Beware the bifid rib!

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A 4-year-old girl was referred to Tygerberg Academic Hospital with a long-standing history of an asymptomatic anterior chest wall 'lump'. On physical examination, a bony mass was palpated in relation to the anterior aspect of the left 4th rib. Plain radiography demonstrated anterior widening of the left 4th rib (Fig. 1). Fearing a sinister cause, a multidetector computed tomography (MDCT) examination of the chest, with 3D reconstruction and volume rendering, was performed (Fig. 2). A congenital bifid left 4th rib was demonstrated.

Discussion

A bifid rib, or sternum bifidum, is a congenital abnormality of the anterior chest wall, with the sternal end of the rib cleft into two. It occurs in approximately 1.2% of the population and is usually unilateral. Bifid ribs are frequently asymptomatic. A single bifid rib is most commonly a normal incidental finding discovered on chest radiography.[1] It may be associated with Gorlin-Goltz basal cell nevus syndrome, a rare autosomal dominant condition characterised by multiple nevoid basal cell carcinomas, jaw cysts and bifid ribs. Further features include other rib anomalies, deficiency of the lateral clavicle, mandibular hypoplasia, macrocephaly and mental retardation.[1]

A large number of disease processes frequently affect the chest wall in children, including congenital anomalies, inflammatory and infectious processes and neoplasms, both benign and malignant.

Congenital anomalies of the anterior chest wall are common. Studies by Donnelly *et al.*[2] and Wong *et al.*[3] demonstrated a prevalence of 33% and 36% respectively for anatomical variations of the chest wall. In another study, Donnelly *et al.* demonstrated that all patients who presented with asymptomatic lesions of the chest wall had benign conditions, most commonly a congenital anomaly.[2]

Apart from congenital anomalies, other benign primary bony lesions include fibrous dysplasia, aneurysmal bone cyst and osteochondromata.[4] Infectious causes such as osteomyelitis, tuberculosis and fungal infection could also be considered, although these lesions are often more aggressive and rarely asymptomatic.[2] The literature highlights the fact that malignant lesions of the chest wall are commonly aggressive and are often associated with symptoms such as pain, dyspnoea and local tenderness. Plain radiography often reveals bony and pleural involvement in addition to chest deformities.[2]

It can be concluded for small, non-tender lesions isolated to the anterior chest wall that demonstrate no history of interval growth, that clinical examination and chest radiography may suffice, with ultrasound as backup.[5]

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4. Donnelly L, Frush D. Abnormalities of the chest wall in pediatric patients. AJR 1999;173:1595-1601.
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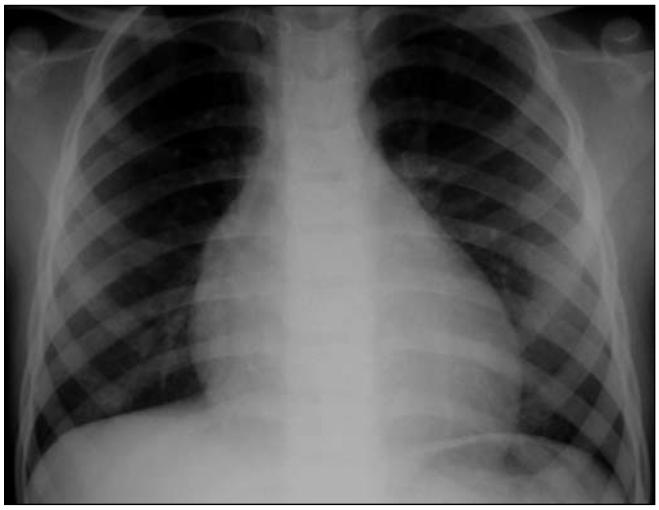

Fig 1. Plain radiograph of the chest demonstrating a bifid 4th rib on the left.

Fig 2. A 3D MDCT reconstruction, with volume rendering, confirming the presence of a left 4th bifid rib.