therapy.*

Opportunistic esophagitis has become an increasingly recognized clinical entity due to the lengthened life-span of immunocompromised patients with chronic debilitating diseases or underlying malignancies and the increasing use of immunosuppressive drugs. In view of the reported high incidence of false negative barium studies, it has been suggested that endoscopy is the study of choice in such patients (1, 2). The modern multiphasic barium examination (3) was not employed in the literature cited to evaluate the efficacy of the esophagogram (4-6). We therefore undertook an analysis of all pathologically proven cases of opportunistic esophagitis evaluated by state-of-the-art esophagography to determine if the change in technique had improved the radiologic detection of opportunistic esophagitis.

## MATERIALS AND METHODS

Thirty-eight cases of opportunistic esophageal infection were coded in the Methodist Hospital pathology file

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during the time period January 1, 1979, to October 1, 1984. Eighteen of these had esophagography within seven days (mean four days) of endoscopic biopsy. These 18 cases form the basis of this report. The authors reviewed the original radiologist's report, the esophagograms, and the patient's chart. No cases other than those revealed by a search of the pathology files were included in order to ensure that the cases were not selected on the basis of positive radiographic findings. In all instances, the radiologist had no knowledge of the endoscopic or pathologic findings prior to his study.

Details of the esophagogram technique have been described elsewhere (3). Briefly, it consists of a multiphasic approach using a double-contrast technique for luminal surface evaluation, fluoroscopic assessment of motility, a mucosal relief film for evaluation of fold thickness, and a single contrast phase for evaluation of esophageal distensibility. A barium tablet is given routinely to patients complaining of dysphagia unless a high-grade obstructing lesion is identified.

## RESULTS

The modern multiphasic esophagogram was positive in 17 of 18 patients in the detection of opportunistic esophagitis. The results as originally interpreted by the radiologist are summarized in Table 1. All diagnoses were confirmed by the presence of fungal mycelia on direct smear or by cytology or by tissue invasion on mucosal biopsy. In all cases, radiologic evaluation was done prior to endoscopy and biopsy except for one patient with achalasia in whom endoscopy was initially performed.

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TABLE I. RESULT OF ORIGINAL RADIOLOGIC INTERPRETATION OF 18 CASES OF OPPORTUNISTIC ESOPHAGITIS

	<i>Number of cases</i>	<i>True positive</i>	<i>False negative</i>
<i>Candida</i> —Group A	10	10	0
<i>Candida</i> —Group B	5	5	0
Herpes	2	1	1
Herpes and <i>Candida</i>	1	1	0
Totals	18	17	1

In our patient population, patients with opportunistic esophagitis, particularly candidiasis, can be arbitrarily categorized into two groups. The first group consisted of 11 immunocompromised cases, 10 with candidiasis and one presented histologic evidence of both *Candida* and herpetic esophagitis. Figure 1 demonstrates the characteristic radiographic features. The five patients in the second group presented no evidence of compromised immunity, but each had *Candida* infection proximal to an obstructing lesion.

In one patient in group two a tube double-contrast esophagogram showed plaquelike defects suggestive of *Candida* superimposed on achalasia (Figure 2). This patient had initial endoscopy which did not visualize the esophageal lumen adequately because of retained fluid in the dilated esophagus. This is the only patient in whom endoscopy was the initial study, and one of two patients where the two diagnostic examinations did not correlate. However, repeat endoscopy and biopsy following the esophagogram confirmed the diagnosis. Two other patients had pathologically documented herpetic esophagitis without evidence of superimposed *Candida* esophagitis.

