

Air in the Oesophagus: A Sign of Oesophageal Involvement in Systemic Sclerosis

A. OLIVÉ, S. JUNCOSA*, G. EVISON**, P.J. MADDISON***

Summary An air oesophagogram, defined as a column of air involving the entire oesophagus, seen on a lateral chest X-ray was observed in 6 (20%) of 30 consecutive patients with systemic sclerosis (SSc) but in none of the controls. The presence of this sign was unrelated to the clinical subset of SSc and to age but was associated with the symptom of regurgitation.

Key words Systemic Sclerosis, Oesophagus, Air Oesophagogram.

INTRODUCTION

Oesophageal involvement is a major feature of systemic sclerosis (SSc). Clinical symptoms include dysphagia, heartburn and regurgitation (1). The radiological manifestations of SSc involving the oesophagus have been extensively described (2). We would like, however, to draw attention to the presence of air in the oesophagus as a sign of oesophageal involvement in SSc.

The aim of this study was to analyse the frequency of an air oesophagogram in a SSc population, and to relate this to clinical subsets of SSc and to the presence of particular symptoms.

METHODS

A lateral chest X-ray was performed on 30 consecutive patients with SS attending the Connective Tissue Disease Clinic at the Royal National Hospital for Rheumatic Diseases. Thirty controls were selected and matched with the SS patients. A single radiologist examined the 60 X-rays without being aware of the identity or clinical features of the patient. The presence of air in the oesophagus was defined as a column of air involving the entire oesophagus. This did not include segmental collections of air. (Fig. 1).

The SSc patients were classified according to recent criteria into diffuse SSc and limited SSc (3). Controls patients included rheumatoid arthritis in 14 (47%), osteoarthritis in 3 (10%); the remaining 13 (43%) had other diseases less likely than SSc to involve the oesophagus.

Symptoms of oesophageal involvement including: heartburn (time, intensity and frequency), dysphagia (solids or liquids, intensity and frequency) and regurgitation (intensity and frequency) were assessed and related to the presence of an air oesophagogram.

Statistical methods used included: the X^2 test, the Mc Nemar test (and its 95% confidence interval) and the T-test for independent and for paired means.

RESULTS

The cases and controls were predominantly female with only two males in each group. Patients with SSc had a mean age of 62.3 years (SD 8.7) (range 39-78). Eight of the SSc patients had limited SSc (27%) while the rest had diffuse SSc. Twenty-two patients (73%) were symptomatic. Heartburn was the most frequent symptom (60%), followed by dysphagia (47%) and regurgitation (27%). The frequency of these symptoms can be seen on Table 1. Regurgitation occurred during the day in 61% and during the night in 44% of the patients. In those patients who had difficulty in swallowing, dysphagia for solids occurred in 93% and for liquids in 7%.

The mean age of the control group was 64.5 (SD 8.3) (range 46-77) years. There were no significant differences in sex and age between the SSc cases and controls.

Figure 2 shows the chest X-ray findings in the SSc and control groups. Six (20%) of the SSc patients but none of the controls showed an air oesophagogram (Mc Nemar Test = 6.0; 1 d.f.; $p < 0.02$). The 95% confidence interval for the difference between their proportion was 4% and 36%. Segmental collections of air (skip involvement) were seen in the same proportion of SSc cases and controls.

The presence of an air oesophagogram on the lateral X-ray was not influenced by the clinical subset of sys-

Hospital Universitario Germans Trias i Pujol, Barcelona, Spain, *Institut Catalán de la Salut, **Royal United Hospital, Bath, UK, *** Royal National Hospital for Rheumatic Diseases, Bath, UK.



Fig 1: Chest X-ray: air oesophagogram in a patient with systemic sclerosis. Note the entire column of air.

temic sclerosis. Although all the SSc patients with a positive oesophagogram had symptoms, the difference in the frequency of symptoms between those with and those without this radiological feature was not significant. With respect to individual symptoms, there was a significant ($p < 0.05$) association between an air oesophagogram and regurgitation. Fifty per cent of the patients with regurgitation had an air oesophagogram compared with

only 9% without regurgitation. There was no relationship with other symptoms.

The clinical subset of SSc was not related to the presence or absence of particular oesophageal symptoms. Although patients with limited SSc suffered more frequently from heartburn (87%) than those with diffuse SSc (50%), the difference was not significant.

DISCUSSION

In normal individuals the empty oesophagus is a collapsed cavity, thus the lateral chest film does not show air in the oesophagus. In systemic sclerosis because of the smooth muscle atrophy and fibrosis, there is no collapse of the oesophageal walls and the lumen remains filled with air (4). The air oesophagogram has been observed in achalasia, laryngectomized patients who practice oesophageal speech and also after thoracic surgery (2,4). The presence of an air oesophagogram as a sign of SSc was originally described by Dinsmore et al. (2). Seventy-five per cent of their patients had an air oesophagogram, although they included "skip" involvement (2). These authors suggested that air in the oesophagus correlated with pulmonary involvement, specifically interstitial fibrosis (2). Martinez (5), on the other hand, believes that the air oesophagogram is not related to fibrosis. He argues that other conditions with interstitial fibrosis of the lung do not show this finding. Interestingly enough, in one of the patients in his report the oesophageal symptoms preceded the skin involvement (5). House et al. examined 24 patients with SSc and only 12.5% of their patients had an air oesophagogram. They considered a positive air oesophagogram only if an entire column of air occupied the thoracic oesophagus (6). In our study which is similar methodologically to that of House, 20% of the patients had an air oesophagogram. This appears to be due to oesophageal involvement by SSc irrespective of other clinical features. Furthermore, it is not a feature of age per se. Most patients with this radiological finding had oesophageal symptoms but regurgitation appeared to be the manifestation most associated with this feature.

