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Online Case Report

Compression fracture or butterfly vertebra: diagnostic importance in a trauma setting

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Butterfly vertebra is a rare congenital malformation of the spine with only a few cases have been reported as incidental finding. We describe a 13-year-old girl admitted to the trauma unit with head injury. Radiological investigations revealed an incidental L1 butterfly vertebra that was initially interpreted as a burst fracture. Clinically, there was no neurological deficit. Although this uncommon congenital anomaly is usually asymptomatic, awareness of this deformity is very important in making correct diagnosis in a trauma setting.

Case report

A 13-year old girl fell off a horse and was admitted to accident and emergency with head injury. She was agitated on admission. Her GCS was 12/15. She was intubated and ventilated because of worsening of agitation. X-ray of lumbar spine revealed a longitudinal defect in the body of lumbar vertebra with displaced pedicles suggestive of apparent burst fracture of L1 (**Fig. 1a,b**). CT head was normal and spiral imaging of lumbar vertebrae (T12–L2) showed a large wedge-shaped defect involving the entire width of the vertebral body with no evidence of canal compression or facet dislocation. Pedicles and laminae appeared intact. No para-vertebral soft tissue swelling was seen. The appearance of the vertebral body defect was symmetrical with corticated margins. (**Fig. 2a,b**). A diagnosis of butterfly L1 vertebra was made with no evidence of acute injury. Later, the patient was extubated and kept under observation. She was comfortable without any back pain or spinal tenderness. A complete neurological examination during secondary survey was normal. Review of her past history suggested occasional low back pain during horse riding for which she had never consulted a doctor. She had normal physiological growth and development and there was no relevant family history. She was discharged from the hospital after 48 h of observation.

Discussion

Butterfly vertebra was first described in 1844,[1] also termed sagittal cleft vertebra, anterior rachischisis, somatoschisis and anterior spina bifida.[2–4] This is usually asymptomatic and sometimes associated with other congenital anomalies (Mullerian hypoplasia/aplasia,[5] Jarcho-Levin syndrome,[6] Pfeiffer's syndrome,[7] and Alagille syndrome[8]).

This defect is considered to occur between the third and sixth week of gestation. In developing vertebral bodies, two lateral chondrification centres normally fuse to form one vertebral body. Complete failure of fusion of one centre results in formation of hemivertebra. Failure of fusion of two centres results in the formation of butterfly vertebra.[9] In the lateral radiograph, the butterfly vertebra shows either trapezoidal or cuneiform anterior wedging, which may be confused with compression fracture because, wedging is the most obvious radiological sign of a hyperflexion compression fracture. Since the fracture needs immediate treatment, it is important to make a differential diagnosis between the two conditions.[3] The butterfly vertebra is easily detected in antero-posterior radiograph, because the vertebra is split into lateral

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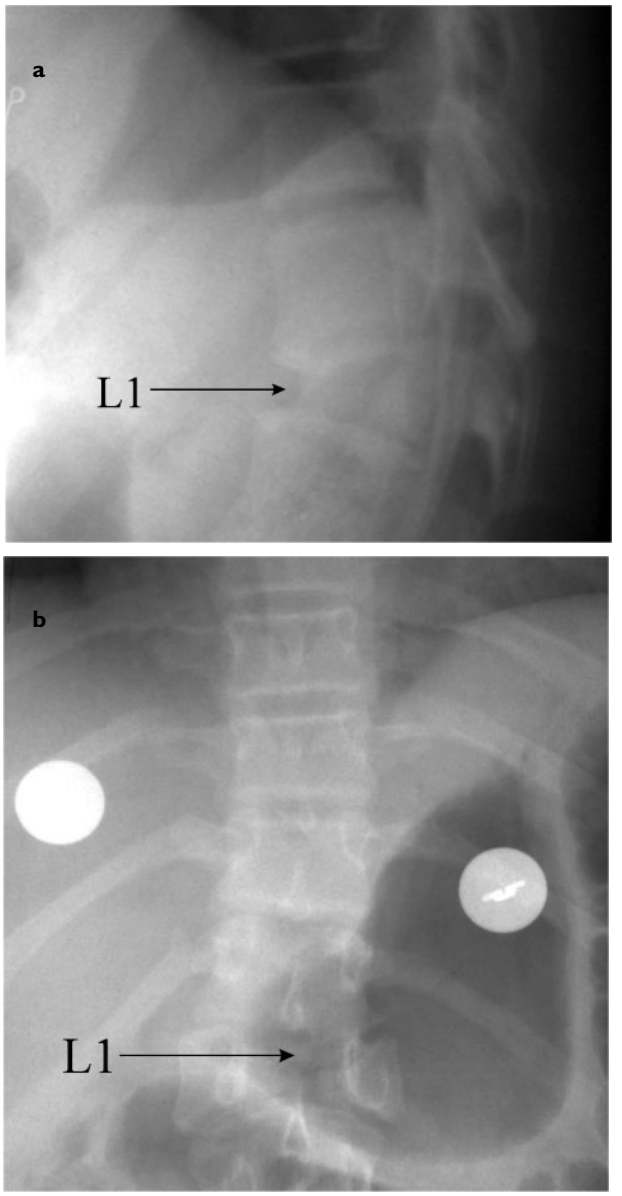

