

Sternal Segment Dislocation in a Child Treated by Conservative Observation

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Sternal segment dislocation is rare in children, with only eight cases appearing in the literature. Four of the six reports recommended surgical treatment such as excision or open reduction and fixation [1-4], while the remaining two reports recommended conservative observation. Therefore, it remains unclear whether surgical treatment is necessary.

We report a case of sternal segment dislocation in a child. Although the segment had rotated 90°, it was remodeled. We now believe that surgical treatment is not necessary for this condition.

Key words: child, sternal segment dislocation, conservative observation

INTRODUCTION

The sternum is a familiar bone in the field of thoracic surgery. Thoracic surgeons often examine sternal diseases. Of these diseases, sternal skeletal injury is occasionally seen in adults. Sternal skeletal injury is extremely rare in children because of the anatomical structure of the sternum [2, 5]. There have been only six reports of sternal segment dislocation in children [1, 2-4, 6, 7]. However, whether the segment should be treated surgically or left in the dislocated position is still a controversial issue. Perez and Coddington [5] described an unusual fracture of the sternum in a 7-year-old boy, who was successfully treated without surgery. Their experience encouraged us to treat sternal segment dislocation without surgery. We present the case of a child who suffered a dislocation of the sternal segment. Although the segment had rotated 90°, it was completely remodeled within 7 months. A 4-year follow-up of this case revealed excellent results both radiographically and clinically.

CASE

A 10-year-old Japanese boy felt pain when bending backward while playing dodge ball, and visited a nearby clinic. He was diagnosed with sternal fracture and referred to our department the day after the injury. Physical examination revealed tenderness and swelling at the midsternum with no bruises or abrasions. A radiograph revealed dislocation of the third sternal segment of the body of his sternum (Fig. 1). He felt pain, but was followed up as an outpatient because the pain could be sufficiently controlled with an analgesic. Pain as well as tenderness disappeared within a one month. At least two months later, radiography showed that new bone had formed in the superior and inferior

portions of the segment. CT performed 7 months later showed that the dislocated segment had been completely remodeled (Fig. 2). Four years and 6 months after dislocation, there was no abnormality radiographically.

DISCUSSION

Sternal segment dislocation is rare, with only 8 cases appearing in the literature [1, 2-4, 6, 7]. The effects of injury are quite different in children than in adults because of the elasticity of the ribs and sternum. The diagnosis is difficult and may be easily missed because the segments are often initially only slightly dislocated and gradually rotate for approximately 2 weeks. Therefore, dislocation is likely to be misdiagnosed as a fracture, as in this case.

The primary mechanisms are a direct blow, indirect forces, or infection. The forces that cause sternal segment dislocation are not strong enough to produce internal injuries.

Perez and Coddington [5] assumed that indirect forces such as those from coughing, lifting, labor, or tetanus put the thoracic spine in a flexed and compressed position, causing this injury.

In 7 cases [1, 2-4, 6, 7], the site of dislocation was the junction of the manubrium with the sternal body. The high frequency of this site is probably because of the fact that the manubrium is rigid and other sternal segments are elastic. In the present report, dislocation of the third segment was initially reported. However, dislocation of the second segment had also been reported [7]. Thus, dislocated segments could be confirmed.

CONCLUSION

Vascular necrosis has been considered as a cause of this condition, and four of the six reports recom-

