Case Report

Pneumonectomy for advanced bronchiectasis in a child


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Abstract

Summary

Bronchiectasis in children in developing countries is still a health problem and is a major surgical challenge in advanced cases. It can be associated with tuberculosis in up to 30% of cases. We present a case of bronchiectasis in a 7 years old girl who presented with 3 years history of repeated attacks of chest infection. Both clinical and radiological examination showed a completely destroyed left lung and the decision was for doing pneumonectomy. The patient developed cardiac arrest following intubation due to blockage of the endotracheal tube by spillage of thick mucous secretions from the diseased lung. She was resuscitated and the surgery was postponed for 3 weeks and then left lung pneumonectomy was performed. The patient had a stormy postoperative course with mechanical ventilation for 12 days followed by a tracheostomy. The tracheostomy was removed after 3 weeks and she was discharged 4 weeks later. Two years later, the child is healthy and going to school regularly with 30 kg body weight.

Keywords: bronchiectasis, pneumonectomy, tuberculosis

Introduction

Bronchiectasis is a localized irreversible dilatation of bronchi more than 2mm in diameter that result from destruction of muscular and elastic components of bronchial wall(9). Although bronchiectasis occurs most often in adults, its incidence in children is under reported in developing countries(9). Beside pneumonia and tuberculosis, other causes of bronchiectasis are concomitant or subsequent infection with agents such as hisoplasmosis, viruses and certain fungi, foreign body aspiration, cystic fibrosis,
congenital absence of supportive airway cartilage (Kartagener’s syndrome), immunodeficiencies (IgA), asthma and middle lobe syndrome\(^3\). Pneumonectomy is the treatment of choice for end stage lung diseases like bronchiectasis, with low mortality and morbidity\(^4\). Tracheostomy in children is a life saving and relatively safe procedure without absolute contra indication\(^5\).

The incidence and indication for paediatric tracheostomy have changed from upper airway obstructions to prolonged ventilation to avoid complications of prolonged endotracheal intubations\(^6\). We report a case of bronchiectasis with lung destruction that underwent pneumonectomy which was followed by respiratory failure that needed a temporary tracheostomy for 3 weeks.

**Case report**

R.E, a seven years old girl, weighing 14.5 kg, from eastern Sudan, presented with 3 years history of productive cough, which was thick greenish and white in colour, associated with low grade fever. She was diagnosed at that time as pulmonary tuberculosis in Port Sudan and was given anti-tuberculous treatment for 4 months without improvement. She continued to have repeated attacks of chest infection, with occasional hospital admission. Later, the interval between attacks became shorter, and the patient’s general health was deteriorating and hence she was referred for surgical treatment. She was seen by a paediatric chest physician in Khartoum over the few weeks prior to surgery where she had intensive treatment in form of chest physiotherapy, antibiotics and dependent drainage. Clinical examination revealed an ill child with signs of left lung suppuration, coarse crepitations and deficient air entry. No finger clubbing was observed. Both plain chest radiograph and CT scan showed massive bronchiectasis involving the left lung with multiple small abscesses (Fig 1,2).

The patient was therefore considered for left total pneumonectomy. Following endotracheal intubation directed to the right lung to exclude the left diseased lung and positioning by tilting to the right side, the oxygen saturation dropped and she went into cardiac arrest.
Case Report
Pneumonectomy Mohamed ElMakki Ahmed

She recovered following resuscitation, bronchial suction and IV 3rd generation cephalosporins. She had intensive chest physiotherapy for the following 3 weeks followed by left total pneumonectomy. On the third postoperative day, she started to develop fever, cough and became distressed with wheezes all over chest and drop in oxygen saturation. She was referred to a paediatric ICU in Ahmed Gasim Hospital where endotracheal intubation was done and a tracheostomy tube fixed 5 days later. Twelve days later, she was off the ventilator and was successfully weaned from the tracheostomy after 3 weeks and was discharged after 4 weeks. Two years later, she was asymptomatic (Fig 3). The histopathology of the resected specimen was negative for tuberculosis.

Fig 3: The patient 2 years postoperative

Discussion
The prevalence of bronchiectasis has declined in developed countries with improved health care and the availability of suitable antibiotics. It continues to be an important problem in developing countries because of increased prevalence of tuberculosis, pneumonia and other childhood infections. The majority of cases present in a late stage of the disease, where the definite aetiology is difficult to establish, due to prolonged history of recurrent infection and inadequate medical treatment. In a series of 166 patients who underwent pneumonectomy, the indication in 158 was bronchiectasis with failure of medical treatment(7).

In spite of this serious condition which can be prevented by early diagnosis and adequate treatment of chest infection during childhood, relatively scanty information has been written in the literature(8).

Post pneumonectomy pulmonary oedema is a serious uncommon early post-operative complication. Its aetiology has not yet been well-defined, many factors were incriminated like; fluid over load, the amount of tissue resected and sepsis as in our case(9).

The decision and preparation for surgery should be in co-operation with radiologist and the anatomy should be mapped clearly and the diseased part well localized. Both paediatric chest physician and the, anaesthetist must be involved early. Certain precaution is needed to avoid serious complication during the course of surgery like the use of bronchus blocker such as a fogarty catheter or using double lumen intubations to avoid spillage of secretions to the healthy lung(10). In our patient, spillage of secretions into the right lung lead to hypoxia and cardiac arrest. Careful isolation of the healthy lobe or the healthy other lung is crucial.

The morbidity and mortality rates of bronchiectasis surgery are within acceptable ranges. Most of the children benefit from surgery, especially when total excision is accomplished. Pneumonectomy is well tolerated in children without increase in morbidity and mortality. Therefore, pneumonectomy may be preferred instead of leaving residual disease when bronchiectasis is unilateral(10). The need for prolonged ventilation necessitated the performance of tracheostomy, a life-saving procedure, but carries high morbidity and a mortality of 15% in some series(11). The indications for

38
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paediatric tracheostomy are shifting in the developed world with congenital malformations now topping the list\(^{(12)}\).

In conclusion, surgical treatment of bronchiectasis poses a great challenge and has to be multidisciplinary. Pre-operative work-up with intensive physiotherapy and total isolation of the healthy lung during intubation are essential for a safe surgical resection. Long-term follow-up is satisfactory and in our case the child is healthy, active and regular at school.

References: