BRONCHIAL FRACTURE FOLLOWING BLUNT CHEST TRAUMA*

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Fractures of the trachea or major bronchi are becoming increasingly common, in particu'ar fractures of one or other bronchus. Between 1848 and 1948 only 61 cases were reported and another 94 cases were reported in the following 10 years.[1] Hood and Sloan[2] in 1959, in a comprehensive review of the world literature, found only 18 reports of traumatic tracheal rupture. Nevertheless, fractures of bronchi following blunt chest trauma are still rare enough to warrant single case reports.

CASE REPORTS

Case 1

A 9-year-old Coloured boy was admitted to hospital after having sustained severe injuries in a motor vehicle accident. On admission he was shocked and only partly conscious. The following injuries were diagnosed:

(*a*) A closed head injury—no skull fractures.
(*b*) A right-sided tension pneumothorax with rib fractures, from the second to the eighth rib. He also had gross surgical emphysema.
(*c*) Closed fracture mid-shaft right femur.
(*d*) Closed fracture mid-shaft right tibia and fibula.
(*e*) Compound fracture mid-shaft right humerus.
(*f*) Closed fractures of the right radius and ulna at the distal quarter.

He was resuscitated actively by blood transfusions and by the introduction of an underwater drainage tube into the right chest. The fractures were splinted. He showed immediate response and his level of consciousness improved over the days to normality.

The air leak from the lung continued, and after a week the diagnosis of lacerated lung was revised. He was then transferred to Red Cross War Memorial Children's Hospital and taken to theatre. Bronchoscopy proved beyond doubt the presence of a ruptured middle lobe bronchus. A right thoracotomy was performed and the right middle lobe bronchus, which was almost completely torn off the right intermediate bronchus, sutured back into place, using interrupted 3-0 black silk sutures.

Ten days later the thoracotomy sutures were removed and the patient was fit enough to be transferred back to the orthopaedic wards at Groote Schuur Hospital.

He was seen again 6 months after discharge from the hospital, completely fit and with no chest signs or symptoms.

Case 2

A 16-year-old Bantu girl was also the victim of a motor vehicle accident. She was admitted with dyspnoea and was only slightly grazed on the left cheek. Chest X-ray revealed a pneumothorax on the left (Fig. 1).

An underwater drainage tube was inserted. Fractured bronchus was suspected due to the air leak and the lack of subsequent expansion of the lung (Fig. 2). Consent for operation could only be obtained 3 days later. Bronchoscopy confirmed the diagnosis. At thoracotomy there was an oblique fracture of the left main bronchus, the two

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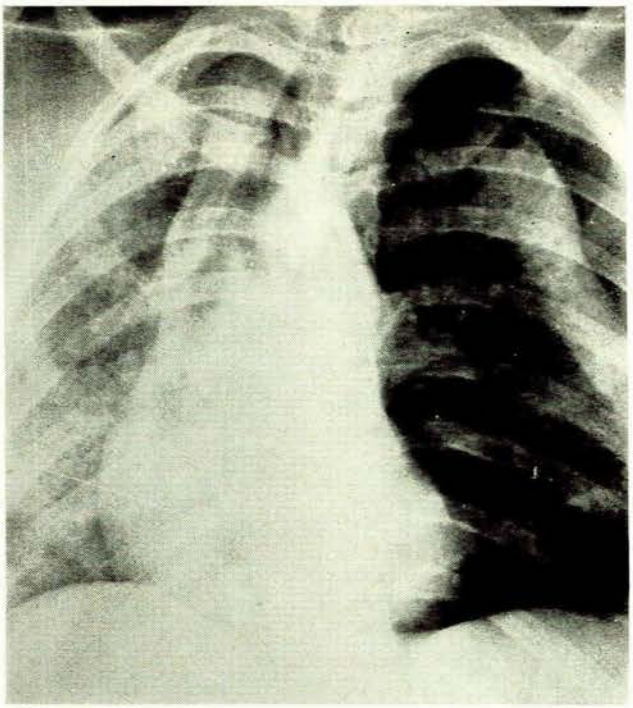

Fig. 1. Chest X-ray on admission showing left-sided pneumothorax and an intact thoracic cage.

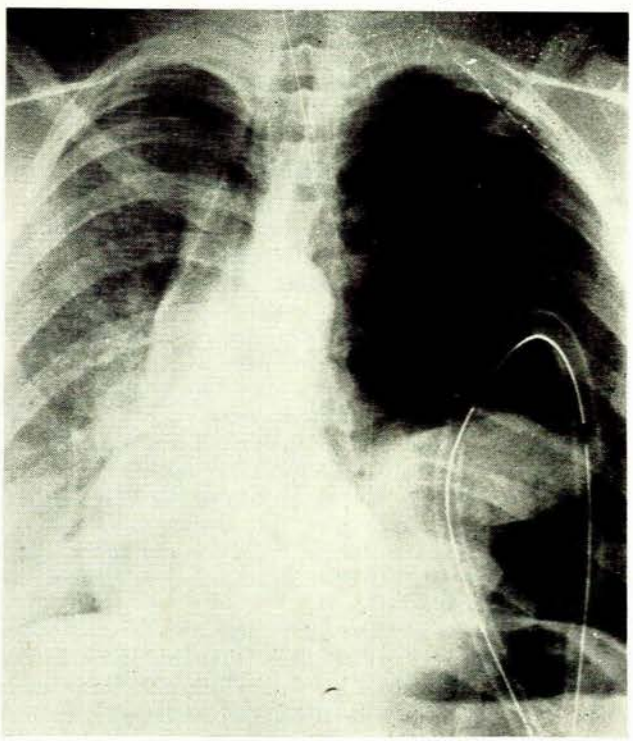

Fig. 2. Complete collapse of the left lung with no expansion even after a high-volume suction machine was used. The intercostal underwater drainage tube can be seen.

fascia[3] also suggests the diagnosis of rupture of a bronchus.

Complications

If the patient survives and treatment is not prompt, three main complications may be expected.

Atelectasis. The effects of atelectasis after successful bronchial anastomosis have been studied by Mahaffey *et al.*[8] Findings such as may be encountered in a right-to-left shunt are reported. They also noted a lower vital capacity, decreased oxygen uptake and a decreased pulmonary compliance.

Bronchial stenosis. There is no uniformity of thought as to the frequency with which stenosis will result from an untreated fractured bronchus.[1,2,5,7,9-11]

Pulmonary sepsis. This is the most severe complication. Although Drapanas *et al.*[10] report a case of complete reversal of bronchiectasis after re-anastomosing the two bronchial ends, it is felt that this is the exception rather than the rule. Coxatto and Lanari,[12] in their study of the pathogenesis of bronchiectasis, feel that where there is complete obstruction to the distal bronchus, bronchial secretion will cease before irreparable damage has been done because of a pressure build-up due to bronchial secretions.

Mahaffey *et al.*[8] reported a case of complete recovery after anastomosis was done, where only a sterile gelatinous plug was aspirated from the distal segment. If, however, secondary infection develops, permanent damage is almost inevitable. This unhappy finding occurs in about 25% of cases, mostly those where the obstruction is incomplete.[13]

Treatment

Although cases of successful repair of ruptured bronchi have been reported as long as 11 years after the fracture had occurred,[8] the treatment of choice is immediate re-anastomosis of the fracture, or suturing of the laceration with interrupted black silk or wire sutures.

SUMMARY

Two cases of fractured bronchi which have been successfully treated have been reported. Traumatic fractures of the bronchi following blunt chest trauma have been discussed in general and the importance of early repair to prevent stenosis and/or permanent lung damage has been stressed again.

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