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CASE REPORT

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Tension pneumothorax in a patient with granulomatosis

Mojtaba Ahmadinejad[1] | **Saman Afrasiabi**[2]

[1]Department of Surgery, Faculty of Medicine, Alborz University of Medical Sciences, Karaj, Iran

[2]Student Research Committee, Alborz University of Medical Sciences, Karaj, Iran

Correspondence
Saman Afrasiabi, Alborz University of Medical Sciences, Karaj, Iran.
Email: md.s.afrasiabi@gmail.com

Abstract

A woman with a clinical presentations of granulomatosis with polyangiitis (GPA) has been presented. Tension pneumothorax has been rarely reported; however, it is a life-threatening condition. Surgical intervention may be required in GPA patients who do not respond to chest tube insertion. Timely management can reduce the complication and mortality.

KEYWORDS

granulomatosis with polyangiitis, tension pneumothorax, thoracentesis

1 | INTRODUCTION

Wegener's granulomatosis (WG) is a necrotizing granulomatous vasculitis that has been recently known as granulomatosis with polyangiitis (GPA). Granulomatosis with polyangiitis is a rare autoimmune multisystem disease that is characterized by clinical presentations such as recurrent respiratory infections, upper and lower respiratory tract problems, or chronic, nonspecific constitutional complaints.[1] Pulmonary presentation of the disease also includes spherical nodule with cavitation, as a result of which pneumothorax can develop.[2,3] However, etiology of GPA is not very well known.[4] The diagnosis of the disease is made by abnormal kidney function tests, neutrophil predominance leukocytosis, elevated inflammatory markers, and rheumatoid factors.[5] The most common radiologic findings from chest radiography and computed tomography scanning are single or multiple diffuse nodules and cavitation, patchy and diffuse opacities.[6] Treatment of GPA includes pleural drainage (particularly in patients with respiratory problems), surgery corticosteroid, and immunosuppressants, depending on the nature of the disease and associated prognosis. In case of infection, antibiotics are prescribed. Aggressive treatment is recommended for better prognosis.[4]

In this article, tension pneumothorax is reported in a patient for the first time, which is a known case of GPA.

2 | CASE PRESENTATION

A 27-year-old woman was admitted to the emergency department with complaint of severe and acute onset of dyspnea, hemoptysis, productive coughs, and low systolic blood pressure. Patient had a 1-year-old history of hospitalization due to headache, bilateral frontal and maxillary tenderness, nasal congestion with pus, and bilateral otitis. Urgent chest X-ray was performed, and cavitation of large nodules was seen along with the tension pneumothorax in the left lung. Trachea shift to the contralateral side was also spotted (Figure 1). Following the diagnosis, a chest tube was inserted, and pneumothorax was relieved. No purulent secretions or blood discharge was seen. However, the patient complaint of dyspnea and radiography showed recurrence pneumothorax. The air leak continued for 8 days, because of which lung expansion surgery (wedge resection without pleurectomy) was performed, and all signs and symptoms of tension pneumothorax were relieved (Figure 2). The histopathology of the sample showed transmural inflammation of the vessel walls along multinucleated giant cells around necrotic region. Necrotic region appeared irregular and had nuclear debris. Given the history hemoptysis, a chest CT was obtained. Multiple large cavitation and ground-glass attenuations were observed (Figure 3). The patient was suspected of

sinusitis, and four different antibiotic therapy regimens were prescribed.

Due to increased frequency and severity of signs and symptoms and poor response to medical therapies, surgical intervention was suggested. Following endoscopic sinus surgery, the previous condition of the patient reappeared. Patient showed multiple treatment-resistant episodes of sinusitis accompanied by pain and swelling of knees and metacarpophalangeal (MCP) joints of both the hands for which rheumatological workup was provided. C-antineutrophilic cytoplasmic antibody test was positive with a titer of 1:100. The patient was also positive for antineutrophil cytoplasmic antibodies (ANCA), and her C-reactive protein (CRP) was 99 mg/L, erythrocyte sedimentation rate (ESR) was 44 mm/h, and white blood cell count was 15,700 cells per cubic millimeter of blood. Owing to the patient's history and signs and symptoms with the laboratory findings (abnormal CT findings, hemoptysis[7]), treatment for GPA was suggested. GPA was relieved following the treatment. Granulomatosis with polyangiitis, is this case, was diagnosed after pneumothorax.

