Archives of Current Medical Research
Arch Curr Med Res 2024;5(3):117-119

Received: 12 July 2024
Revised: 20 September 2024
Acccepted: 27 September 2024
DOI: 10.47482/acmr.1515039

ORIGINAL ARTICLE

Rare complication of RIB fracture and fixation with non-classical method

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Abstract

The vast majority of all chest traumas are blunt traumas. In blunt traumas, serious intrathoracic intrapleural complications such as pneumothorax, hemothorax, hemopneumothorax may be observed whether or not accompanied by rib fractures, and in some cases, thoracic wall hemorrhages may be observed rarely at a level that severely impairs vital signs. In our case, we presented a patient who developed secondary to multiple rib fractures, no intrapleural complications were observed, vital signs were severely impaired due to diffuse bleeding in the serratus anterior muscle, which was a very rare complication, and we performed rib fixation with an intrathoracic extrapleural approach as a non-classical method.

Key words: Cataract, Non-classical, Rib fixation, Rib fracture.

Cite this article as: *Başkan M, Rare complication of RIB fracture and fixation with non-classical method. Arch Curr Med Res. 2024;5(3):117-119*

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INTRODUCTION

Blunt traumas constitute 70% of all chest traumas and require a multidisciplinary approach because they involve many organs including ribs, lung, pleura, heart, great vessels, diaphragm and mediastinal structures (1). Serious complications such as pneumothorax, hemothorax, lung contusion or other organ injuries may develop and mortality is relatively high (2). Multiple rib fractures that develop after a relatively low-energy trauma should not be ignored and it should be kept in mind that intensive care follow-up and surgical planning may be required. In terms of surgical technique, rib fixation can be performed with the intrathoracic extrapleural approach and non-classical method in appropriate cases (in cases where complications such as pneumothorax, hemothorax, etc. are not observed), giving priority to the area where complications develop.

CASE REPORT

A 53-year-old male patient was admitted to the emergency department with pain and progressive swelling in the right posterolateral region that started about 1 hour ago after lifting the refrigerator at home. He stated that he had no known comorbidities and his symptoms were gradually increasing. Initial vital signs were TA: 100/60 mmHg, pulse rate: 100/min, respiratory rate: 16/min, oxygen saturation: 96%. The patient's blood results showed that hemoglobin:13.3, serum biochemistry and coagulation parameters were within normal limits. Physical examination of the patient revealed a cystic lesion approximately 20 cm diameter under the scapula on the right posterior-lateral side with ecchymosis areas and increased tenderness with palpation. Posterior-Anterior Chest X-Ray (PA CXR) was performed as a first imaging modality. PA CXR showed multiple rib fractures on the right posterior-lateral side and increased opacity in the same area. Thorax Compited Tomography, one of the advanced imaging modalities, was ordered. Thorax Compited Tomography showed displaced fractures in the posterior-lateral aspect of the 5th-6th-7th-8th ribs on the right and diffuse hematoma areas in the serratus anterior muscle (figure-1). The patient was admitted to the 3rd level intensive care unit for follow-up and closely monitored vitally. An operation was planned for rib fixation and hematoma evacuation under elective conditions, but deterioration in vital signs in the 1st hour of hospitalization (TA: 70/50 mmHg, pulse rate: 140/min, respiratory rate: 22/min, oxygen saturation: 94%) and Hemoglobin: 8.1, he was operated under emergency conditions. After intubation in the operating room, the patient was placed in the prone position and the rib fractures in the posterior-lateral area were detected by palpation, marked on the skin, and a skin incision of approximately 10 cm in the vertical axis was opened and the skin, subcutaneous tissue, muscle tissue were passed respectively and the hematoma area was reached. 2500 ml of hematoma was drained and bleeding areas were controlled with cautery and 2/0 vicryl. Leaking bleeding areas were observed from the fracture areas of the 5th-6th-7th ribs and controlled with cautery. When it was observed that the existing fractures were not exposed to the thorax, the parietal pleura was removed from ribs 5-6-7 with a retractor and rib fixation was performed extrapleurally with titanium hook fixators. Air leakage was checked by flushing with saline, and when it was observed that there was no air leakage, a hemovac drain was placed in the muscle and the layers were closed in the anatomical plan without any chest drain in the intrathoracic area. The patient was given 3 units of erythrocyte suspension intraoperatively. The patient was transferred to the postoperative intensive care unit. Postoperative PA CXR was observed (figure-2). The patient's vital signs improved markedly. On postoperative day 1, 400 ml/day, on postoperative day 2, 200 ml/day, and on postoperative day 3, 50 ml/day, a total of 650 ml was drained from the hemovac drain and the hemovac drain was terminated on postoperative day 4. The patient was discharged on postoperative day 5. No complication was observed in the patient who came to the 1st week follow-up after discharge.

