CASE REPORT

Pneumonia Presenting as Acute Abdomen in Children: A Report of Three Cases

S Vendargon, MS*, P S Wong, FRCS (CTh)*, K K Tan, MRCP, *Department of Cardiothoracic Surgery, **Department of Paediatrics, Sultanah Aminah Hospital, 80100 Johor Bahru, Johore**

Summary

From 10th September 1998 till 5th June 1999, the Paediatric and Cardiothoracic Surgery Units of Sultanah Aminah Hospital Johor Bahru managed three children with lung collapse secondary to pneumonia. The dominant initial clinical presentation in all three cases was acute abdominal pain. Basal pneumonia was diagnosed in two cases post-operatively after surgical contributory causes were excluded intra-operatively. Thoracotomy, evacuation of infected debris and decortication of the collapsed lung was done in all three cases. In children presenting with acute abdominal pain, basal pneumonia should be considered as a possible contributory cause.

Key Words : Acute abdomen, Abdominal pain, Appendicitis, Pneumonia

Introduction

Children with acute abdominal pain, especially if associated with fever, are frequently admitted to hospital for observation. This is usually to rule out acute appendicitis, which is the most common cause[1]. There are a number of other causes of abdominal pain in children listed in Table I.

Investigations are done to come to a working diagnosis within a few hours of admission. Abdominal pain may be the only presenting symptom of an underlying pneumonia in children, as illustrated in the following three cases.

Case Reports

Case 1

A 5-year-old boy was admitted on 10th September, 1998 with a five-day history of cough and fever, associated with central abdominal pain and distension. On examination, the child was febrile and looked toxic. The lower abdomen was tender and guarded. There was a leukocytosis. A diagnosis of perforated appendicitis was made. Appendicectomy performed the same day revealed a normal appendix. Histopathological examination of the appendix subsequently did not show any inflammatory changes. Postoperatively the child continued to have a spiking fever and a rising leucocyte count despite intravenous antibiotics.

Examination of the lungs at this stage revealed decreased air entry with bronchial breathing in the right lower zone. A chest radiograph showed a total "white out" of the right lung and the child was referred to the paediatrician for further management. A chest drain was inserted which drained 750 mls of turbid fluid. Culture of this fluid did not grow any organism; but Streptococcus pneumonia antigen was positive. As there was no change in the status of the right lung in the subsequent chest radiographs, a computed tomograph

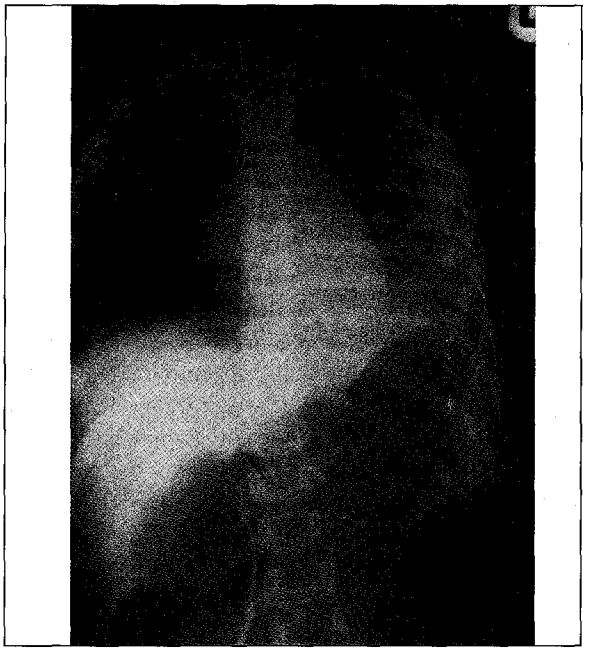

Figure 1: Chest radiograph showing dilated loops of bowel

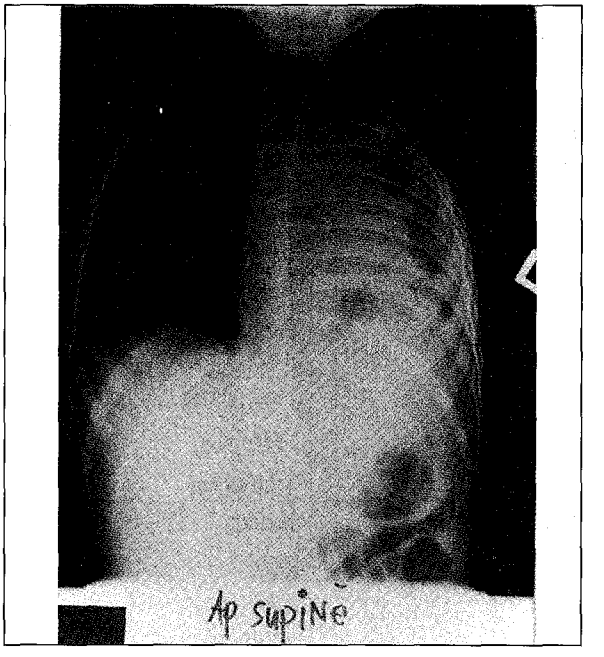

Figure 2: Chest radiograph showing collapse consolidation of the left lung

(CT) scan of the thorax was requested which revealed a multiloculated empyema of the right lung. The child was then referred to our unit for further management.

As the child had a large loculated pyopneumothorax, we performed a right thoracotomy, evacuated all the infected debris and decorticated the right lung. This was done 19 days after the initial presentation. The postoperative recovery was rather protracted and the chest drains remained insitu for three weeks. The child was then sent home well with the right lung partially consolidated. On review 6 weeks postoperatively, the chest radiograph showed a completely expanded right lung.

