

Pane of the Sternal Manubrium-Case ReportGandji Elohonnan Wilfried^{1*}, Attolou Serge Gilles¹, Natta N'tcha Habib Done¹, Guezo Melissa Olivia¹, Timnou Bekouti Jean², Mehinto Kuassi Delphin¹¹Visceral surgery department of the Hubert Koutoukou Maga Cotonou Benin University Hospital Center²Hospital Center of Dax France***Corresponding author**

Gandji EW

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Abstract: Sternal fractures are rare and mainly caused by a direct impact on the anterior aspect of the thorax. In most cases, sternal fractures are treated conservatively. However, if the patient has symptoms such as refractory wall pain or bone cracking due to sternal instability, surgical correction is indicated. No consensus exists as to the most appropriate surgical method. We report a case of sternal fracture treated surgically by steel wires at the Hubert Koutoukou Maga Cotonou University Hospital Center (Benin). This is a 28-year-old patient admitted for persistent chest pain triggered by cough and dyspnea following a traffic accident. The examination showed a paradoxical breathing, a pain caused by palpation of the thorax. Radiological investigations revealed a stepped fracture of the sternal manubrium with 3cm overlap of the distal segment and sternal debridement with staged transverse fracture of the sternum. He benefited from osteosynthesis with steel wire. The evolution was favorable with hemodynamic and respiratory stability with a good clinical and radiographic reduction.

Conclusion: Surgery with blood reduction and internal fixation with steel wire in sternal fractures is a safe and effective therapeutic strategy.

Keywords: Sternum, Chest trauma, Fracture fixation, Steel wire.

INTRODUCTION

The sternum is a long, flat, vertical bone located on the anterior aspect of the thorax and on which attaches on both sides the costal cartilages which prolong the ribs.

The sternal component is defined by any parietal segment separated from the rest of the wall by one or more series of staged fractures [1].

Sternal fracture is rare, is due to severe direct trauma of the thorax. It occurs much more frequently in people over 60 because of the rigidity of the wall. The indication of the surgical treatment arises for little sternal fracture [2, 3]. We report to you a case of sternal limb made of a bifocal fracture displaced from the sternal manubrium

OBSERVATION

This is a 28-year-old patient with no particular personal or family history who had consulted for chest pain triggered by cough and dyspnoea all evolved for 7 days, following a self-pedestrian-type traffic accident (a truck - the patient is walking on a sidewalk). He was hospitalized in a hospital center in a polytrauma chart.

The persistence of the symptomatic motivates consultation in visceral surgery CNHU HKM for better care. Examination at the entrance showed demabrasions on the anterior aspect of the thorax, paradoxical breathing, pain caused by palpation of the thorax. The lung fields were free and the cardiac examination was peculiar.

The chest x-ray frontal incidence was within the normal range that of profile allows noting a stepped fracture of the sternal manubrium with 3cm overlap of the distal segment. Cardiac ultrasound was normal. The thoracic chest scans sternal insertion with staged transverse fracture of the sternum.

He benefited from osteosynthesis with steel wire. In fact, after roughening of the osseous banks, reduction of the tire lever by maneuver, drilling of 4 points of passage at the square tip at 1 cm from the fracture site: 2 points at the upper segment and 2 points at the lower segment and the installation of a steel wire n ° 6 making it possible to realize a point in X.

The evolution was favorable with hemodynamic and respiratory stability with a good clinical and radiographic reduction.

