

Unexpectedly Complicative Course of a Rib Series Fracture in Patient with Chilaiditi Syndrome

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Background

1910 described by D. Chilaiditi, the Chilaiditi sign refers to the interposition of liver and colon parts with air-filled intestinal sections below the right diaphragm. If this anatomical abnormality becomes clinically symptomatic, it is called Chilaiditi syndrome [1]. Diaphragmatic injuries are rare, accounting for less than 1% of all traumatic injuries [2], but increase the risk of herniation and strangulation of intra-abdominal organs when diagnosed late. They are associated with an overall mortality rate of 25% [3], although this strongly depends on the respective accompanying organ injuries.

Keywords: Chilaiditi; Emphysema; Rib Fracture; Trauma

Case History

An 84-year-old patient presented to our emergency center after a fall in a home environment with right-sided thoracic pain and increasing dyspnea. Due to a right-sided rib series fracture (Figure 1) with pneumothorax, thoracic drainage was created by minithoracotomy for digitally controlled positioning.

The patient was transferred to the intensive care unit with cardiopulmonary stability. In the course of the stool and intestinal contents clearly emptied via the drainage, so that the indication for immediate laparotomy was made. There was a perforation of the right colon flexure measuring about 1 cm, which was immediately sub-phrenic in the sense of a Chilaiditi syndrome (Figure 2a/b).

The cause was a dislocated, fractured rib, which had led to a small defect of the diaphragm (Figure 3) with subsequent injury to the intestinal wall. After colon segment resection with attachment of an anastomosis anus praeters and transabdominal over-stitching of the diaphragmatic defect, thoracotomy was performed with extensive lavage of the right half of the thoracic in fecal pleural empyema. Postoperatively, the patient stabilized under intermittent noninvasive ventilation and daily flushing of the chest drains. In the course of both drains were removed. After almost complete convalescence, however, there was a sudden onset of respiratory insufficiency - most likely in fulminant pulmonary artery embolism - from which the patient died under resuscitation.

Conclusion

The Chilaiditi sign as such has no disease value, but in trauma patients the risk of intestinal injury is increased. A Chilaiditi sign can lead to the misdiagnosis of diaphragmatic rupture. If available, radiological or sonographic preliminary examinations should be used for comparison. It is obvious that the risk of intestinal perforation is increased in the presence of a Chilaiditi sign. A

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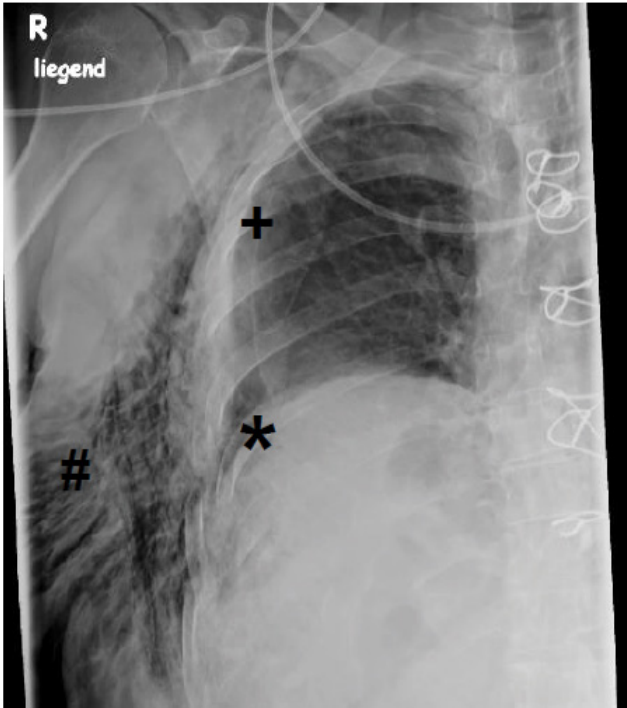


Figure 1: Initial hemithorax image showing the rib series fracture (*), pneumothorax (+) and soft tissue emphysema (#). The Chilaiditi sign is not present here.

