# MANAGEMENT OF MASSIVE HAEMOPTYSIS BY PERCUTANEOUS TRANS-ARTERIAL EMBOLISATION: A CASE REPORT

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## SUMMARY

**A young man with severe impairment of respiratory function due to previous tuberculosis presented with recurrent massive haemoptysis causing hypotension, anaemia and respiratory failure. The successful management of the haemoptysis using percutaneous transarterial embolisation (PTE) of the right bronchial artery is documented here.**

## INTRODUCTION

Massive haemoptysis (arbitrarily defined as more than 600 millilitres of blood per 48 hours) occurs in about 1–4% of haemoptysis,[1,2] and can be associated with a mortality exceeding 75%.[3] Debilitated or obtunded patients and those with poor respiratory reserve may develop respiratory failure with much smaller haemorrhage; the morbidity and mortality may then be due to asphyxiation rather than exsanguination.

The management of such patients includes: protection of the airway and blood transfusion; and identification of the source and site of the haemorrhage followed by appropriate therapy. If the haemoptysis is uncontrolled, operative intervention and resection is indicated. In selected circumstances other measures may be employed; these are PTE[4] and tamponade of the abnormal area using a balloon-tipped catheter introduced through a bronchoscope.[5]

A case in which massive haemoptysis was controlled by PTE is reported here.

## CASE REPORT

A.M., a 36-year-old Malay male came to the University Hospital Kuala Lumpur in June 1983 for recurrent haemoptysis. He had been treated in 1975 for bilateral pulmonary tuberculosis, and hospitalised again in 1980 for a left pneumothorax requiring chest tube drainage. Haemoptysis had occurred daily for over a week. On admission he was pale and hypotensive (90/60 mmHg) with tachycardia. There was a thoracic deformity with right-sided flattening and shift of the mediastinum to the right.

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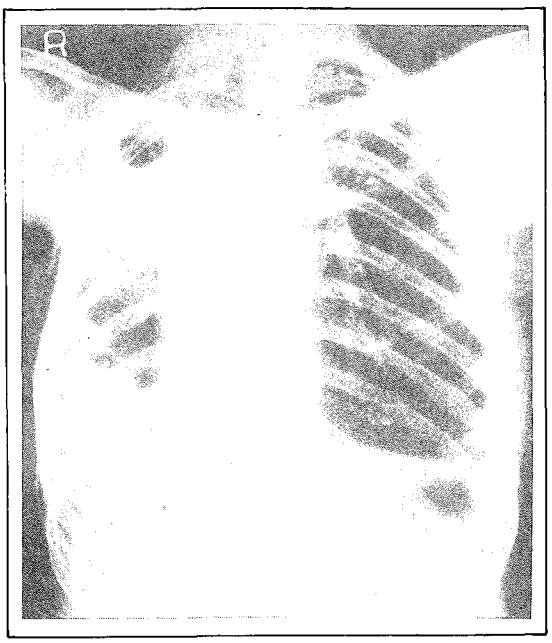

**Fig. 1 The chest radiograph shows extensive right sided fibro-cavitary disease, left upper lobe disease, and bilateral basal pleural thickening with classification on the right.**

Auscultation showed crepitations on the right and bronchial breath sounds in the left apex.

His haemoglobin on admission was 8.2 g% and white count 7,400/mm$^3$. The chest X-ray revealed bilateral abnormalities (Fig. 1) and his sputum was repeatedly negative for acid-fast bacilli.

He had further bouts of haemoptysis with volumes of blood loss up to 500 ml at a time, and his haemoglobin fell to 7.7 g% at one stage, necessitating blood transfusions. Bronchoscopy showed bleeding from the right upper lobe, but no other endobronchial pathology. His respiratory function parameters showed a marked restrictive defect with respiratory failure (forced vital capacity 860 ml, $pO_2$ 39 mmHg, and $pCO_2$ 54 mmHg). He was thought to be unsuitable for surgery, treated conservatively and discharged.

He was readmitted again with severe haemoptysis in December, and it was therefore decided that transcatheter embolisation was the only feasible management for his recurrent, potentially fatal haemoptysis. The procedure was carried out by retrograde femoral catheterisation under local anaesthesic. A 5-French gauge 'Cobra' catheter was advanced into the high descending aorta and an enlarged single right bronchial artery was located. After an injection of 1 ml of Iopamidol 200, the patient was observed closely and the frames reviewed on video-tape: no spinal or intercostal arteries filled. A definitive arteriogram followed, using 5 mls of the same contrast medium. This showed the systemic arterial supply to the fibrotic right upper lobe with regions of hypovascularity corresponding with cavities (Fig. 2).