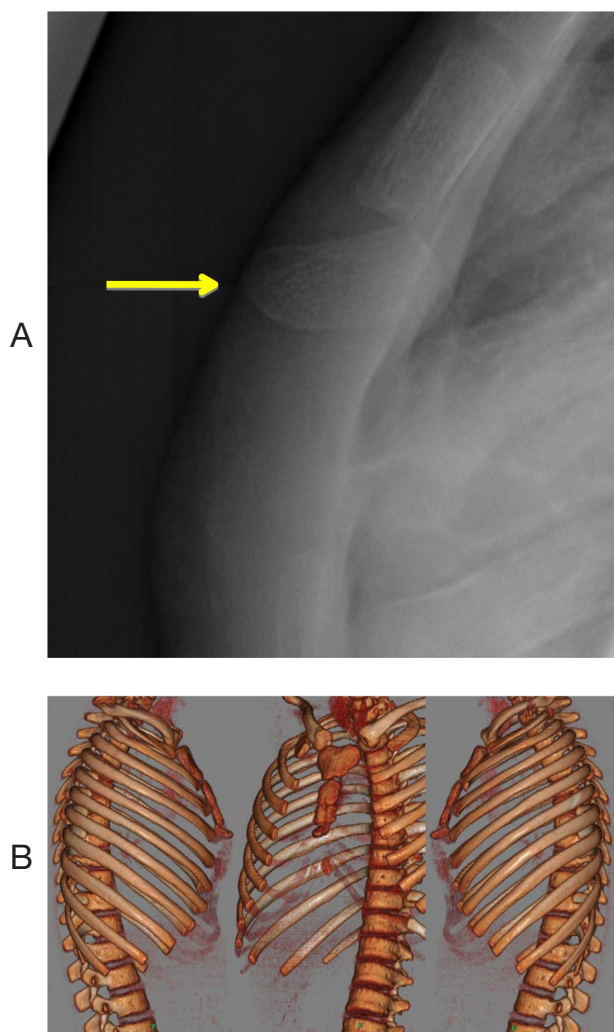


Fig. 1 A) Lateral radiograph of the sternum immediately after injury. Dislocation of the third sternal segment is seen. B) 3D CT of the bony thorax.

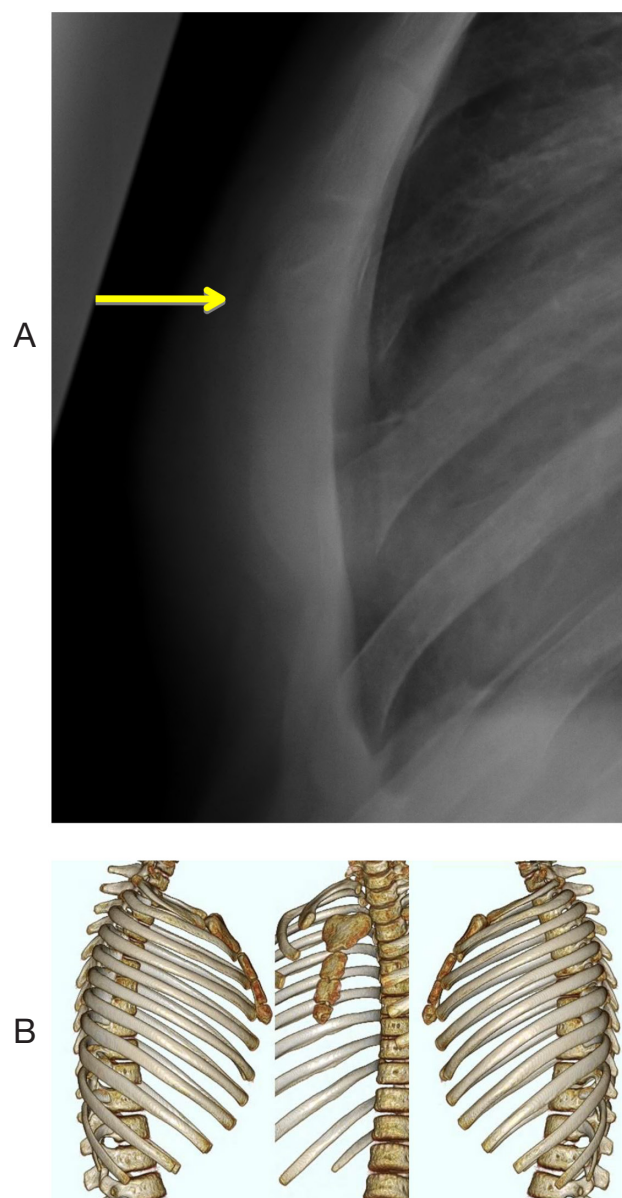


Fig. 2 A) Lateral radiograph of the sternum. Seven months after the injury. The dislocated segment was remodeled. B) 3D CT of the bony thorax.

mended surgical treatment such as excision or open reduction and fixation [1-3, 6]. In our cases, as in two previous report [4, 7], the dislocated segments were rotated but were conservatively remodeled over time. Furthermore, the dislocated segments had completely remodeled within 1-2 years. This shows that surgical treatment is not essential to treat sternal segment dislocation in children.

CONFLICT OF INTEREST

None of the authors have any conflict of interest to be reported.

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