## DISCUSSION

With the increasing number of immunocompromised hosts, patients with *Candida* esophagitis are encountered more often today in clinical practice. Some reports (1, 2) state that the barium esophagogram is not a sensitive examination for the diagnosis of opportunistic infections. Based on studies done between 1968 and 1976 primarily utilizing fluoroscopy and the single contrast esophagogram (4–6), the incidence of false negative barium studies in patients with documented *Candida* esophagitis has been estimated to be approximately 20–60%. These reports of the low sensitivity of the barium esophagogram served as the

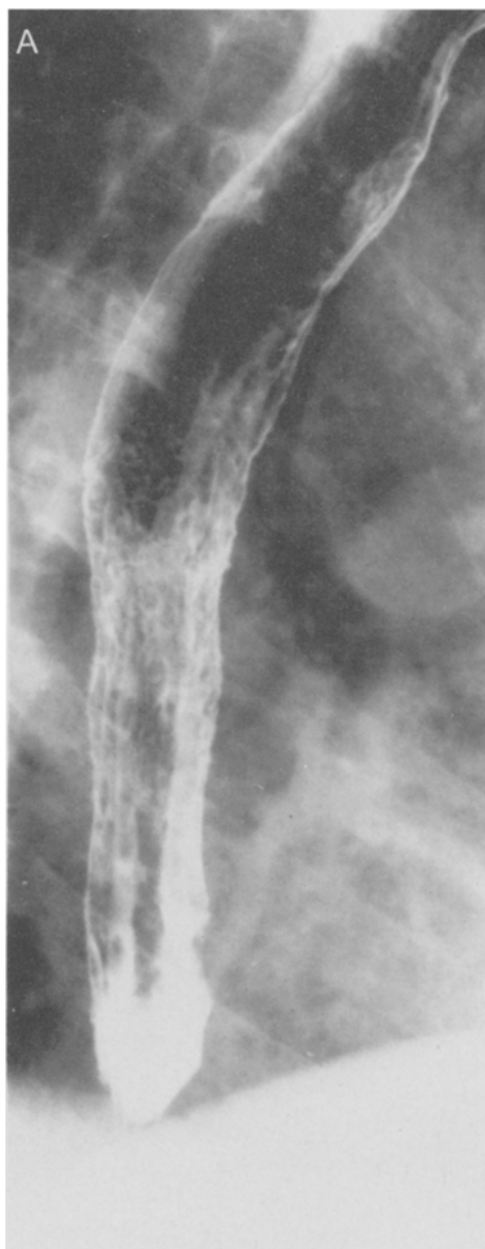


Fig 1. Double-contrast esophagograms of two immunocompromised patients with pathologically proven *Candida* esophagitis. (A) The classic appearance of multiple elevated plaques, nodularity, and ulcerations is seen in the mid and lower esophagus. (B) "Snake skin" appearance of multiple nodular monilial plaques.

rationale for the use of endoscopy as the initial diagnostic study (1, 2).

Using the modern multiphasic esophagogram (3), our results indicate that it is a far more sensitive examination than previous techniques for the detection of opportunistic esophagitis. In 11 cases of

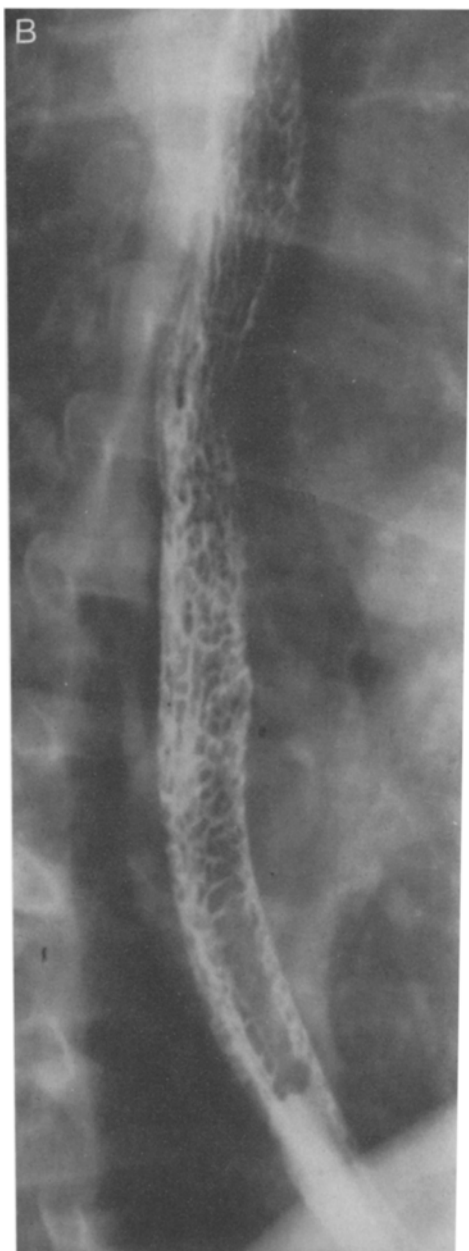


Fig 1. Continued.

immunocompromised patients with *Candida* esophagitis, all were reported to have an esophagogram consistent with opportunistic esophagitis. Reviewing the radiographs, the striking overall impression was that the radiographic findings, particularly on the double-contrast views, were markedly abnormal.

