

# Postpneumonectomy oesophagopleural fistula

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**ABSTRACT** Patients with oesophagopleural fistula after a pneumonectomy present a difficult therapeutic problem. There are two types of presentation, early and late. We report three cases in addition to the 49 previously published. All three patients developed their fistulae after right-sided pneumonectomy (one month, four years, and 21 years respectively) and presented with the features of an empyema. The existence of an oesophagopleural fistula can be demonstrated by the discovery of food particles in the pleural aspirate, by direct visualisation during oesophagoscopy after instilling methylene blue into the pleural cavity, by barium swallow, or by identification of helium in the pleural space after swallowing a mouthful of helium. After the initial treatment of empyema we believe that surgical repair of the oesophagopleural fistula is the treatment of choice.

The development of a fistula between the oesophagus and a pneumonectomy space is one of the rarer postpneumonectomy complications. The table contains a summary of the published world experience. There is a striking preponderance of fistulae after right pneumonectomy, only four cases having occurred after left pneumonectomy.

## Case reports

### CASE 1

In 1953 a right pneumonectomy was performed on a 40-year-old woman for recurrent haemorrhage from a tuberculous lung. At thoracotomy a calcified mass was found near the right hilum which required extensive dissection, and several ligatures were placed near the oesophagus. There was postoperative fever and on the 28th day an oesophagopleural fistula was shown by a barium swallow; this was treated by drainage of the cavity for six months. The patient's general condition improved although the fistula persisted. In 1965 the patient was admitted to this hospital for the first time. She gave a history of intermittent fever and had recently noted an unpleasant taste and smell. A chest radiograph showed an air bubble in the right hemithorax and a barium swallow showed that the oesophagus was displaced

to the right with a fistula at the level of the tracheal bifurcation (fig 1). The fistula could not be visualised by bronchoscopy or oesophagoscopy but at thoracotomy an oesophageal diverticulum which communicated with the upper part of the pneumonectomy cavity was resected. The postoperative course was uneventful.

### CASE 2

In 1954 a right upper lobectomy was performed on a 40-year-old man for recurrent tuberculosis. There was postoperative haemorrhage and after a second thoracotomy an empyema and bronchopleural fistula developed. In 1955 the remainder of the lung was removed but the empyema and bronchial fistula persisted. The patient first attended this hospital in 1958 when an empyema was still present. Culture of the pus grew staphylococci and yeasts. Conservative therapy with daily irrigation and antibiotics was unsuccessful. Neither bronchography, bronchoscopy, nor helium rebreathing revealed a bronchopleural fistula. At thoracotomy the presence of an oesophagopleural fistula, showed before operation by barium swallow, was confirmed and repaired. The postoperative course was uneventful.

### CASE 3

In 1952 a right pneumonectomy was performed on a 32-year-old man. There was a postoperative empyema which was treated by drainage only

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Table Summary of published cases of postoperative oesophagopleural fistula

Authors	Year of publication	Number of cases		Male	Female	Indication†		Onset	
		Right	Left pneumonectomy			Neoplasm	Others	Early	Late
Muller <i>et al</i>	1952	1		1			1 chronic suppurative		
Pecora, Brook <sup>2</sup>	1958	1		1			1 TBC		1
Stander, Robinson <sup>3</sup>	1959	1			1		1 TBC		1
Takaro <i>et al</i> <sup>4</sup>	1960	21	3	†	†		19 TBC 2 abscess	10	14
						1 adenoma			
							1 suppurative 1?		
Dumont, de Graef <sup>5</sup>	1961	3	1	3	1		4 TBC		4
Eriksen <sup>6</sup>	1964	4		3	1	3	1 TBC	4	
Santos <i>et al</i> <sup>7</sup>	1964	1		1			1 TBC	1	
Benjamin <i>et al</i> <sup>8</sup>	1969	3		1	2	3		2	1
Engelman <i>et al</i> <sup>9</sup>	1970	1			1	1		1	
Evans <sup>10</sup>	1972	8		8		8		3	5
Efthimiades <i>et al</i> <sup>11</sup>	1974	1		1		1			1
Present paper	1979	3		2	1		3 TBC	1	2
		48	4			17	35	23	29
Total			52				52		52

†sex incidence not stated.

‡ TBC=Tuberculosis.

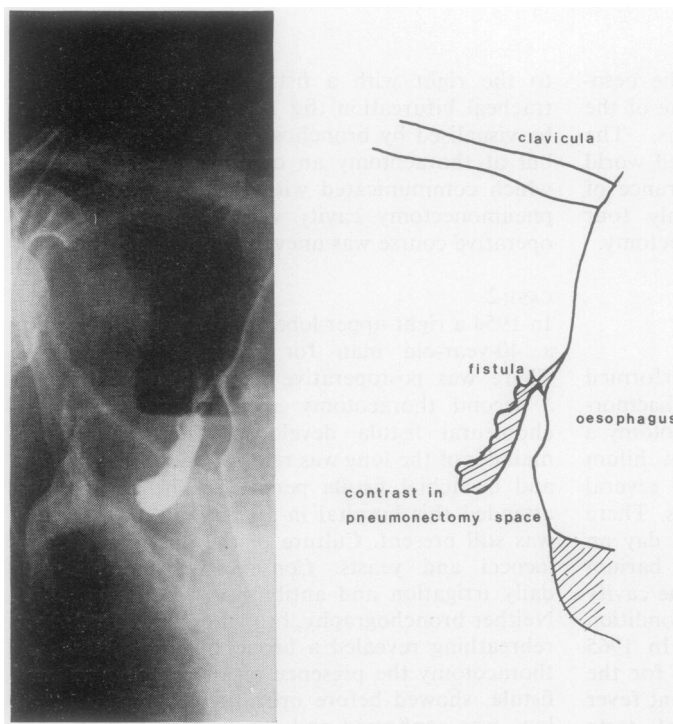


Fig 1 Oesophagography with a fistula at the level of the tracheal bifurcation.

