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Radiologic Evaluation of Small Esophageal Carcinoma

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Abstract. Eleven patients with small esophageal carcinomas are described. Double-contrast esophagography is essential in the detection of small esophageal tumors. In spite of the "early" detection, we did not find an improvement in survival in these patients.

Key words: Esophagus, cancer, small – Double contrast, esophageal cancer.

The mortality and morbidity associated with carcinoma of the esophagus is very high; a survey by the National Cancer Institute showed only 4% of patients surviving 5 years after diagnosis [1]. This poor survival rate appears to be related to the late discovery of the tumor. In Pearson's series of almost 2000 cases, only 20% of patients had localized disease at the time treatment was started [2].

Itai et al. [3], Suzuki et al. [4], and Yamada et al. [5] advocate detailed and precise examination of the esophagus by double-contrast methods in order to detect small lesions in asymptomatic patients. Suzuki [4] and Koehler [6] and their coworkers reported an improvement in the overall survival rate in patients with small forms of esophageal carcinoma. This report presents our experience in 11 patients with small esophageal carcinomas. Particular attention is directed to the radiologic appearance, the predisposing factors, and the survival rate.

Clinical Material and Methods

Eleven patients with small esophageal carcinomas were identified over a period of 4 years (1974–1978) at out institution. Only patients with lesions 3.5 cm or less in length and involving only a portion of the esophageal circumference were included [6].

Of the 11 patients, three were female and eight were male. Their ages ranged from 47 to 71 years, with a median of 59.1 years. Nine of the patients were heavy smokers, six regular alcohol users, and four had had a previous squamous cell carcinoma of the head and neck (hypopharynx, retromolar trigone, tongue, and tonsil). Three patients complained of dysphagia, two had symptoms of epigastric fullness, one presented with a mass in the neck, and five were asymptomatic.

The patients were all examined with fluoroscopy and spot films in multiple projections to best display the anatomic configuration of the lesion. Radiographs were also obtained in most of the patients utilizing double-contrast techniques previously described [7].

Results

The pertinent clinical and radiological features are summarized in Tables 1 and 2.

The esophageal lesions in all but one patient (who had carcinosarcoma) were proven to be squamous cell carcinoma by endoscopy and biopsy. All lesions were localized in the thoracic esophagus; nine in the mid-third and one each in the upper and lower third. The size of the tumor ranged from 0.8 to 3.5 cm as measured on radiographs obtained on remote control devices with a 36-inch tube-film distance. Two patients (cases 1 and 3) presented with metastatic disease to the lung and peripancreatic region, respectively, prior to the discovery of the asymptomatic esophageal neoplasms. Two patients were treated with high-dose radiation therapy and surgery, seven with radiation therapy alone, and one with radiation therapy and chemotherapy.

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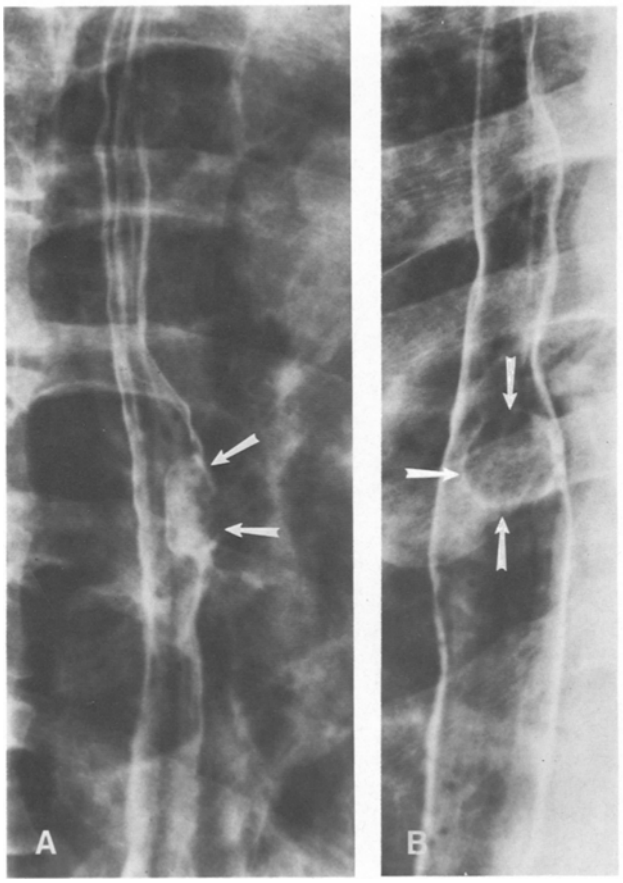

