

Development of a Chest Wall Deformity after Conservative Treatment for a Sternal Fracture

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Although sternal fractures are relatively common, treatment has not been clarified. Thus, the authors report a case of a patient with a sternal fracture associated with a thoracic spinal fracture who had received conservative treatment, but the outcome was not satisfactory. [J Trauma Inj 2016; 29: 184-186]

Key Words: Sternum, Wounds, Nonpenetrating, Fracture, Deformity

I. Introduction

Patients with sternal fractures due to trauma account for 3–8% of all blunt trauma patients, mostly due to traffic accident or falls.(1,2) A review of the literature revealed that the majority of cases with isolated sternal fracture received selected non-surgical treatment, and some studies showed that hospitalization itself is questionable when vital signs are stable.(3) However, although many patients continue to have symptoms, such as chest pain after discharge, these symptoms are often overlooked when there is no associated vital sign risk.(4) To this end, the authors report a chest wall deformation in a patient with sternal and thoracic fractures after blunt trauma who underwent non-surgical treatment.

II. Case Report

A 59-year-old male was admitted to the emer-

gency room in a drowsy, semicomatose mental state due to a fall that had occurred 45 min before admission. Blood pressure was 170/100 mmHg; pulse, 103 beats/min; respiratory rate, 24 times/min; and body temperature, 36°C. He had a history of diabetes mellitus and had been taking medication for 5 years. At the time of admission, his blood glucose level was 456 mg/dL, and blood test results showed white blood cell count, 18,700/mm³; hemoglobin, 11.3 g/dL; platelets, 201,000 mm³; creatine kinase-MB, 5.43 ng/mL; and troponin-I, 0.46 ng/mL. An arterial blood gas analysis was normal. An electrocardiogram was normal with a heart rate of 97 beats/min. Coronary angiography was performed due to the high cardiac enzyme levels, and normal findings were observed. Computed tomography (CT) scans of the thorax, abdomen, brain, and cervical and thoracic spine revealed compression fractures of the sternal body, thoracic spine nos. 2, 3, 5, 7, and 12; and lumbar vertebra no. 1 (Fig. 1A). The thoracic surgeon and neurosurgeon treated the patient conservatively

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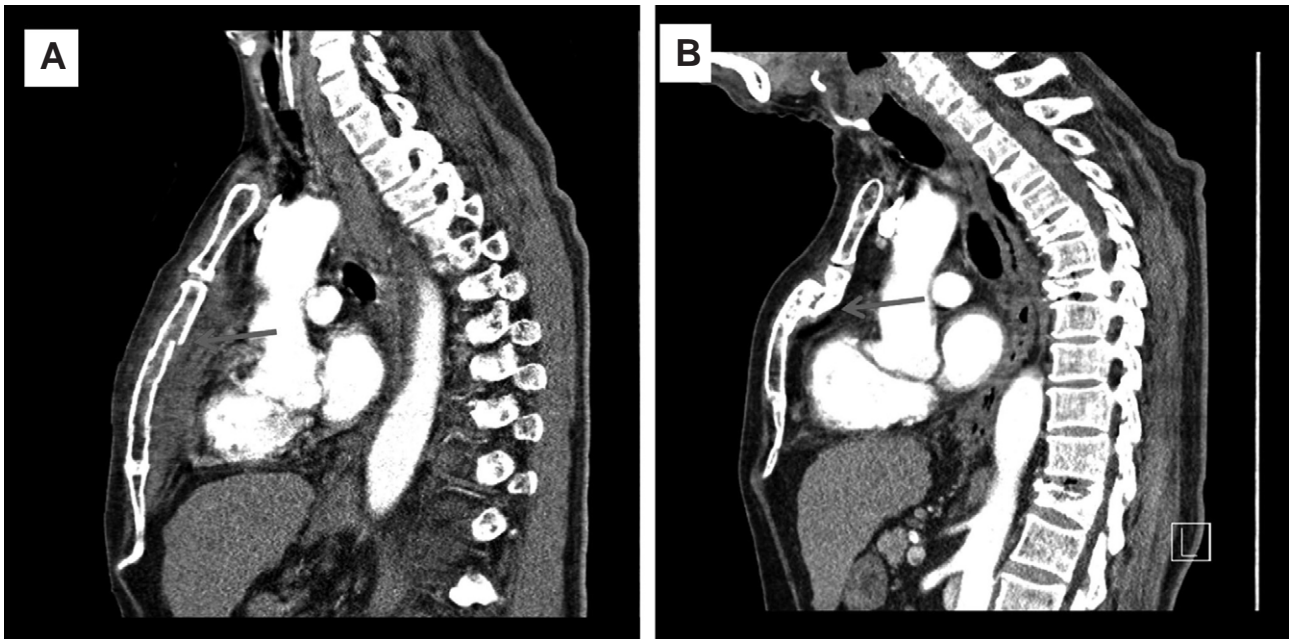


Fig. 1. Chest computed tomography (CT) scan of the patient. Red arrow demonstrating a sternum fracture. (A) Chest CT on admission day. (B) Two year follow-up chest CT.

with a brace because displacement of the injured sternal body was not severe. The patient was discharged on day 38 without any specific findings. The patient complained of discomfort 3 months after discharge due to difficulty breathing. A chest CT scan revealed severe kyphosis, posterior dislocation of the sternum, and a decrease in chest volume. A pulmonary function test confirmed reduced pulmonary function associated with obstructive pulmonary disease (forced expiratory volume in 1 s [FEV₁], 1,66 L (56%) and FEV₁/forced vital capacity, 85.13). A concurrent surgery together with a neurosurgical operation was planned for 2 years later to improve the respiratory distress symptoms, but the patient was skeptical of the operation and is currently under prognostic observation through the outpatient unit (Fig. 1B). In addition, the possibility of surgery was further deteriorated due to hepatocellular carcinoma and its deterioration found during follow up.

III. Discussion

Traumatic sternal fractures range from a single sternal fracture to injuries involving other organs that cause serious problems, including cardiac injury.

Most centers provide conservative treatment for such injuries and prescribe analgesics and bed rest if the patient has no major concurrent injuries, such as cardiovascular damage. This scenario occurs often, even if severe chest pain is included, and often becomes the subject of surgical treatment only if accompanied by dislocation of the fracture site, flailing chest, or dyspnea. Most hospitals do not surgically treat a sternal fracture, and each hospital provides treatment based on their experience. However, surgical fixation of a sternal fracture can cause major complications following nonunion of the fixation site.⁽²⁾ The use of plate and screws to fix the plate on the anterior surface of the sternum is preferred rather than sternal surgery using steel wires.^(5,6)

However, spinal injuries are associated more frequently with sternal fractures after a thoracic injury, and the role of surgical treatment is being overlooked despite its advantages.^(7,8)

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