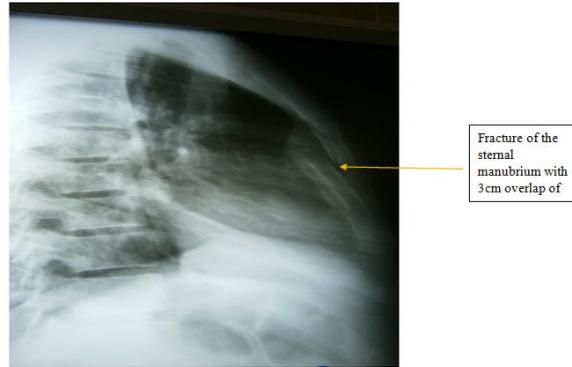


Fig-1: Standard radiograph of profile showing a stepped fracture of the sternal manubrium with 3cm overlap of the distal segment

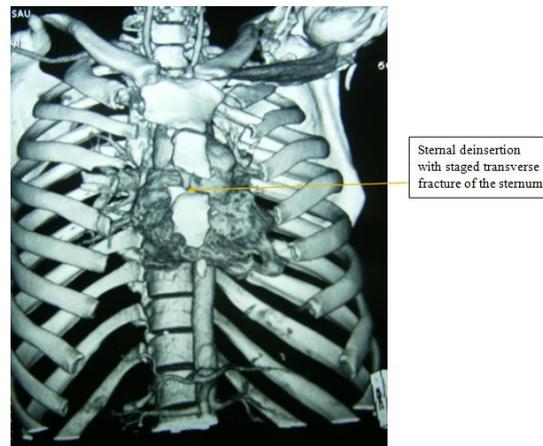


Fig-2: Thoracic CT scan showing sternal deinsertion with staged transverse fracture of the sternum

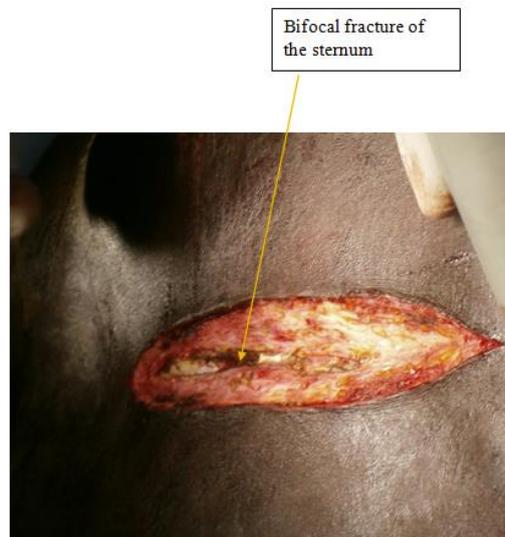


Fig-3: Preoperative view showing the bifocal fracture of the sternum



Fig-4: Intraoperative view showing the passage of steel wires

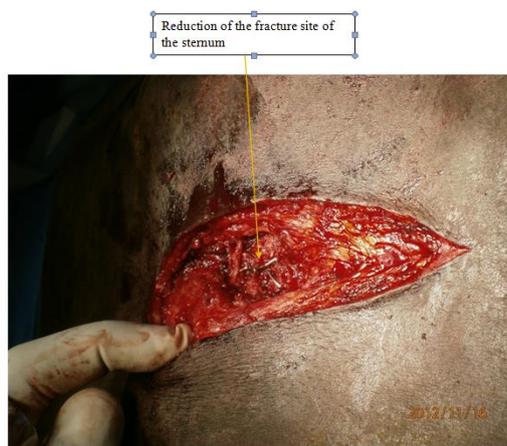


Fig-5: Peroperative view showing the reduction of the fracture site of the sternum

DISCUSSION

The thoracic component represents 9 to 15% of thoracic traumas, but the sternal fracture represents 0.45% to 4% of emergency department admissions [4]. Thus, the sternal aspect is rare according to the literature review.

The main cause of instability of the chest wall is due in 70% of the cases to an accident of the public road [5,6]. The mechanism of this accident is usually a direct shock and all in a context of polytrauma like that of our patient. Our patient had an alteration of the parietal ventilatory mechanics but without any repercussions on the respiratory function that could explain the delay to the diagnosis and the management

because it is the radiological explorations which allowed making the diagnosis, to eliminate others associated lesions and to pose the surgical indication as shown by other authors [7,8].