Fig. 1 A and B. *Case 3.* Squamous cell carcinoma of the esophagus in an asymptomatic patient. **A** Double-contrast esophagogram demonstrating a 2 cm polypoid mass (*arrows*). **B** The same lesion seen *en face*

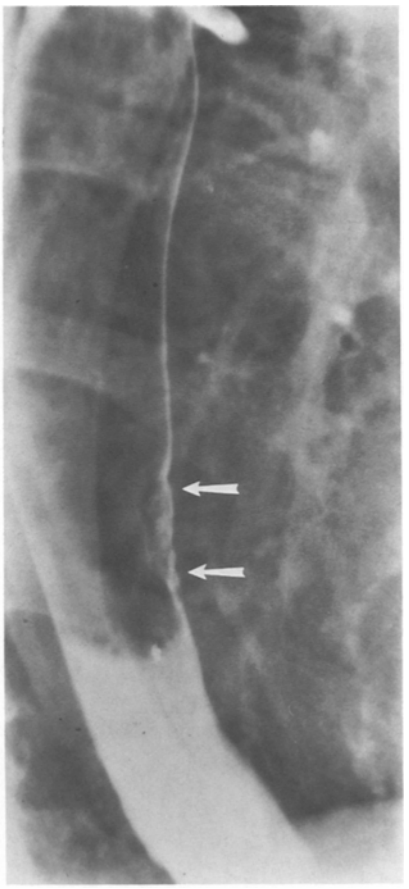

Fig. 2. *Case 8.* Double-contrast esophagography shows a 1 cm plaque-like filling defect involving one wall of the esophagus (*arrows*)

Of the 11 cases, two were excluded in determining the average survival. One of these patients died of a myocardial infarction 5 months after treatment. In the other patient, even though a small lesion was defined radiologically, no treatment was started. A year later this patient presented with a large tumor and survived about an additional 3 months. Of the nine patients whose deaths were related to their small esophageal carcinomas, the survival ranged from 6 to 17 months, with an average of 12.5 months. All the deaths were directly related to metastatic disease from the esophageal carcinoma except in the patient with the myocardial infarction.

Three different radiological appearances were noted in the 11 cases. All lesions were sessile. Three lesions presented as polypoid masses, ranging in size from 0.8 to 3.5 cm. The contours of the polypoid masses were generally smooth with no ulcers identified, and when seen *en face,* resembled polyps in the colon (Fig. 1). Three lesions appeared as plaque-like filling defects along one contour of the esophagus and were without discrete focal ulceration (Fig. 2). At fluoroscopy, the esophageal wall appeared rigid in those areas and when seen in other than tangential projections, the plaques could be readily overlooked, appearing as vague filling defects or shaggy folds (Fig. 3). Five cases demonstrating similar plaque-like filling defects had focal areas of ulceration, the ulcers varying from a tiny crater to almost complete denudation of the surface of the tumor (Fig. 4).