to reappear some months later. The patient was admitted to this hospital, when the pleural aspirate yielded pus containing staphylococcus aureus. The empyema was treated with irrigation and antibiotics with relief of symptoms until 1973 when

there was a recurrence of fever and the empyema reappeared. Aerobacter aeruginosa was cultured from the pleural fluid. An oesophagopleural fistula was shown radiologically (fig 2), and at oesophagoscopy a large traction diverticulum was seen 35

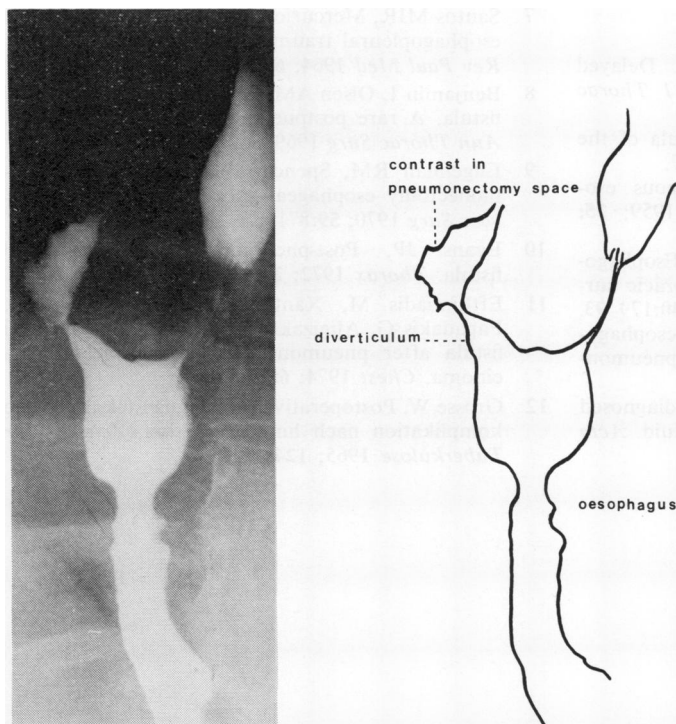


Fig 2 Oesophagopleural fistula in the bottom of a large diverticulum.

cm from the incisor teeth, whose opening was identified after injecting methylene blue into the pleural cavity. At thoracotomy the fistula was located 3 cm below the carina, and the diverticulum was excised. The oesophageal defect was closed with a double layer of sutures. There was an uneventful postoperative recovery.

## Discussion

A review of the published cases (table) shows that a distinction should be made between early and late fistulae.<sup>4-8</sup> Early fistulae are the result of a difficult dissection because of adhesions or removal of lymph nodes leading to direct injury of the oesophageal wall.<sup>1-4 10 11</sup> A pre-existent diverticulum can be excluded by preoperative oesophagography.<sup>2 4 8</sup> Direct surgical perforation can lead to the early appearance of a fistula or to an occult perforation. The latter can lead either to a secondary perforation or to a periesophageal abscess. Surgical lesions of the muscular wall of the oesophagus may also underlie the delayed perforation.<sup>5</sup> The closer anatomical relationship of the oesophagus and right hemithorax explains the preponderance of right sided cases. On the left side the aorta is interposed between the oesophagus and pleura.<sup>4 8 7-10</sup> The fistulae are usually at or

near the carina, an area where most surgical manipulation occurs, and at this level the blood supply to the middle third of the oesophagus is poor.<sup>1 5 8 9</sup> Fistulae occur most commonly after pneumonectomy for tuberculosis or inflammatory disease, because in these conditions the dissection is often difficult. Patients may present with non-specific symptoms such as lassitude, chest pain, or fever and occasionally having noticed food particles in the chest drain. In late cases, weight loss, non-productive cough, or a foul taste in the mouth have been described. Other aids to diagnosis include barium swallows, oesophagoscopy in association with intrapleural methylene blue and finally a helium test. In this latter test a needle is introduced intrapleurally and the patient is asked to swallow a mouthful of helium. The helium is displaced into the oesophagus and will leak into the pleura if a fistula is present. The pleural gas is then analysed for the presence of helium.

Once the diagnosis is established we no longer favour conservative therapy such as drainage of the empyema, local irrigation, antibiotics, tube feeding, gastrostomy, or jejunostomy.<sup>2 4 12</sup> We prefer intracaval high calorie nutrition, local treatment of the empyema, and as soon as the patient's condition permits the direct reconstruction of the oesophageal wall.

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**The Fourth European Congress on Diseases of the Chest** is to be held in Thessaloniki, Greece from 1-4 June 1981. The meeting is sponsored by the International Academy of Chest Physicians and Surgeons. For further details please apply to Professor CP Stavropoulos, PO Box 1016, Thessaloniki, Greece.