

# Tuberculosis and mediastinoscopy

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**Cameron, E. W. J. (1978).** *Thorax*, 33, 117-120. **Tuberculosis and mediastinoscopy.** Biopsy of lymph nodes at mediastinoscopy has been the method of diagnosis of tuberculosis in 14 patients; *Mycobacterium tuberculosis* was cultured from the nodes in nine cases, and in five there was histological evidence of the disease but cultural confirmation was lacking. All patients had radiographic abnormality of the superior mediastinum, and a frequent finding at mediastinoscopy was mediastinal fibrosis involving the fascia and lymph nodes. No cause other than tuberculosis could be demonstrated to account for the mediastinal fibrosis, and the patients made clinical recoveries in response to standard courses of antituberculosis chemotherapy. The development of superior vena caval compression was not observed.

Since the introduction of mediastinoscopy the indications for its use have been the subject of considerable comment, but attention has not been paid to the value of the investigation in the diagnosis of active tuberculosis. During a period when 600 patients were found to have pulmonary tuberculosis, routine methods of diagnosis failed and biopsy of mediastinal lymph nodes provided the only histological and/or cultural evidence of tuberculous infection in 14 patients.

## The patients

Half the patients were male and half were female, their ages ranging from 18 to 66 years with clustering at the extremes of the range. Eight were African, four Indian, and two European. Symptoms in common were cough, loss of weight, and fever, varying from low-grade pyrexia first detected in hospital to classical night sweats. Four patients lacked cough as a leading symptom and presented with a history of more than three months and with non-specific symptoms—tiredness, loss of appetite, and loss of weight. Of those with histories more suggestive of respiratory disease, two also complained of painful dysphagia.

Despite a contemporary family history of tuberculosis in three patients, none had had previous BCG vaccination.

## Investigation of tuberculosis

### RADIOGRAPHY

Pulmonary parenchymal infiltrates were present

on the chest radiographs of 10 patients. Three of the patients presenting with prolonged non-specific symptoms had normal lung fields (Fig. 1), as had one patient with dysphagia. Cavitation was not seen. In each case broadening of the superior mediastinum or deformity of the mediastinal profile was recognised on the postero-anterior chest radiograph, but this abnormality, while evident in the majority, was missed at first sight in three patients. There was no calcification of the mediastinal lymph nodes. No additional information was gained from lateral views or from tomography.

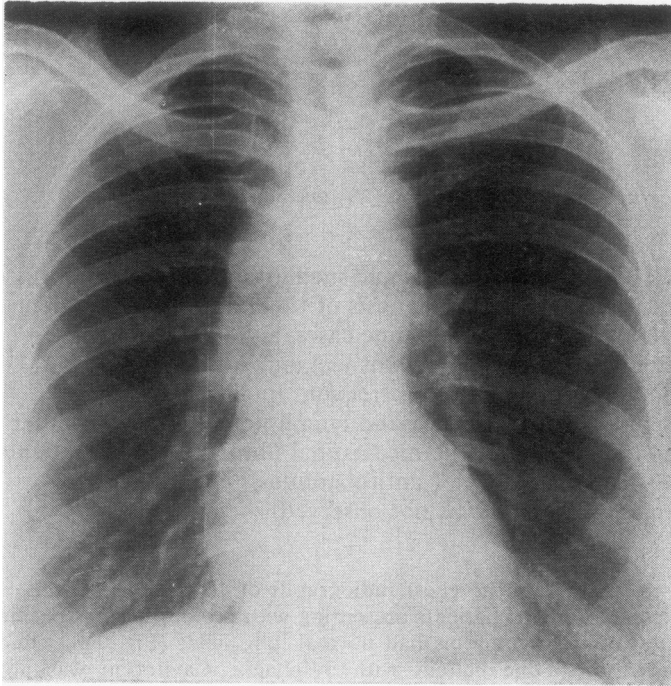
Barium swallow examination was performed in the patients with painful dysphagia and showed oesophageal displacement by an extrinsic mediastinal mass.

### BACTERIOLOGY

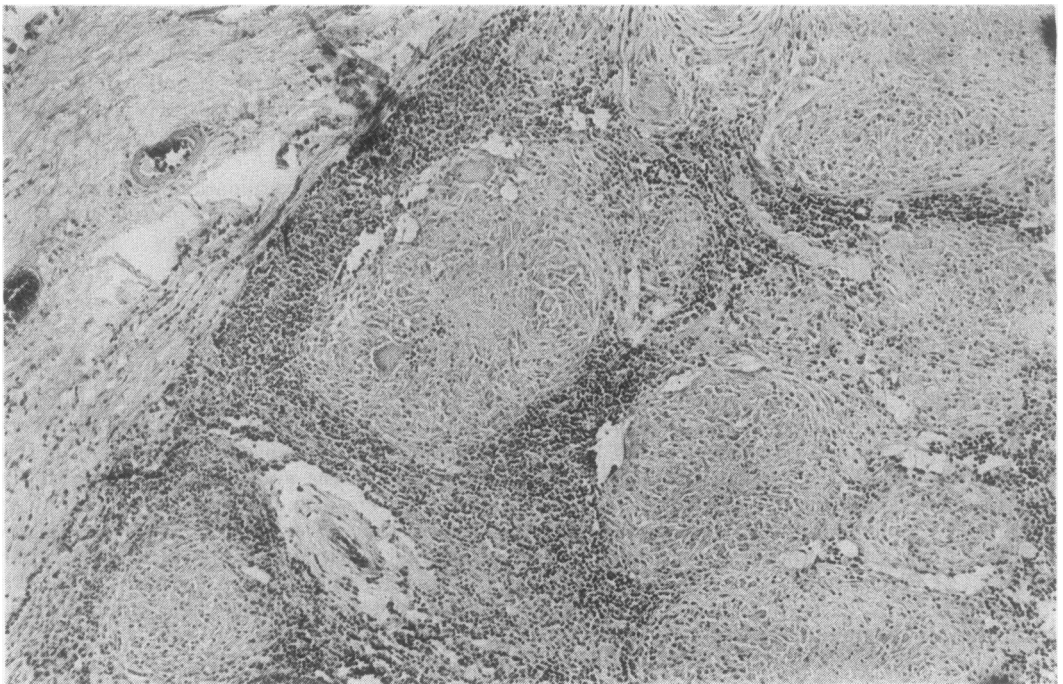
All patients were grade 2 or 3 positive on Heaf testing. Sputum examination by direct smear and concentration techniques, and by culture, was carried out on at least six occasions on each patient. The specimens were taken in hospital, frequently with the aid of a physiotherapist. Trap specimens were also taken at bronchoscopy with a Macrae mucus extractor. *Mycobacteria* were not isolated. Gastric washings were not examined since this technique offers no advantage when multiple sputum specimens are available.