Surgical indications remain highly debated and school-based and sometimes controversial, especially since only a few studies have compared the results of the two most commonly used techniques, namely prolonged mechanical ventilation and costal plate fixation osteosynthesis [9].

Surgical fixation of the sternum is performed in a very limited number of patients, as only a few patients have signs of instability related to sternal

fracture, such as severe dislocation of the fractured site or anterior displacement of the sternum [10].

We had done osteosynthesis with steel wire, after bony edge reduction, reduction by maneuvering the tire lever, drilling of 4 points of passage at the square tip at 1 cm from the fracture site at the level of the upper segment and the segment inferior and passage of a steel wire n ° 6 making it possible to realize a point in X.

The evolution was simple and the patient was put in exead on D3 with a satisfactory radiological control at the first month and the sixth postoperative month. This osteosynthesis with steel wire by the maneuver of the tire changer seems and considerably decreases the duration of stay of hospitalization could be used in our developing countries.

CONCLUSION

The technique of the tire changer and osteosynthesis with steel wire for the treatment of the sternal shutter are sures less expensive and uncomplicated techniques. State of current knowledge on the subject.

Sternum fracture is a rare condition and is caused by a violent shock. Lack of consensus on his care.

Contribution of our study to knowledge

It confirms the rarity of cases of fracture of the sternum; the difficulty of asking the diagnosis. The support is possible and adequate.

Conflicts of interest

Authors do not declare any conflict of interest.

Authors' Contributions

All authors participated in all stages of the development of this manuscript. All have read and

approved the final manuscript which is submitted for publication.

REFERENCES

1. Jancovici R, Pons F, Dubrez J, Lang-Lazdunski L. Surgical treatment of thoracic traumas (II). Encycl Med Chir (Elsevier SAS, Paris), Techniques Surgical - Thorax, 42-445-B, 1997: 22p.
2. Kalicke T, Feil E, Steuer K, Hansis M. Manubriosternal dislocation caused by indirect flexion-compression trauma. A case report and review of the literature. Unfallchirurg (2001) 104(3):257–260.
3. Kalicke T, Frangen TM, Muller EJ, Muhr G, Hopf F. Traumatic manubriosternal dislocation. Arch Orthop Trauma Surg (2006) 126(6):411–416.
4. Gökhan Ergene , Cumhuri Murat Tulay, Hüseyin Anasız, Sternal Fixation with Nonspecific Plate. Ann Thorac Cardiovasc Surg 2013; 19(5): 364–367.
5. Liman ST, Kuzucu A, Tastepe AI, Ulasan GN, Topcu S. Chest injury due to blunt trauma. Eur J Cardiothorac Surg 2003;23(3):374-8.
6. Sirmali M, Turut H, Topcu S, Gulhan E, Yazici U, Kaya S, et al. A Comprehensive Analysis of traumatic rib fractures: morbidity, mortality and management. Eur J Cardiothorac Surg 2003; 24(1):133-8.
7. Lopez FM, Metge L, Vivens F, Estorc J. Contribution of imaging in closed traumas of the thorax. Rev Prat 1997; 47: 958-63.
8. Azorin J, Lamour A, Hoang PH, et al. Severe chest injuries. Encycl Med Chir(Elsevier SAS, Paris), Emergencies, 1987; 24-117-D-10 .; 20p.
9. Marcel A. Gloyer • Hans-Curd Frei •Thomas K. Hotz • Kurt P. Ka"ch. Osteosynthesis of traumatic manubriosternal dislocations and sternal fractures with a 3.5/4.0 mm fixed-angle plate (LCP) Arch Orthop Trauma Surg 2011;131(1):1261–1266.
10. Henley MB, Peter RE, Benirschke SK, Ashbaugh D. External fixation of the sternum for thoracic trauma. J Orthop Trauma 1991; 5(4):493–497.