Thorax, 1979, **34**, 554–556

Surgical treatment of adenoid cystic carcinoma of the left main bronchus and trachea by left pneumonectomy, resection of 7·5 cm of trachea, and direct reanastomosis of right lung

G STALPAERT, G DENEFFE, AND R VAN MAELE

From the Department of Thoracic and Cardiovascular Surgery, Academisch Ziekenhuis, St Rafael, Leuven, Belgium

ABSTRACT A 23-year-old woman, who had suffered recurrent acute bronchitis, dyspnoea, and stridor, was found to have a tracheal stenosis and complete left main bronchus obstruction. Biopsy of the tumour showed an adenoid cystic carcinoma. After pneumonectomy the trachea was closed through tumour tissue. Two weeks later a right thoracotomy showed that a tumour had invaded the trachea from the carina up to 6 cm and the right stem bronchus for 1 cm. Under extracorporeal circulation 7·5 cm of the trachea and right bronchus were resected. A direct tracheal anastomosis was easy to perform. Spontaneous respiration with efficient coughing returned after five days. Unfortunately, one month later, high fever caused by a lung abscess developed, which provoked a massive haemoptysis with fatal outcome.

Tumours of the trachea are rare. Squamous cell carcinoma accounts for 55% and adenoid cystic carcinoma for 30% (Wilkins *et al*, 1963; Houston *et al*, 1969). Earlier surgical treatment was difficult but from the work of Barclay *et al* (1957), Mathey *et al* (1961), Abbey-Smith and Karunakaran (1965), and Grillo (1964, 1965, 1973) totally different attitudes developed for dealing with these tumours, discarding grafting procedures for direct anastomosis.

The case we presented was special, and to our knowledge such a case has never been treated by radical direct surgery without grafting.

Case report

The patient was a 23-year-old woman who had suffered from recurrent bronchitis, dyspnoea, and stridor for three years. On clinical examination there was a pronounced decrease in breath sounds on the left side of the chest and wheezing was heard over both lungs. Laboratory findings were negative. Chest radiographs showed deviation of the heart to the left on inspiration with a return to normal on expiration. The diagnosis of complete left bronchial obstruction was obvious. Tracheal tomography showed a mass totally compressing the left main bronchus and obstructing the inferior part of the trachea (fig 1).

Bronchoscopy showed a submucous tumour obstructing two-thirds of the trachea 4 cm above the carina. The left main bronchus was almost completely blocked while the right was normal. No biopsy specimen was taken.

An exploratory thoracotomy showed a white, functionless left lung. The left main bronchus was replaced by a mass of tumour extending into the carina and the trachea. No tumour was found in frozen sections of lymph nodes. Left pneumonectomy was performed through tumour tissue, frozen sections of which showed adenoid cystic carcinoma. Tracheal extension of the tumour was higher than indicated by bronchoscopy (4 cm). We preferred to close the tracheal gap through tumour tissue, and to cover it with pericardium. Although Abbott *et al* (1955) and Houël *et al* (1958) performed tracheal resections from the left side after mobilisation of the aorta, we preferred a right tracheal approach at a second stage because of the extension of the tumour.

One week after operation she developed acute ischaemia of the left leg, necessitating an embolectomy which was successful. Microscopic study of the embolus did not show a metastasis.

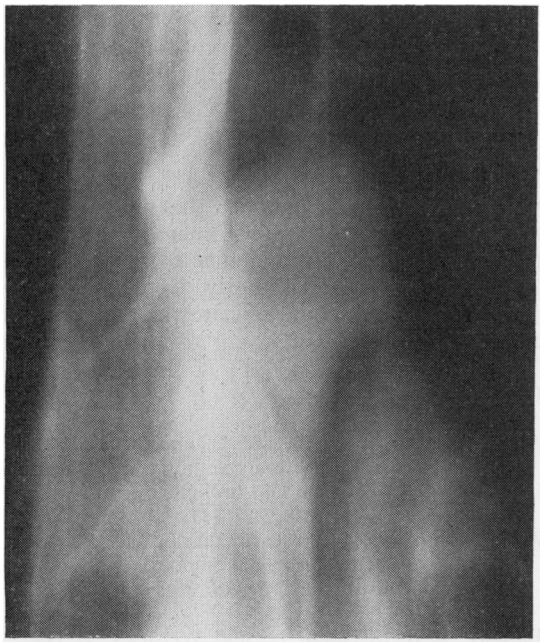

Fig 1 *Tomography of trachea showing a mass totally compressing left main bronchus and obstructing inferior part of trachea.*