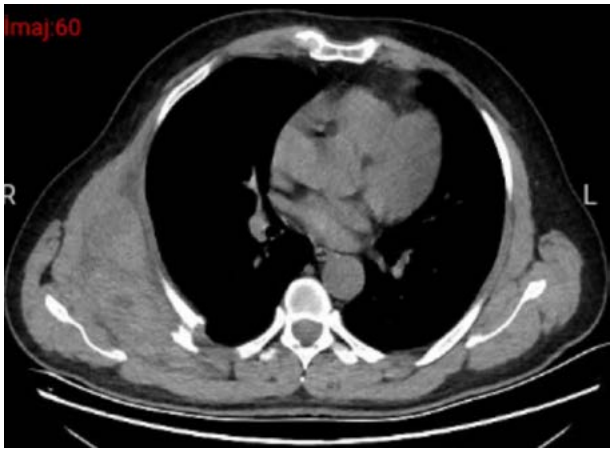

Figure 1: Rib fracture and hematoma on the right serratus anterior muscle.

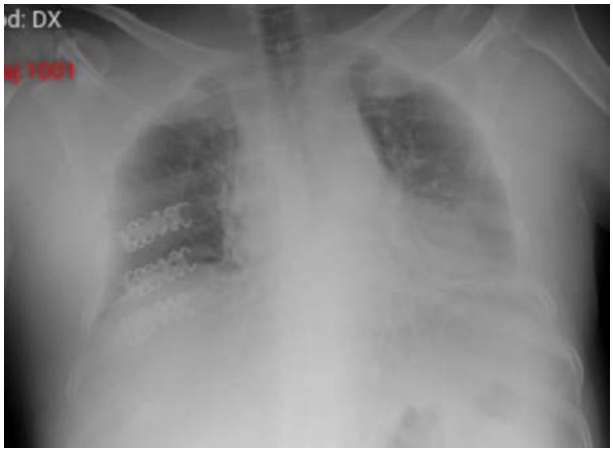

Figure 2: PA CXR on postoperative day 0 (3 ribs were fixed and only a Hemovac drain was placed without a chest tube).

DISCUSSION

The clinical picture of complications of blunt trauma to the chest ranges from simple soft tissue injury to life-threatening injuries. Thoracic trauma is more common in males. In a study conducted in our country, the mean age of patients with thoracic trauma was 41±16 years (3). Our patient was a 53-year-old male patient with a life-threatening injury.

In patients with thoracic trauma, PA CXR is the first imaging method to be used in determining the severity of trauma, providing early triage, deciding on surgical operation and determining the need for further imaging (4). In the first presentation of our patient, PA CXR was ordered and Thorax Computed Tomography was ordered as a further investigation as a result of radiologic imaging and clinical evaluation.

Common complications in thoracic traumas include pneumothorax, hemothorax, hemopneumothorax, lung contusion and rib fractures. Rib fractures are observed with a rate of 29-75% (3). In our case, multiple rib fractures developing after thoracic trauma and bleeding in the serratus anterior muscle, which is a very rare complication, were observed.

Landinois et al. defined 4 indications for surgical stabilization (4): Respiratory failure despite aggressive medical treatment, flail chest with a large surface covering the anterior and lateral parts of the thoracic wall, inability to wean from mechanical ventilation, and thoracotomy performed for another indication. Our case was operated for hematoma evacuation, bleeding control and rib fixation.

Early rib fixation is indicated in selected elderly patients without severe pulmonary contusion and respiratory failure. With fixation, many complications are prevented and treatment costs are significantly reduced (5). Our patient was operated 2 hours after the first admission to the hospital and more mortal complications were prevented.

Bille et al. reported that rib fixation with titanium plates was effective, safe and had good long-term results (6). In our patient, rib fixation was performed with titanium hook fixators, which are safe and effective.

In conclusion, we presented that rib fixation is a safe and effective procedure not only for flail chest, pulmonary and pleural pathologies, displaced multiple rib fractures causing excruciating pain, but also for the repair of rib fractures causing intramuscular hemorrhage, that bleeding in the serratus anterior muscle can be added to the rare complications of rib fractures, and that rib fixation can be technically applied intrathoracic extrapleural in selected patients.

Declarations

The authors received no financial support for the research and/ or authorship of this article.

There is no conflict of interest. Ethical committe approval is not required because of this article is a case report. Informed consent was obtained from patient.

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