Ten of the 11 immunocompromised patients with *Candida* esophagitis had the classic x-ray features of candidiasis which include a combination of prom-



Fig 2. Tube esophagogram of patient with achalasia who had had a recent endoscopy which did not visualize the plaques because of retained fluid. Scattered small plaquelike defects are demonstrated by double contrast radiography. Repeat endoscopy with biopsy confirmed *Candida* esophagitis.

inent plaquelike defects, nodularity, and erosions or ulcerations (Figures 1 and 2). The remaining patient demonstrated diffuse spasm. Abnormal motility is a well-documented but less specific radiographic finding in patients with *Candida* esophagitis. Two of the three patients with herpetic esophagitis (one of whom was found to have concomitant candidiasis)

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had thick folds and scattered erosions. One of these two patients also demonstrated multiple elevated plaques. Of the 13 immunocompromised patients with opportunistic esophagitis (herpetic and *Candida*), only one was interpreted as normal, indicating a sensitivity of 92%. The single false negative examination occurred in a patient who proved to have herpetic esophagitis on biopsy. In retrospect, subtle evidence of small plaquelike defects were believed to be present. This case emphasizes that the radiologist must have an increased index of suspicion for subtle changes which may indicate opportunistic infection.

We attribute the increase in sensitivity of diagnosing opportunistic esophagitis to the routine use of a combination of double-contrast views, single-contrast views with motility assessment, and mucosal relief radiographs (3). Other investigators, who primarily rely on the use of the double-contrast technique, have achieved a sensitivity of 88% (7).

Esophageal candidiasis, although classically associated with immunocompromised patients, does occur in patients with mechanical or functional obstruction (8). Signs of opportunistic infection proximal to an obstruction can be a diagnostic problem. In our data, five patients (group two) had candidiasis proximal to an obstruction. In all cases the esophagogram clearly demonstrated the level and severity of the obstruction. We found that evacuating retained secretions and debris, prior to the esophagogram, is very helpful for obtaining a better view of the mucosa and of the underlying obstruction (Figure 2).

Our understanding of the radiographic manifestations of opportunistic esophagitis has undergone significant refinement with the advent of double-contrast esophagography. Advanced herpetic esophagitis can appear identical to *Candida* esophagitis with typical plaquelike lesions and ulcers. We find that the presence of ulcers on a normal mucosal background is highly suggestive of herpetic esophagitis (9). If the double-contrast esophagogram shows multiple plaques and ulcers, it indicates an opportunistic esophagitis; this is usually secondary to *Monilia* but can be mimicked by herpetic infection. In such patients, correlation of the clinical story, response to Nystatin, and radiography is reasonable. If the radiographic appearance suggests

herpetic esophagitis, endoscopy should be done to confirm the diagnosis and exclude moniliasis.

Our sensitivity of 92% in the radiographic detection of opportunistic esophagitis challenges the recent clinical reports stating that barium radiographic studies are not sensitive for the diagnosis of esophageal moniliasis (1, 2, 10). We attribute our increased sensitivity to a thorough multiphasic approach in barium esophagography. This has also increased early diagnosis of less severe forms of reflux esophagitis (3). Although the number of patients is small, our experience suggests that a state-of-the-art esophagogram can be used as a highly sensitive examination for the diagnosis of opportunistic esophageal infections and as an inexpensive method for monitoring response to therapy. Patients who fail to respond to therapy should undergo endoscopy for histologic confirmation. We believe this provides a reasonable approach in the majority of cases of immunocompromised patients presenting with esophageal symptoms when opportunistic esophagitis is suspected.

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