Discussion

Whether the discovery of small, localized carcinomas results in an improved overall survival would still appear to be debatable. Morton [8] reported a relationship between the vertical length of the tumor and nodal spread; if the length was less than 5 cm, 50% of the patients developed nodal metastases, but if

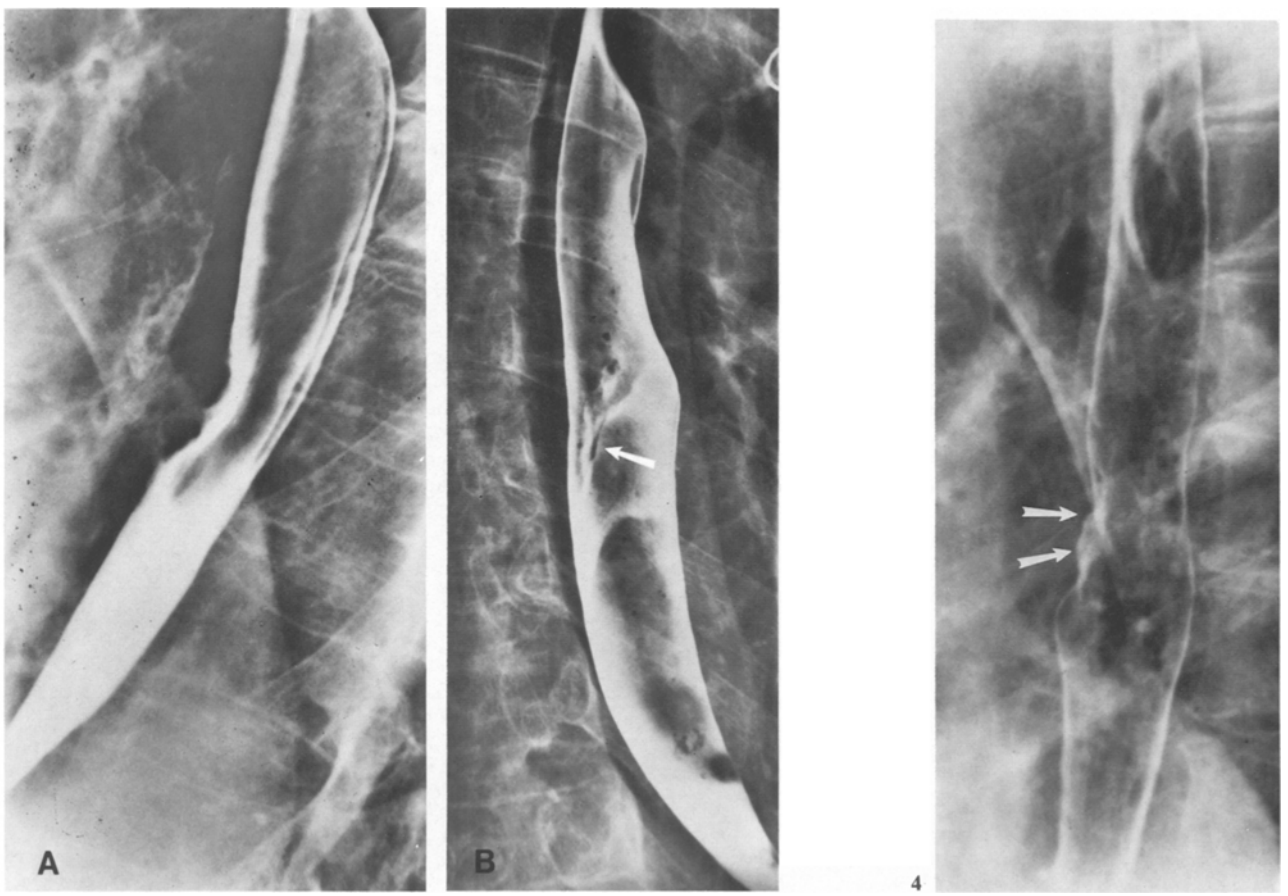

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Fig. 3. *Case 4.* **A** Double-contrast study defines a 1.7 cm irregular plaque-like carcinoma along anterior wall of the esophagus. **B** In a different projection only a granular shadow can be identified (*arrow*)

Fig. 4. *Case 1.* Double-contrast esophagogram demonstrates a markedly irregular wall with central ulceration (*arrows*)

it was greater than 5 cm, 90% had nodal metastases. Koehler et al. [6] reported that four of six patients with small esophageal cancers lived 2 years or more after therapy, and three of four were free of recurrence. In Palmer's series [9] a group of patients described as having ideally "early" esophageal carcinomas survived an average of 13.1 months after the tumor was discovered. Our series shows, despite the small size of the lesions and the lack of symptoms in some patients, an average survival of only 12.5 months. Further studies are needed to determine whether the detection of small lesions improves the survival rate and if the so-called small esophageal lesions truly represent "early forms of esophageal carcinoma."

