

# Case Report

## Traumatic pulmonary pseudocyst

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Traumatic pulmonary pseudocyst is a rare lesion and is typically seen after blunt chest trauma. Although secondary infection is an uncommon complication, it presents high morbidity and requires immediate treatment. A 28-year-old male motorcycle accident victim was admitted to the hospital with hemoptysis, chest pain, dyspnea and hypoxemia. Computed tomography of the chest revealed pulmonary infiltrate and pseudocysts in the lower lobe of the right lung. The patient developed fever, purulent expectoration and an air-fluid level within the pseudocysts. After culture collection, a course of broad-spectrum antibiotics was started. Clinical improvement was observed, and the patient was discharged 15 days after admission.

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**Key words:** Chest trauma. Pseudocyst

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### INTRODUCTION

Chest trauma is the main cause of mortality in polytraumatized patients. It has been implicated directly in 25% of fatal cases and indirectly in another 25%. Approximately one-third of all chest trauma cases require hospitalization<sup>(1)</sup>.

The main mechanism of injury in blunt chest trauma is rapid deceleration, which may result in the laceration of the lung parenchyma. In this area there is the formation of a hematoma, which, when in

communication with the airways and resulting in blood drainage, will lead to the formation of a pseudocyst<sup>(1-3)</sup>.

Since this type of lesion presents no epithelial wall, we should refer to it as a pseudocyst rather than a cyst. The term pulmonary laceration, previously used to describe such lesions, should be reserved for cases of severe parenchymal laceration, including visceral pleura rupture aggravated by persistent bleeding and air leakage<sup>(4)</sup>.

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**CASE REPORT**

A 28-year-old male motorcycle accident victim presented to the emergency room with hemoptysis, chest pain, dyspnea and hypoxemia. A chest X-ray revealed scapula fracture, posterior fracture from the first to the eighth right costal arches and pulmonary infiltrate in the lower lobe on the same side. A computed tomography (CT) scan of the chest revealed, in addition to the radiographic findings, images consistent with cysts in the lower right lobe (Figure 1). Arterial blood gas analysis revealed hypoxemia, and blood testing revealed leukocytosis with a shift to the left (16,600 leukocytes and 60% rods). Levels of the muscle enzymes creatine phosphokinase and myoglobin were high (1187 and 737, respectively). Electrocardiogram and echocardiogram results were normal, as were those from all other laboratory tests. The patient was admitted to the semi-intensive care unit and was given oxygen through a face mask while receiving intravenous and peridural anesthesia.

Five days after admission, the patient developed fever and purulent expectoration. A second CT scan of the chest revealed improvement of the pneumothorax, decreased condensation in the lower right lobe and pseudocysts with an air-fluid level in the same lobe (Figure 2). After blood, urine and sputum cultures had been collected, a course of antibiotics (amoxicillin + clavulanic acid and ciprofloxacin) was started. In the sputum culture, growth of  $\beta$ -hemolytic Streptococcus was observed. On day 15 after admission, the patient presented clinical improvement and normal laboratory exams and was discharged. The CT scan performed on the day of discharge revealed significant clinical improvement in relation to the preceding exam (Figure 3).

**DISCUSSION**

Blunt chest traumas are more common than penetrating traumas and generally result from car accidents or falls<sup>(2)</sup>. In the present case, we described a patient with blunt chest trauma resulting from great kinetic energy, characterized by the presence of fractures in the first and second back arches and scapula<sup>(5)</sup>. Due to the severity of the trauma, characterized by the fractures seen in the X-ray and by the hypoxemia presented, a CT scan was performed in the initial evaluation of the patient. This exam is more sensitive than chest X-



Figure 1 – First computed tomography scan, performed on the day of the trauma, showing condensation in the lower right lobe and images consistent with the interposition of cysts.