Sixteen days later a radical operation was undertaken using the right fifth intercostal space. Division of the inferior pulmonary ligament, mobilisation of the right hilus with loosening of the carinal attachments, and intrapericardial pulmonary vessel dissection made it possible to have complete mobility of the trachea. Expecting some difficulties with ventilation during resection and anastomosis because of the invasion of the right bronchus, we decided to use extracorporeal circulation. On opening the trachea it was found that about 6 cm of the left side of the trachea was affected together with 1 cm of the right main bronchus. After resection (7·5 cm), adequacy of excision was confirmed by frozen section study of the proximal and distal cut edges (fig 2). A direct anastomosis with interrupted mersilene sutures was performed without any tension (fig 3). Devolvement of the cervical trachea (Grillo, 1973) was not necessary. The anastomosis was covered with free pericardium. Spontaneous respiration with efficient coughing returned after five days. One month after the first procedure high fever developed which continued despite antibiotics. An infiltrate was seen at the right lung base. Four days later a massive haemoptysis with cardiac arrest occurred. Resuscitation was not successful.

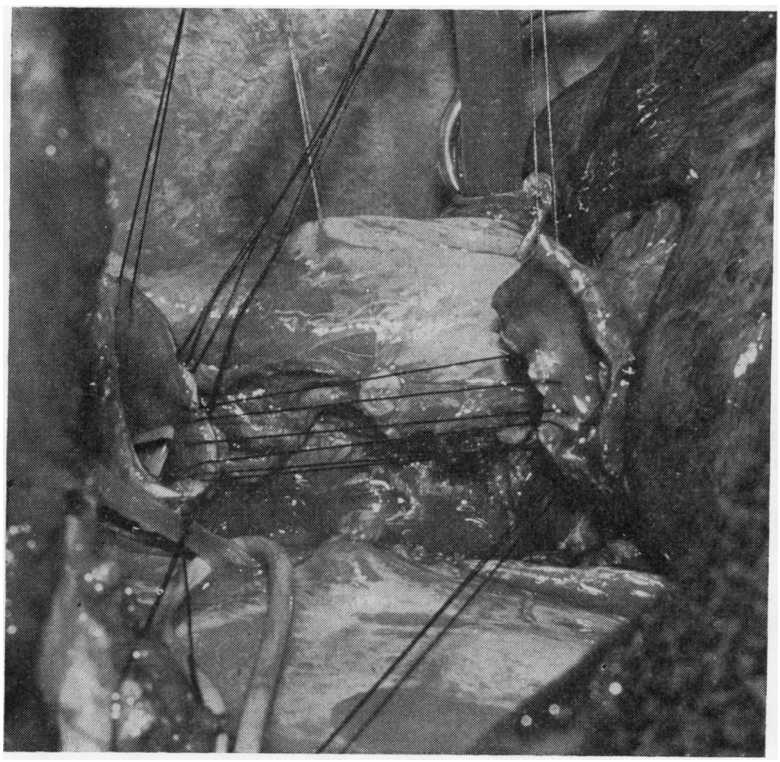

Fig 2 *Gap of 7·5 cm between trachea and right main bronchus after excision of tumour.*