Figure 1 (a) Lateral and (b) antero-posterior radiographs of the lumbar spine showing the appearance of the butterfly vertebra at L1.

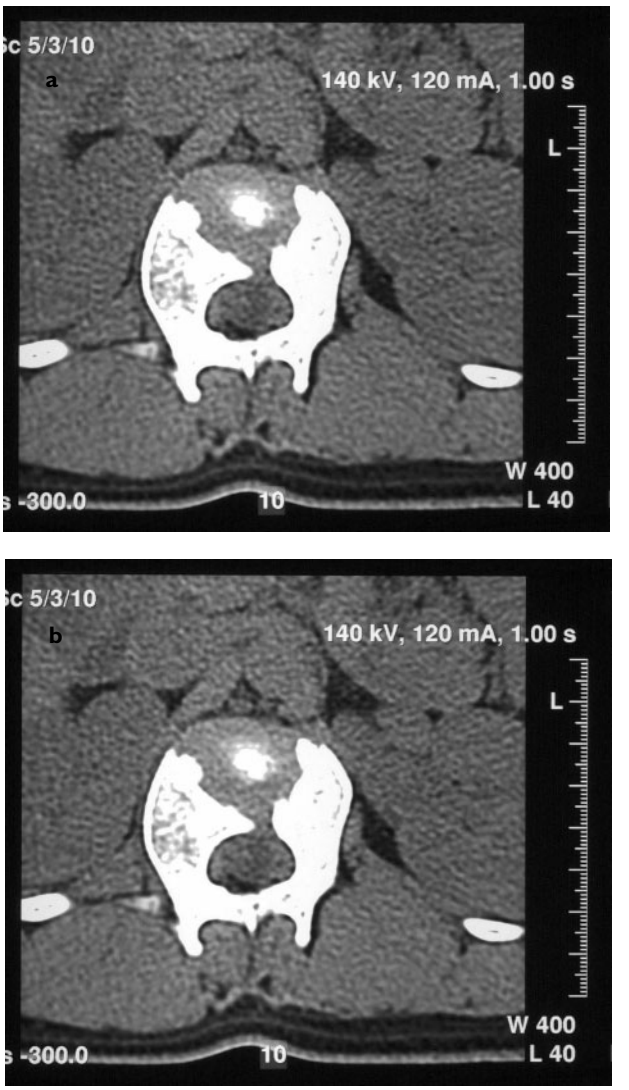

Figure 2 (a) CT scan image of L1 vertebra showing symmetrical vertebral body defect with corticated margins. (b) CT scan image of L1 butterfly vertebra with intact pedicles and facets.

halves of hemivertebra, usually of same size, which look like the wings of a butterfly.[10] The pedicles may look divergent in antero-posterior view as the vertebral bodies are segmented. Anterior and spiral CT scan is indicated in doubtful cases.[3] Axial CT may demonstrate the sagittal cleft defect with sclerotic margins. In addition, the intervertebral disc of the butterfly vertebra may have density irregularity continuous with discs above and below the anomalous vertebral body.[4] Although this vertebral anomaly is considered as incidental and usually asymptomatic, its imaging features may suggest other differential diagnosis like compression, burst or wedge fracture. Therefore, awareness of this entity and imaging features are essential to make a correct diagnosis, especially in a trauma setting.

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