=Abstract=

Traumatic Funnel Chest due to Blunt Trauma
-A Case Report-

Kyu Seok Cho, M.D.*, Soo Chul Kim, M.D.*, Seung Kook Ahn, M.D.*, Dong Won Kim, M.D.*

This 51 years old male patient was admitted to the department of thoracic and cardiovascular surgery via OPD because of anterior chest pain. 7 days ago before admission, he got the chest trauma after traffic accidents, the lateral chest roentgenogram showed complete transverse sternal fracture. He also complained of mild dyspnea. We also noticed that he had depressed anterior chest wall. It looks like funnel chest. The operative findings revealed dislocated & callus formations at the both 4th and 5th costochondral junction and transverse fracture of sternal body between 4th and 5th costochondral junction, the upper end of sternal fracture was situated below the lower end of sternal fracture. The two ends of sternal fracture were situated at the same level and reapproximated the two ends by two-interrupted wire sutures. The patient is well on the road to recovery after the operation.


**Key words**: 1. Flail chest  
2. Chest trauma  
3. Funnel chest

**Case Report**

The 51 years old male patient was admitted to the department of Thoracic and Cardiovascular surgery via OPD because of dyspnea and anterior chest discomfort with painful sensation onto the clothes for 7 days. 7 days ago before admission, he was injured by the in-car accident. The other car crossed the midline of the road & hitting on the front of his car at that time, he was driving the car with fastened seat belt, he was injured from direct impacts with steering column on his anterior chest. So, he had depressed anteromedial chest after the blunt trauma. The depressed anteromedial chest looks like funnel chest. It also revealed moderate flail in the anterior chest. The lateral chest films showed transverse sternal fracture (Fig. 1). The echocardiogram demonstrated normal global and regional function of the heart. The enzyme studies including Lactic dehydrogenase (LDH), Glutamic oxaloacetic transaminase (GOT) and Creatine phosphokinase (CPK-MB) showed within normal limits. So, We decided to correct the depressed anterior chest by operative method. The operative
findings revealed callus formations at the both 4th and 5th costochondral junction and transverse fracture of sternal body between both 4th and 5th costochondral junction (Fig. 2). The upper end of sternal fracture was situated below the lower end of sternal fracture. The upper end of the sternal fracture elevated by periosteal elevator, and two interrupted wire sutured were applied on tranverse sternal fracture and reapproximated the two ends of sternal fractures(Fig. 3). The patient is well on the road to recovery after the operation.

Discussion

Sternal fractures most commonly occur in automobile accidents and from direct impact to the anterior chest. However, severe flexion injuries of the vertebrae may also produce sternal fracture. With aseal belt use without shoulder restraint, there is frequently both a sternal and a vertebral injury as the body bends forward on deceleration both traumatic rupture of the aorta and rupture of liver are common in this type of deceleration.

Sternal injuries are commonly associated with costochondral dislocations of multiple ribs and therefore, with flail chest. If someone got sternal injuries, he or she should always suspect rupture of a bronchus, rupture of major arteries and myocardial injury, because the heart is compressed between the sternum and the vertebrae. The most common sites of sternal fracture are transversely at the junction of the manubrium and body, and transversely through the body.

The diagnosis of the sternal fracture is made easily by physical examination. The sternum is below the subcutaneous layer, so, it is easily palpated and the fractured fragments be felt by fingers. Flail chest is an unstable chest wall. Anterior flail chest usually results from direct impact such as with the steering column, severe compression such as being run over by a vehicle.

Treatment of sternal fracture consists of primary atten-
tion to associated injuries.

Analgesics and even local injections of anesthetics are needed, sternal fractures are best managed by early fixation of the sternum by direct wiring. The use of substernal pins & towel clips fixation methods are not used at this time because of time consuming, highly got infected chance and patients can’t be ambulated for a long time. If the patients are managed by early fixation of sternum, there is no need to endotracheal intubations and ventilator², ⁵, ⁶.

References

3. 조규석. 홍부외상의 원인 분석. 대한외과학회지 1993; 6: 191-4