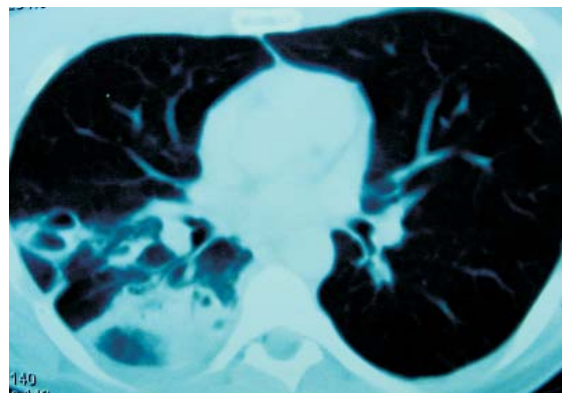


Figure 2 – Second computed tomography scan, performed on day 5 after the trauma, showing infiltrate in the lower right lobe, pseudocysts and an air-fluid level.

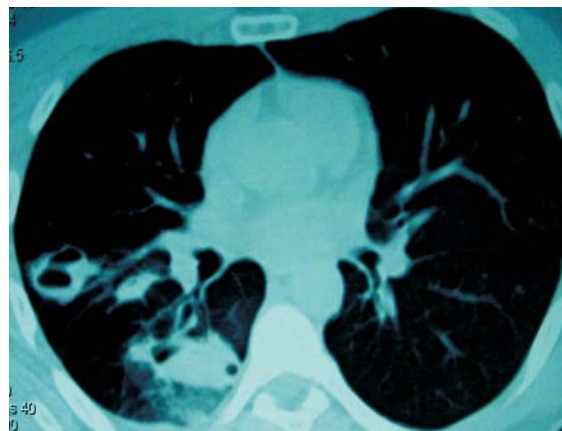


Figure 3 – Third computed tomography scan, performed on day 15 after the trauma, showing significantly reduced infiltrate in relation to the previous exam.

rays in diagnosing lesions of the lung parenchyma. However, the use of this exam does not translate to a statistically significant improvement in the prognosis for these patients, and its routine use for all victims of blunt chest trauma is still controversial<sup>[5,7]</sup>.

Although the first and second costal arches were fractured, the patient was not submitted to arteriography. Recent studies have shown that this exam should only be performed when there is evidence of distal vascular insufficiency, radiographic images suggestive of injury to the aortic arch, apical hematoma, injury to the brachial plexus or substantial dislocation of fracture fragments, all conditions that did not appear in the present case<sup>(1)</sup>.

The CT scan of the chest allowed early detection of multiple small pseudocysts in the area of the pulmonary contusion. Although rare – occurring in only 2.9% of all cases of trauma to the lung parenchyma and 0.34% of chest trauma cases – traumatic pulmonary pseudocysts should always be considered in cases of severe pulmonary contusion. Such lesions result from lacerations of the lung parenchyma in communication with the airways and typically develop within the first week after the trauma. They are generally found near the area of the contusion and their size and shape may vary over a short period of time. Traumatic pseudocysts are more frequent among young adults due to the greater flexibility of the chest, which transmits kinetic energy more efficiently to the subjacent pulmonary parenchyma<sup>(3,4)</sup>.

On day five after admission, the patient developed fever and purulent expectoration. The suspicion of secondary infection of the pseudocyst prompted the immediate collection of cultures and the initiation of a course of broad-spectrum antibiotics, the response to which was excellent.

One to two weeks after the trauma, the pseudocyst begins to diminish, although secondary infection of these cavities might inhibit such improvement<sup>(3,4)</sup>. Despite the fact that this is an uncommon complication, it significantly worsens morbidity in such patients. In general, a course of antibiotics alone is not sufficient to treat infected pseudocysts. It is often necessary to drain the cavity with a catheter and, in some cases, to perform a lobectomy through thoracotomy or thoracoscopy<sup>(4,8)</sup>.

In conclusion, despite being very rare, traumatic pseudocysts should always be considered in patients who are victims of severe blunt chest trauma. Although secondary infection of the pseudocyst is an uncommon complication, it causes considerable morbidity in such patients. When this complication is suspected, treatment should be initiated as soon as possible.

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