CLINICAL VIGNETTE

Spontaneous Resolution of a Large Pneumothorax: A Case Report

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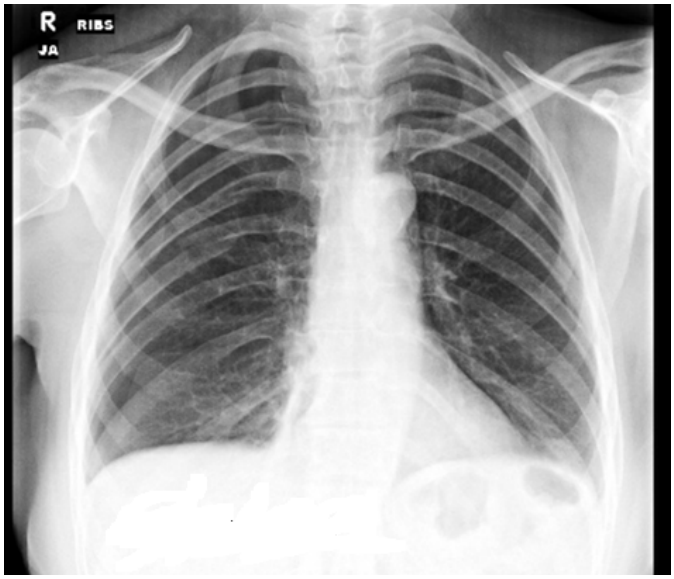
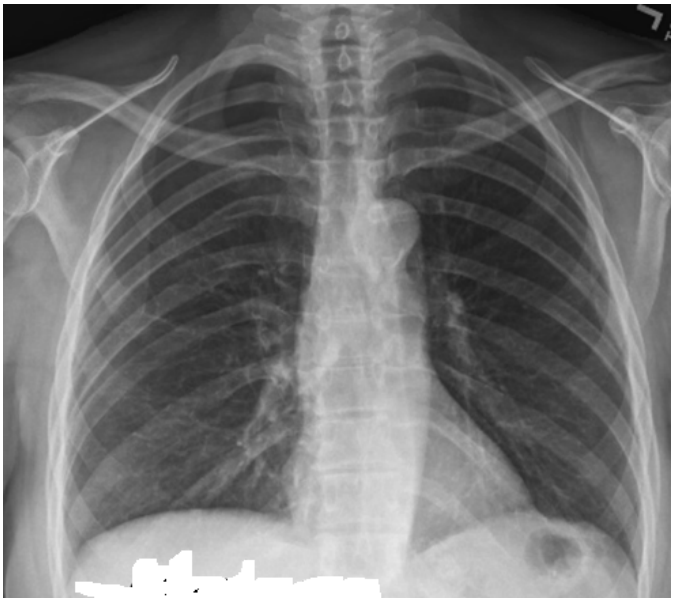
Case Presentation

A 56-year-old Caucasian female with prior 30 pack-year history of tobacco use, presented to the office with right-sided chest pain. Ten days prior, she noted chest pain after falling off a horse. Past medical history included hypertension, but no significant COPD despite prior extensive tobacco use. The pain in the right chest had persisted although lessened in intensity. She was seen at a local urgent care and chest radiograph showed displaced fractures of the 6th and 7th right ribs and a large right-sided pneumothorax which was missed.



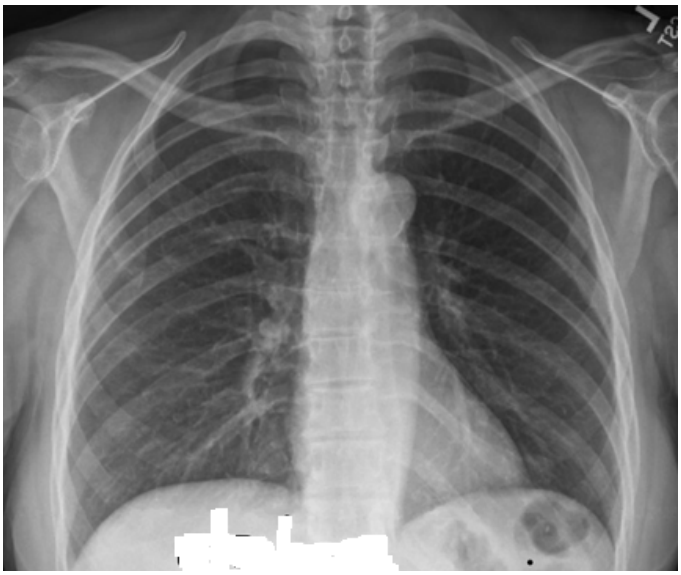
1/10/2022---Day 0

She was given pain medications and referred to see an orthopedic specialist. Seven days after the accident, she saw an orthopedist, who identified the pneumothorax on the initial chest radiograph and ordered repeat chest radiograph which was completed the following day at the outpatient imaging facility. The right-sided pneumothorax was measured at 3.8 cm from the apex on the chest radiograph and was unchanged from the initial chest radiograph.