### ENDOSCOPY

Bronchoscopy was performed on all patients and the appearances were normal except in one with



**Fig. 1** *Chest radiograph showing superior mediastinal abnormality in a patient with normal lung fields. Histology of a right tracheobronchial lymph node from this patient is shown in Fig. 2.*



**Fig. 2** *Photomicrograph of mediastinal lymph node showing tuberculous caseation, necrosis, and capsular fibrosis (Haematoxylin and eosin  $\times 64$ ).*



narrowing of the middle lobar orifice; a bronchial mucosal biopsy taken at and within the orifice was uninformative. Patients with tuberculous disease of the oesophagus generally show evidence of this at oesophagoscopy, either as oesophagitis or as an ulcer (Pelemans and Hellemans, 1974). The two dysphagic patients included in this series had normal oesophageal mucosa.

The findings at mediastinoscopy were similar in 12 patients. The pretracheal fascia was thickened and was abnormally adherent to the trachea. Lymph nodes were recognised not by their carbon staining, but as masses of hard, white tissue sited in the tracheobronchial angles and the main carinal angle, and all structures were enmeshed in dense fibrous tissue. Biopsy specimens were taken from the lymph nodes. Niacin-positive mycobacteria were isolated on culture of nine of the specimens, and histologically all showed typical tuberculous lymphadenitis with caseation and fibrosis. Five of the specimens were not submitted for culture.

## Discussion

Adult tuberculosis may be difficult to diagnose. There are published cases where, despite intensive investigation up to and including exploratory laparotomy, the diagnosis has been made only *post mortem* (Ashba and Boyce, 1972). In this series, diagnosis was frustrated before mediastinoscopy by failure to isolate *Mycobacterium tuberculosis* from the sputum. The clinical lead which prompted mediastinoscopy was recognition of an abnormal superior mediastinal shadow on the chest radiograph (Lancet, 1972), a sign which can be elusive.

In several series (Doctor, 1971; Gunstensen and Wade, 1972; Marchand, 1972; Otto *et al.*, 1972), in which a total of 1370 mediastinoscopies is reported, the diagnosis of tuberculosis was made on 26 occasions. No details apart from statistics are mentioned in these papers. Trinkle *et al.* (1970), also reporting the results of mediastinoscopy, investigated 15 patients known to have active pulmonary tuberculosis, but *M. tuberculosis* was isolated from only three of these patients at mediastinoscopy. Sakowitz and Sakowitz (1977) used mediastinoscopy in two tuberculosis patients, who presented with bilateral hilar lymphadenopathy, and made the diagnosis in one. Apart from this latter paper, there are no references to the indication for mediastinoscopy in the patients found to have tuberculosis, and there is no comment on the operative findings.

The salient feature observed at mediastinoscopy

in all but two of the patients in this series was generalised fibrosis of the superior mediastinal fascia. Other causes of mediastinal fibrosis were investigated. There was no history of ingestion of relevant drugs, such as methysergide, and there was no evidence of other fibrosing disease—histoplasmosis, sarcoidosis, or syphilis. None of the patients had or subsequently developed superior vena caval compression, and all patients responded by a loss of symptoms and signs and weight gain to standard courses of antituberculous chemotherapy. The patients have been reviewed over periods of three months to four years and are well. A fibrotic mediastinum containing lymph nodes with thickened fibrous capsules (Fig. 2) might be expected when there is reactivation of disease in mediastinal nodes (Pagel *et al.*, 1964). Hinshaw (1969) estimates that tuberculosis appears in peripheral lymph nodes, joints, bones, and elsewhere in up to 5% of untreated adult patients while the primary disease may be inactive or healed. This explains the radiographic normality of the pulmonary parenchyma in four of the patients, the alternative being the presence of pulmonary lesions too small for radiographic visualisation (Cochrane and Garland, 1952).

From this series several features emerge:

1. The oesophageal mucosa may be normal in patients presenting with painful dysphagia from oesophageal compression by tuberculous lymph nodes.
2. Attention should be paid to the radiographic appearance of the superior mediastinum in patients who are thought to have tuberculosis, and particularly in those who have occult disease.
3. The finding of mediastinal fibrosis at mediastinoscopy should suggest tuberculosis as a possible diagnosis.

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