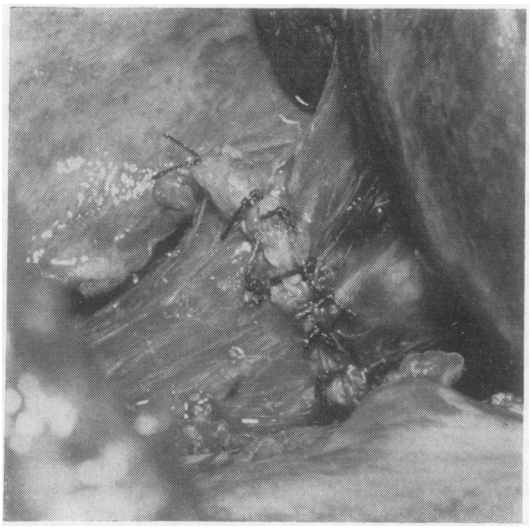

Fig 3 *End-to-end anastomosis without any tension. Devolvement of cervical trachea was not necessary.*

Pathological findings

Microscopically, the tumour, consisting of interlacing strands of tumour cells surrounded by connective tissue, was characteristic of adenoid cystic carcinoma. Mitoses were scanty. The PAS stain was positive.

At necropsy the lumen of the trachea was filled with blood clot. The circular suture line was intact. The lower part of the right lung had a dark red aspect. In the apex of the lower lobe there were two perforations of an abscess into the pleural cavity.

Distant metastases were not found. The major salivary glands showed no tumour.

Discussion

Previous publications have shown that long tracheal resections are possible. The studies of Grillo (1965, 1973) confirm that up to 6·6 cm can be resected. This had already been shown in dogs by Ehrlich *et al* (Barclay *et al*, 1957), who first performed a left pneumonectomy and in a second stage resected 4–6 cm of trachea successfully.

The use of extracorporeal circulation was helpful since there was no embarrassment in performing the tracheal anastomosis. Covering the suture line with a pericardial or pleural flap certainly protects against leakage and the development of mediastinitis.

Conclusion

We should like to emphasise that, although unsuccessful, our case shows that long tracheal resections are feasible and that there is no need to use foreign material. Early diagnosis remains a problem but it should obviate the necessity for extensive resections.

References

Abbott, O A, van Fleet, W E, and Roberto, A E (1955). Experience with extending the indications for the use of tracheal and bronchial grafts. *Journal of Thoracic Surgery*, **29**, 217–237.

Abbey-Smith, R, and Karunakaran, K P (1965). Exposure of benign tracheal tumours by transverse division of the trachea. *British Journal of Surgery*, **52**, 270–276.

Barclay, R S, McSwan, N, and Welsh, T M (1957). Tracheal reconstruction without the use of grafts. *Thorax*, **12**, 177–180.

Grillo, H C (1965). Circumferential resection and reconstruction of the mediastinal and cervical trachea. *Annals of Surgery*, **162**, 374–388.

Grillo, H C (1973). Reconstruction of the trachea. *Thorax*, **28**, 667–679.

Grillo, H C, Dignan, E F, Miura, T, and Scannell, J G (1964). Extensive resection and reconstruction of mediastinal trachea without prosthesis or graft: an anatomical study in man. *Journal of Thoracic and Cardiovascular Surgery*, **48**, 741–749.

Houël, J, Lebon, P, and Cullige, P (1958). Le traitement des tumeurs primitives de la trachée endothoracique. *Presse Médicale*, **66**, 729–732.

Houston, H E, Payne, W S, Harrison, E G, and Olsen, A M (1969). Primary cancers of the trachea. *Archives of Surgery*, **99**, 132–140.

Mathey, J, Binet, J P, Denis, B, Oustrieves, G, and Fredet, J (1961). Chirurgie des tumeurs primitives de la trachée. *Les Bronches*, **9**, 256–280.

Wilkins, E W, Darling, C, Soutter, L, and Sniffen, R C (1963). A continuing clinical survey of adenomas of the trachea and bronchus in a general hospital. *Journal of Thoracic and Cardiovascular Surgery*, **46**, 279–291.

Requests for reprints to: Professor D G Stalpaert, Academisch Ziekenhuis, St Rafael, Kapucinjnenvoen 33, 3000 Leuven.