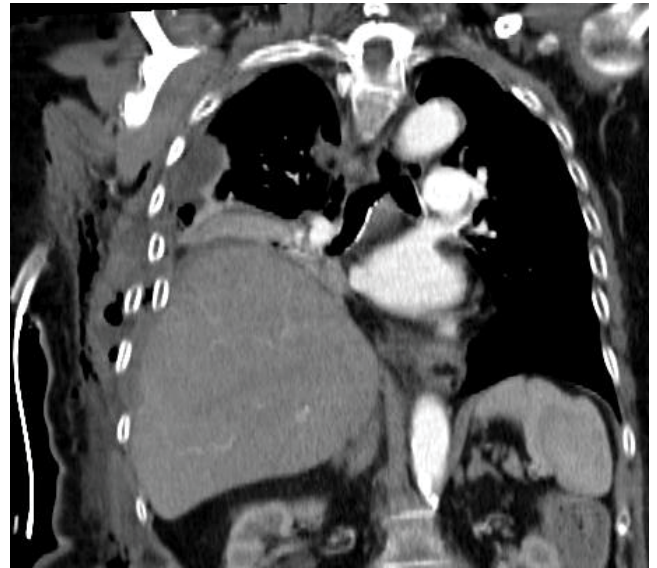


Figure 2b: Coronary reconstruction of the thorax. Displaced fracture of the right 7th rib with close position reference of the medial fragment to the liver. Perihepatic low free fluid. Undescended diaphragm on the right, partial atelectasis of the lower lobe of the lung.

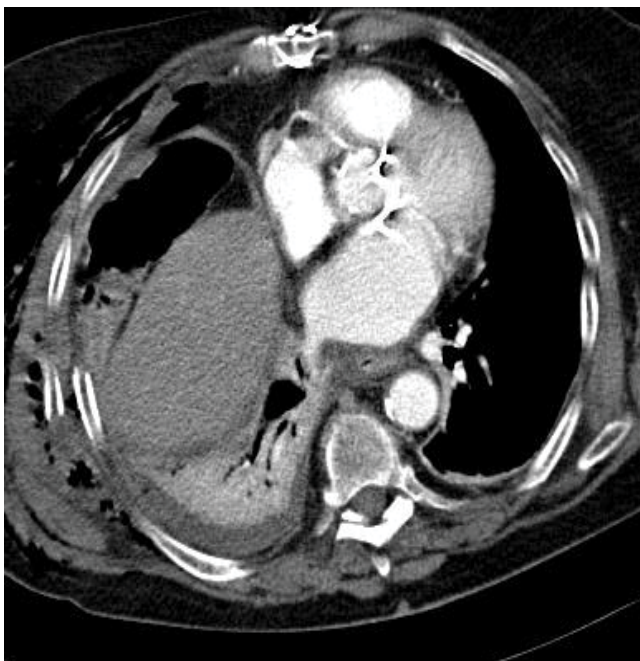


Figure 2a: Transverse section through the thorax in the arterial phase after IV KM administration. Dislocated fracture of the right 7th rib with puncture of the proximal fragment through the diaphragm, here close position reference to the liver and the ventrally adjacent colon. Soft tissue hematoma and emphysema, dorsal pleural effusion with partial atelectasis of the lower lobe.

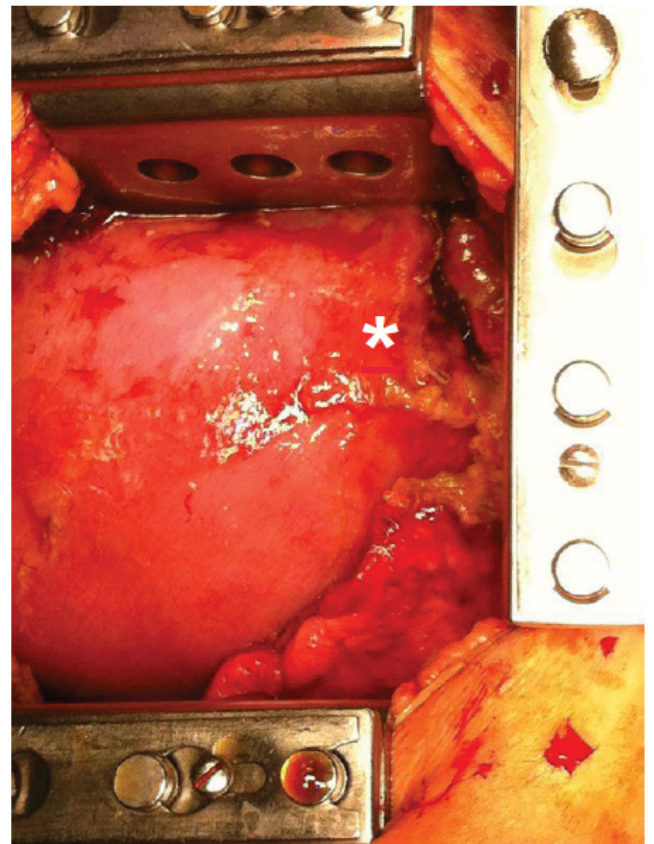


Figure 3: Intraoperative findings showing the diaphragmatic defect caused by a fractured rib (*). The oversewing of the defect of abdominal as well as an extensive irrigation of the thoracic cavity with several liters of NaCl has already taken place here.

diaphragmatic injury must be considered in case of blunt or penetrating trauma in the area of dermatomes T4-T12. A radiological exclusion of such a system is never certain. If diagnosed, surgery is mandatory. Even in the case of a high degree of suspicion, exploration should be sought.

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