Unusual presentation of more common disease/injury

Acute scoliosis in a 3-year-old boy

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The case describes the presentation of a fit and well 3-year-old boy to the emergency department of a district general hospital after he developed an acute scoliosis overnight. There was no history of trauma, his observations were normal and he had non-specific symptoms of lethargy and reduced appetite, but no fevers or respiratory distress. Bloods showed raised inflammatory markers and he was referred to orthopaedics as a septic disc as there was some spinal tenderness. An urgent MRI was considered initially but on further examination there was some reduced air entry on the left lung base which a chest radiograph confirmed as a left-sided pneumonia. A diagnosis of pneumonia and secondary functional scoliosis was made. The child was admitted under paediatrics and made a full recovery on antibiotics. At 8 weeks follow-up there was resolution of scoliosis clinically and radiologically.

BACKGROUND

This case highlights the difficulties in assessing children and the importance of careful multi-system examination. It raises awareness of acute scoliosis secondary to pneumonia, which is seldom encountered in accident and emergency (A&E) or orthopaedics. It is also unique due to the lack of clinical signs normally expected of pneumonia in a young child, such as fever, cough and respiratory distress. The scoliosis is often an incidental finding in this group, rather than a presenting symptom. Thus clinicians should be thorough with their history and examination to pick up subtle signs that may aid diagnoses of unusual presentations of common conditions.

CASE PRESENTATION

A 3 old boy, with no significant medical history, was brought to the emergency department by his parents as he had developed an abnormal posture overnight. He also had some non-specific symptoms of lethargy and decreased appetite in the last week. The child had an obvious scoliosis with mild back-ache but there was no history of trauma, no neurological signs and he was otherwise well. The parents were reassured and the child discharged with a follow-up clinic appointment in 3 days.

At the emergency department clinic, a consultant reviewed the child and revisited the history. The child was off his food, lethargic, had an occasional dry cough, but no fevers, dyspnoea or pleuritic chest pain. Ear, nose, throat and abdominal examination were unremarkable. At this point there was thoracic spine tenderness and an orthopaedic opinion was requested to address concerns of a septic disc, as there were raised inflammatory markers on bloods tests.

A consultant orthopaedic surgeon reviewed the child. The scoliosis was still prominent and did not disappear when the child was picked up or sat down. There was obvious asymmetry of the rib cage on Adam's Forward Bend Test. The child had para-spinal tenderness on the left, but no midline thoracic pain. An urgent MRI was considered

but some decrease in air entry in the left lower lung field was noted, and therefore a chest x-ray was obtained. Apart from the obvious scoliosis, there was shadowing over the left lower lung field which the radiologist confirmed was consistent with pneumonia.

INVESTIGATIONS

Blood tests revealed a white cell count of 14.2, with a neutrophilia of 9.7, raised platelet count of 682 and a C reactive protein of 86.

Chest x-ray (figure 1) showed shadowing over the left lower lung field which the radiologist confirmed was consistent with pneumonia.

DIFFERENTIAL DIAGNOSIS

Left-sided pneumonia with secondary scoliosis from para-spinal muscle spasm.

TREATMENT

The child was admitted to paediatrics and received intravenous benzylpenicillin for 24 h before being discharged on course of oral amoxicillin.

OUTCOME AND FOLLOW-UP

On follow-up at about 8 weeks postdischarge, the child was clinically well and radiographs of the chest (figure 2) confirmed resolution of the pneumonia as well as scoliosis. The formal report commented on clear lung fields with little residual pleural thickening on the left lateral chest wall and a minor cervico-thoracic spinal curvature being still appreciable.

DISCUSSION

Scoliosis in children has a variety of well documented causes in the literature and can often be a diagnostic conundrum. Acute scoliosis is more alarming and may often be referred urgently for further diagnostic tests, especially if associated with back pain. Disc herniation has been shown

Figure 1 Posteranterior chest x-ray on admission showing the left-sided pneumonia with a prominent thoracic scoliosis towards the affected lung.

to present with acute scoliosis¹ as has infection such as spinal osteomyelitis.² Eric Loveless³ has discussed paediatric structural scoliosis (mostly idiopathic) and functional scoliosis secondary to poor posture, limb length discrepancies and paraspinal muscle spasm. Paraspinal muscle spasms can be secondary to injury, appendicitis, pyelonephritis and pneumonia.³ A study of appendicitis in 215 children showed that scoliosis, caused by psoas muscle spasm, was apparent in 57% of non-perforated cases, and 65% of perforated cases.⁴ Pleural effusions associated with pneumonia are known to present with unilateral chest signs and commonly produce a scoliosis.⁵

The BTS guidelines have recognised that scoliosis is a common but transient complication of pleural disease in children, secondary to pleuritic pain. Follow-up is recommended to ensure resolution of scoliosis.⁶

A literature review by Mukerjee *et al*⁷ has mentioned five case series which have shown that scoliosis can be associated with empyema in a broad paediatric age group.^{8–12} Follow-up was evaluated in one of these studies which showed that all their 12 cases completely resolved by 6 months.¹¹ Mukerjee *et al*⁷ also conducted their own research of paediatric scoliosis secondary to pleural infection by reviewing cases at a tertiary paediatric centre in London between 2002 and 2005. One hundred and twenty two cases of patients with either a parapneumonic effusion or an empyema were retrospectively analysed. Presenting signs and symptoms included shortness of breath, fever, cough and increased respiratory rate. Their results showed that 71% of children had a scoliosis at presentation or developed a scoliosis during the admission. The scoliosis showed no association with age, gender, inflammatory markers and size or type of effusion. The scoliosis always involved the thoracic spine with the scoliosis being towards the affected lung (ie, convexity of spine pointing to the unaffected side). All cases that attended follow-up showed acceptable resolution of scoliosis, the majority within 2 months. Thus a 6 to 8 week follow-up should be ideal to examine both pneumonic and scoliotic resolution. Any residual scoliosis should alert the clinician to consider other causes including idiopathic scoliosis.

Figure 2 Posteranterior chest x-ray on 8 weeks follow-up showing resolution of both pneumonia and scoliosis.

As per research by Mukerjee *et al*⁷ our case report also demonstrates a thoracic scoliosis towards the affected lung. Therefore, an opposite pattern of thoracic scoliosis or a lumbar scoliosis should also raise flags to the clinician to consider an orthopaedic review and rule out other pathology.

Unlike the literature, our case demonstrates an unusual presenting complaint where the child was brought in by his parents due to concerns of the acute scoliosis, and even clinicians did not initially pick up on subtle respiratory features of slightly reduced air entry in the left base.

The literature also discusses that the scoliosis is associated with pleural disease, such as empyema and parapneumonic effusions. However, in our 3-year-old boy, there were no obvious radiological signs of a pleural effusion. The follow-up x-ray report, however, comments on residual pleural thickening, thereby implying there was some degree of pleural involvement during presentation.

Learning points

- Pleural disease (empyema/parapneumonic effusion) is a common cause of functional scoliosis in children. The amount of effusion need not be large on radiographs to cause scoliosis.
- In the majority of cases such children will have an obvious history or examination of respiratory problems, but as highlighted by this case, the signs may be subtle.
- We hope to raise awareness of secondary scoliosis among non-paediatric clinicians who may encounter such cases, such as A&E and orthopaedic doctors.
- In general, children are tricky patients to diagnose; hence a meticulous history and multi-system examination should be conducted so not to miss an unfamiliar disease.

Competing interests None.

Patient consent Obtained.

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