Case 2

A 4-year-old boy was admitted on the 6th of June 1999 with a history of cough, lower abdominal pain and fever for 3 days. On examination the child was toxic and febrile and the lower abdomen was tender and guarded. A diagnosis of acute appendicitis was made. Appendicectomy done the same day revealed a normal appendix. Histopathological examination of the appendix subsequently showed faecal matter in the lumen with no neutrophilic inflammation seen. Postoperatively the child continued to remain toxic and febrile with a rising leucocytosis.

Examination of the chest revealed decreased air entry in the right lung field. Chest radiograph showed a total opacification of the whole right lung. A chest drain was inserted which drained 50 mls of pus. Gram negative bacilli was isolated from the pus but no organisms were subsequently grown. A CT scan of the thorax showed collapse of the right upper, middle and lower lobes with fluid collection. The child was then referred to our unit for further management.

A right thoracotomy, evacuation of infected debris and decortication of the right lung was done 14 days after initial presentation. Subsequent chest radiographs showed gradual expansion of the right lung and the

Table I
Important causes of acute abdominal pain in children [1]

Gastrointestinal	Appendicitis
	Constipation
	Mesenteric adenitis
	Gastroenteritis
	Hepatitis
	Henoch-Schonlein purpura
	Inflammatory bowel disease
	Inflamed Meckel's diverticulum
	Pancreatitis
Genito-urinary	Infection
	Calculus
	Reflex
	Hydronephrosis
	Torsion of testis
Diabetic ketoacidosis	
Gynaecological	
Pneumonia	
Porphyria	
Trauma	

child was discharged well 10 days later. On review of the child at 6 weeks the lung was fully expanded.

Case 3

A 2-year-old girl presented on 19th May 1999 with a one-week history of cough, high-grade fever and increasing breathlessness. On examination the child was febrile, toxic and tachypnoiec. The abdomen was soft. Examination of the lungs revealed bilateral basal crepitations more heard in the left base. The chest radiograph on admission was essentially normal. The child was treated for left bronchopneumonia but two days later continued to remain ill. The abdomen at this stage was distended and tense. A subsequent chest radiograph showed collapse consolidation of the whole left lung with air fluid levels in the abdomen (Figure 1). A diagnosis of perforated viscus was made and emergency laporotomy was performed. There was no pus in the peritoneum and the appendix was normal. Appendicectomy was done. Histopathological examination of the appendix showed neutrophilic infiltrates limited in the vessels with no inflammation in the stroma.

Postoperatively the child needed ventilation for 6 days. Subsequent chest radiographs in the intensive care unit revealed a non-resolving collapse consolidation of the left lung (Figure 2). The child was still unwell, spiking a fever with leucocytosis. A chest drain was inserted which drained 200 mls of pus. Culture of the pus grew Methicillin sensitive Staphylococcus aureus. The child was then referred to our unit for further management, 14 days after initial presentation. A diagnosis of left bronchopneumonia progressing to an empyema with collapsed left lung was made.

A left thoracotomy, evacuation of infected debris and decortication of the left lung was done. The child improved tremendously after this and was discharged ten days later. On follow-up at 6 weeks, the left lung had completely expanded.

Discussion

All three patients presented to us at a late stage in the natural history of the pneumonia, requiring surgical intervention after failed medical therapy. Our first two cases were diagnosed to have acute appendicitis on admission, which delayed the diagnosis of pneumonia. Although the third case was diagnosed to have a left bronchopneumonia on admission, she developed signs of an acute abdomen two days after admission. This was indistinguishable from a surgical cause necessitating a laporotomy.

Children who present with acute abdominal pain sometimes pose a difficult diagnostic problem. As seen in our three patients, abdominal pain may be the only presenting symptom of a pneumonia in children. The abdominal pain could be referred pain secondary to diaphragmatic irritation from a basal pneumonia. This

theory however has been refuted as pneumonia affecting the upper and middle lobes can still present with right sided abdominal pain. The mechanism of abdominal pain in pneumonia is still unclear[2].

Children, especially younger children find it more difficult to localise abdominal pain, and this is well illustrated in our 3 cases who are all aged 5 years or less. Therefore it is important to examine the child as a whole and not just confine one's attention to the abdomen. Diagnostic difficulties of acute abdomen are more pronounced in younger children. Lower lobe pneumonia accounts for between 2% and 5% of causes of acute abdominal pain in children[1]. The severity of the abdominal symptoms over the thoracic findings contributes towards this diagnostic error as well seen in our first two patients. All children with symptoms of an acute abdomen should have a thorough examination of their chest. It is not usual paediatric practice to take radiographs of the chest as a routine in all cases of abdominal pain. This is to prevent extra irradiation to the child and also to prevent extra costs. However when there is clinical uncertainty, the diagnostic value of the abdominal radiograph can be increased by including the lung bases[1].

Our third patient on initial examination was diagnosed to have a left lower lobe pneumonia, although the first chest radiograph was normal. When she developed an acute abdomen the abdominal radiograph showed a collapse consolidation of the left lung together with air fluid levels in the abdomen. A laporotomy was performed as a surgical cause had to be ruled out. Acute appendicitis can still present together with pneumonia[3]. Of 737 cases of acute appendicitis reported by Brichman et al, seven cases were reported in which the preoperative diagnosis of pneumonia had resulted in a delay of operation. When surgery was eventually done, all seven of these patients had either gangrene or perforation of the inflamed appendix[3].

Children who present with a history of cough. fever and abdominal pain have to be carefully evaluated. Complete examination of the child is important to rule out extra-abdominal causes of the pain like pneumonia. This exercise is sometimes difficult as pneumonia can present together with acute appendicitis.

With increased awareness of this association and of extra abdominal causes of acute abdomen, the diagnostic delays of pneumonias and negative laporotomy rates can be reduced.

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