Table I: Frequency of oesophageal symptoms in SSc patients.

Clinical Feature	SSc		
	All (30)	Limited (8)	Diffuse (22)
Heartburn	18(60%)	7(87%)	11(50%)
Dysphagia	14(47%)	5(62%)	9(41%)
Regurgitation	8(27%)	0	8(36%)
Asymptomatic	8(27%)	1(12%)	7(32%)
Air oesophagogram	6(20%)	2(25%)	4(18%)

Acknowledgement: I would like to thank Mrs Trish Myers for typing the manuscript.

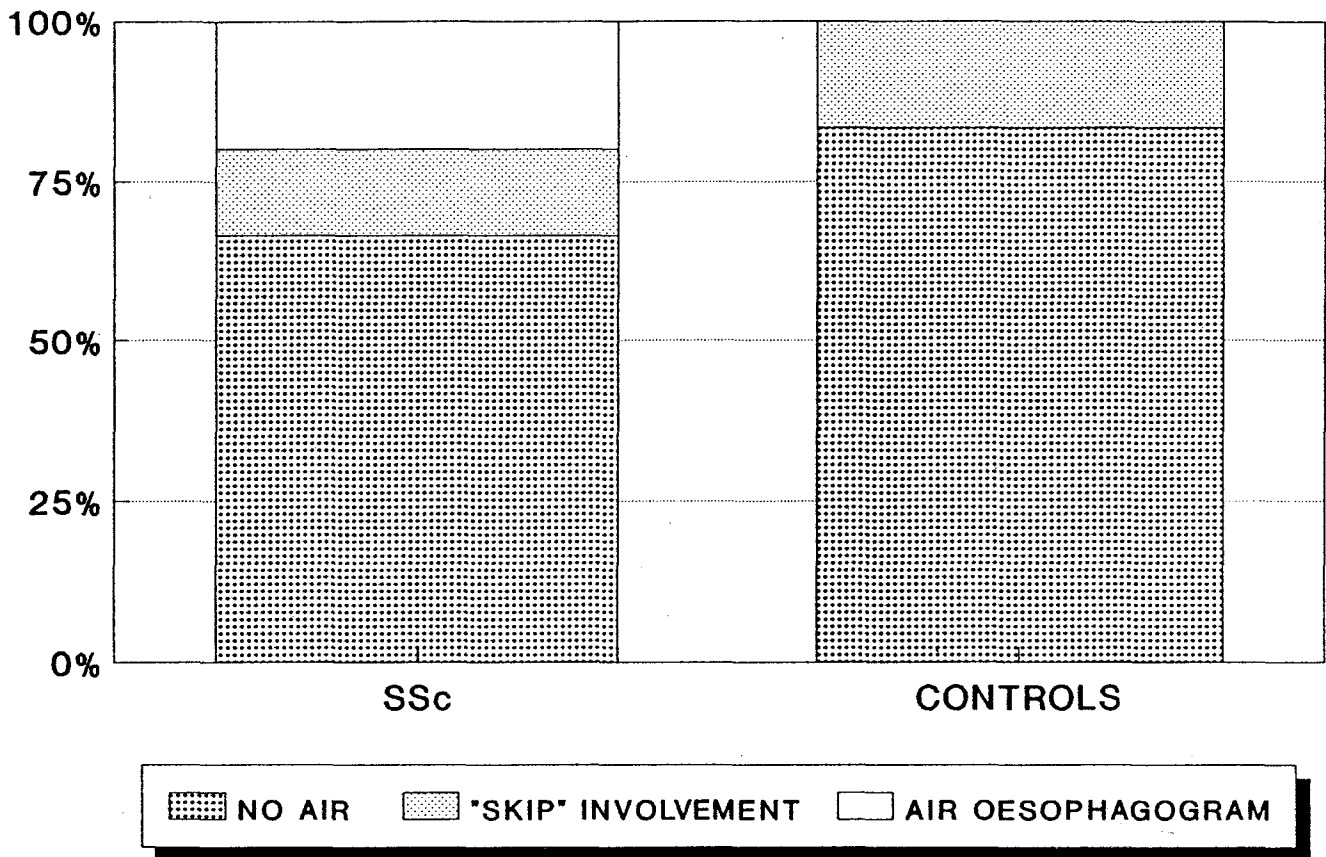


Fig 2: Frequency of an air oesophagogram in patients with SSc and controls.

REFERENCES

1. Cohen, S. The gastrointestinal manifestations of scleroderma: pathogenesis and management. *Gastroenterology* 1980, 79, 155-166.
2. Dinsmore, R.E., Goodman, D., Dreyfuss, J.R. The air esophagram: a sign of scleroderma involving the esophagus. *Radiology* 1966, 87, 348-349.
3. Le Roy, E.C., Black, C., Fleischmajer, R., Jablonska, S.J. et al. Scleroderma (systemic sclerosis): classification, subsets and pathogenesis. *J Rheumatol* 1988, 15, 202-205.
4. Blomquist, G., Mahoney, P.S. Noncollapsing air-filled esophagus in diseased and postoperative chests. *Acta Radiologica* 1960, 55, 32-42.
5. Martinez, L.O., Air in the esophagus as a sign of scleroderma. *J Can assoc radiol* 1974, 25, 234-237.
6. House, A.J.S., Griffiths, G.J. The significance of an air oesophagogram visualized on conventional chest radiographs. *Clin Radiol* 1977, 28, 391-305.

Received: 31 March 1994.

Revision-accepted: 27 July 1994.

Correspondence to: OLIVÉ, M.D.

Rheumatology Section. Hospital Germans Trias i Pujol. Cta del Canyet sn, Badalona, 08916 SPAIN.