Conventional esophagography has been found to be an adequate screening procedure for detection of various esophageal diseases, but not for accurate diagnosis of small carcinomas [10]. The double-contrast technique has proven to be superior to the conventional study in our hands [7], as well as in those of other authors [3–6].

A number of predisposing factors in the development of carcinoma of the esophagus have been reported [11–20]. In particular, studies have shown that tobacco and heavy alcohol intake are associated with an increased risk of squamous cell carcinoma of the respiratory and upper alimentary tracts (lips, tongue, pharynx, larynx, and esophagus) [14–16]. Nine of our patients had a long-standing history of excessive tobacco use, and six of excessive alcohol consumption. There is also an increased risk of carcinoma of the esophagus in those patients with head and neck tumor [11–13]; four patients in our series had a previous history of such tumors. Since there appears to be a relationship between these two types of primary tumors, the examination of the esophagus when patients present with head and neck malignancies may lead to the detection of small, potentially curable carcinomas of the esophagus.

Table 1. Clinical data on 11 patients with small esophageal carcinoma

Case No.	Age (years)	Sex	Symptoms	Predisposing factors	Pathological diagnosis
1	47	M	None	Heavy smoker and alcohol user	Squamous cell carcinoma
2	59	F	Dysphagia for 3 weeks	Heavy smoker	Squamous cell carcinoma
3	52	M	None	Heavy smoker	Squamous cell carcinoma
4	63	M	None	Heavy smoker and alcohol user; carcinoma retromolar space	Squamous cell carcinoma
5	66	M	Epigastric fullness	Heavy smoker	Carcinosarcoma
6	71	M	None	Tonsillar tumor	Squamous cell carcinoma
7	58	M	Epigastric fullness	None	Squamous cell carcinoma
8	61	M	None	Heavy smoker and alcohol user; pharyngeal carcinoma	Squamous cell carcinoma
9	70	M	Choking sensation	Heavy smoker and alcohol user; carcinoma of the tongue	Squamous cell carcinoma
10	56	F	Neck mass	Heavy smoker and alcohol user	Squamous cell carcinoma
11	48	F	Difficulty in swallowing	Heavy smoker and alcohol user	Squamous cell carcinoma

Table 2. Radiological data on esophageal carcinoma

Case No.	Length of tumor (cm)	Radiologic appearance	Location	Treatment	Survival (months)	Cause of death
1	1.5	Plaque with ulceration	Mid-thoracic	Radiation	9	Metastatic carcinoma
2	3	Irregular plaque	Mid-thoracic	Preoperative radiation; surgery	17	Metastatic carcinoma
3	2	Sessile polyp	Mid-thoracic	Radiation	15	Metastatic carcinoma
4	1.7	Plaque with ulceration	Mid-thoracic	Radiation	6	Metastatic carcinoma
5	3.5	Sessile polyp	Mid-thoracic	Preoperative radiation; surgery	15	Metastatic carcinoma
6	0.8	Sessile polyp	Mid-thoracic	Radiation	3	No treatment of early lesion; metastatic carcinoma
7	2	Irregular plaque	Mid-thoracic	Surgery	13	Metastatic carcinoma
8	1	Irregular plaque	Distal thoracic	Radiation	5	Myocardial infarction
9	2	Plaque with ulceration	Mid-thoracic	Radiation	7	Metastatic carcinoma
10	1.5	Plaque with ulceration	Mid-thoracic	Radiation	16	Metastatic carcinoma
11	2	Plaque and ulceration	Upper thoracic	Radiation; chemotherapy	15	Metastatic carcinoma

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