No contrast stain appeared to suggest active bleeding but as bronchoscopy had shown bleeding from the right main bronchus and the bronchial artery was itself enlarged, as occurs in recurrent haemoptysis, embolisation was carried out using fragments of gelfoam in absolute alcohol and contrast medium. Pethidine 50 mg intravenously was administered during this painful procedure and the immediate results appeared satisfactory (Fig. 3).

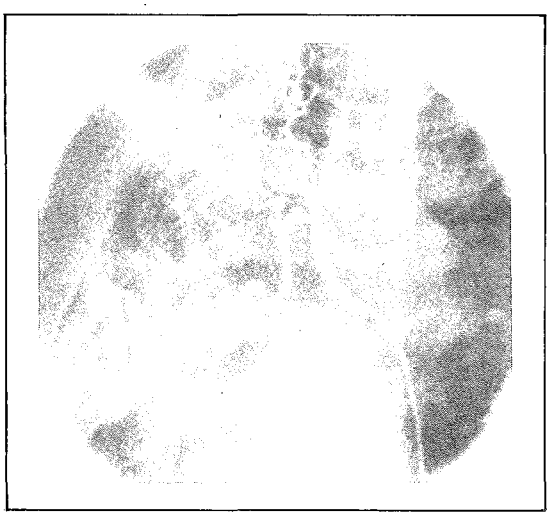

**Fig. 2 Right bronchial arteriogram: a single enlarged bronchial artery supplies the right lung with no contribution to the spinal artery. Hypovascular areas indicate cavities.**

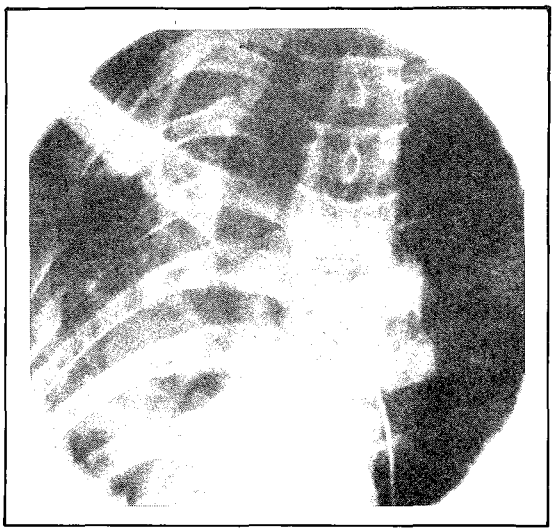

**Fig. 3 Repeated right bronchial arteriogram: the artery is completely occluded a few centimeters from its origin.**

Following the procedure, the haemoptysis cleared and the patient made satisfactory progress and was subsequently discharged. At subsequent follow-up, he reported recurrence of the haemoptysis two months later, but in much smaller quantities.

## DISCUSSION

Transarterial control of bleeding was first reported by Rosch *et al.*, in 1972:[6] this was in the gastro-intestinal tract, and embolisation has since been performed at many sites to control haemorrhage due to inflammatory disease, neoplasm and trauma. Embolisation materials have included absorbable sponge, wire coils, detachable balloons and cyano-acrylate polymers ('superglue'). Absolute alcohol is a powerful sclerosant and may be used in association with solid matter.

Since 1974 Remy has reported more than 100 cases of PTE for the management of haemoptysis.[4,7] Similar experience, although with fewer numbers, has been gained at other centres.[8–11] Control of bleeding is reported in 84–100% of procedures, with 0–20% recurrence rate within one to eight months. Chest pain and fever are common sequelae. The complications of sepsis and inappropriate embolisation can be avoided by meticulous attention to asepsis and to the actual technique of embolisation. The anatomical relationship of the bronchial, intercostal and spinal radicular arteries are such that they may have a common origin: should a spinal artery fill on the initial bronchial arteriogram embolisation is contra-indicated.

Recurrent haemoptysis is not uncommon following PTE. In cases of chronic lung disease this is likely to be due to the development of collaterals. There is however no contra-indication to repeated bronchial angiography and embolisation if the systemic blood supply to the area is found to be re-established.

Percutaneous transarterial embolisation is the treatment of choice in the management of internal haemorrhage in patients who are poor operative risks: it may allow pre-operative resuscitation of a patient in hypovolaemic shock, and for a patient with permanent cardiorespiratory disability, PTE alone may be sufficient, as in this patient.

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