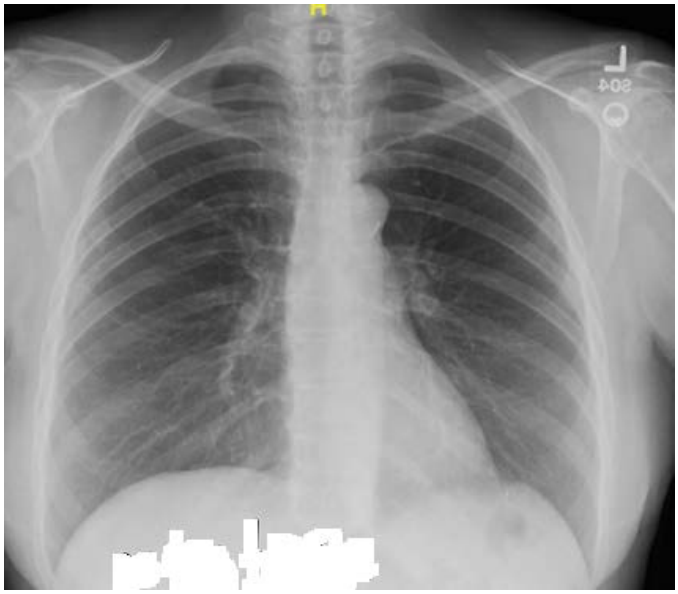


1/17/2022- day 7

Two days later, she saw her primary care physician. She denied cough or shortness of breath and the right-sided chest wall pain had improved. On examination, she was afebrile, with pulse rate of 71, her blood pressure 119/82, and respiratory rate of 16. Oxygen saturation was 98% on room air. Chest examination showed localized tenderness over her right lateral chest wall with decreased air entry in the right lung's apex and middle zones. She refused to go to the emergency room given concerns about a surge in COVID-19 cases. The pneumothorax was monitored with serial chest radiographs over the next 2 weeks and her home oxygen saturation remained above 96% on room air. Subsequent chest radiographs showed a reduction in the size of the pneumothorax which resolved one month after the initial accident.



1/21/2022—Day 11



1/31/21—day 21

Discussion

Pneumothorax is a common complication when there is a fracture of 2 or more ribs. One series, reported more than 81% of patients with rib fractures had pneumothorax or hemothorax.[1] Air can enter he pleural cavity because the jagged end of the displaced fractured rib injures the lung or the pleural cavity comes in direct contact with the atmospheric air. This disrupts the normal negative pressure in the pleural space, causing the lung to collapse partially or fully. The presentation of chest trauma-related pneumothoraces can range from occult pneumothoraces visible only on advanced imaging, to potentially lethal tension pneumothoraces. Radiographically, a large pneumothorax is defined when the distance between the lung margin and the chest wall is greater than 2 cm on an upright image. The management is guided by etiology, clinical presentation, and risk stratification. Current recommendations are to observe small pneumothoraces in stable asymptomatic patients.[2-5] The pneumothorax resolves by resorption at a rate of 1.25% per day[6] and the rate increases 4-fold by administering supplemental oxygen.[7-8] Most emergency room physicians and surgeons will place a chest tube for a large traumatic pneumothorax. This is consistent with Advanced Trauma Life support guidelines that recommend placing a thoracic tube for all traumatic pneumothoraces to avoid the possibility of developing a tension pneumothorax.[9] Our case supports the findings of the previous case reports that in carefully selected trauma patient, a large pneumothorax can be treated conservatively.[10-13] Our patient's large pneumothorax resolved spontaneously without administration of supplemental oxygen or placement of a thoracic tube. Although it was unfortunate that the pneumothorax was initially missed, it was eventually picked up by her orthopedic physician a week after the accident with complete spontaneous resolution without any ill effects. It is possible that if the pneumothorax was picked up initially, she would have been sent to the emergency room with likely chest tube placement with the same outcome. This raises the question of whether chest tubes should be placed in every patient with a large traumatic pneumothorax. It is not clear why an interventional approach has become a standard practice for traumatic pneumothoraces. It may be related to increasing ease of inserting a tube, better chest tube design, and physician perception that there is a need to actively evacuate the air. However, a conservative approach carefully selected patients can save patients from unnecessary procedures and related complications and can significantly decrease healthcare costs. Moore et al. published a prospective multicenter study to address the factor that might predict failure of conservative therapy on blunt trauma patients with pneumothorax.[14] They studied 569 blunt trauma patients recruited from 16 centers and concluded that progression of pneumothoraces on follow-up chest radiographs and respiratory distress are independent predictors of failure of conservative therapy and patients would benefit from tube placement. Our patient did not report dyspnea and the pneumothorax decreased in size on follow up imaging.

Conclusion

Caution must be taken in universally treating all large traumatic pneumothoraces with a chest tubes, as literature supports conservative management of selected clinically stable patients. This may reduce cost and morbidity associated with an invasive procedure.

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