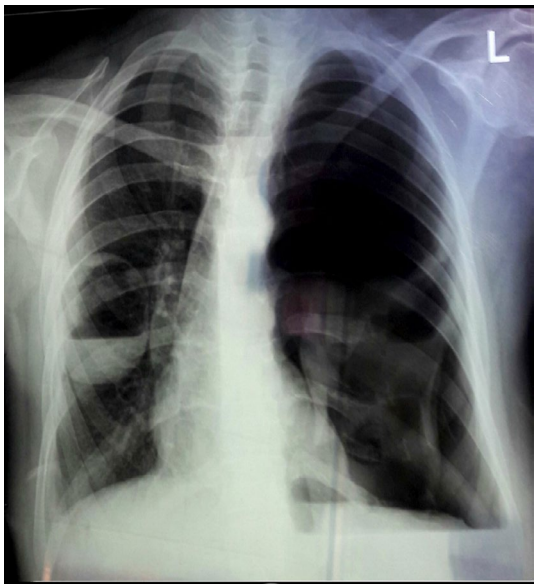

FIGURE 1 Chest X-ray imaging shows trachea shifted toward the opposing side

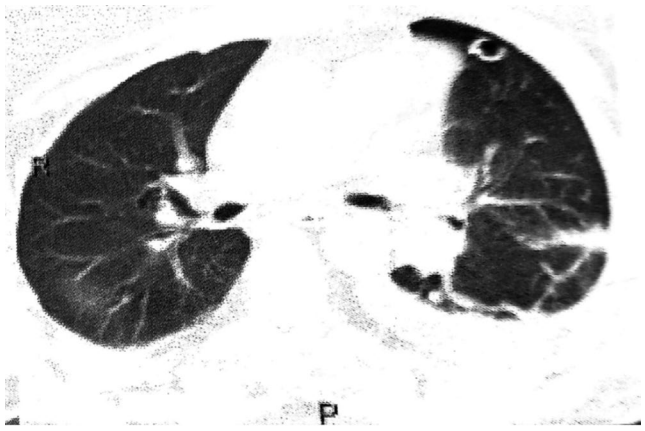

FIGURE 2 Chest X-ray imaging shows tension pneumothorax relieved

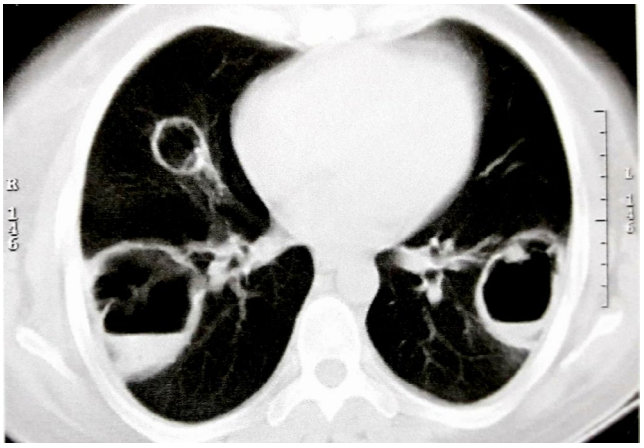

FIGURE 3 Chest computed tomography scans

3 | DISCUSSION

Presence of pneumothorax in patients with GPA is rare, and few cases have been reported in the literature. It can be a serious complication in patients under immunosuppressive drugs and antibiotics.[2] Pneumothorax can be identified from radiologic findings, without any symptoms. In some cases, aggressive treatment of GPA is required.[6,8] Tension pneumothorax is a life-threatening condition that has never been reported before in the context of GPA. Emergency insertion of chest tube or release of air using large needle is required in the cases of tension pneumothorax.[9] Our patient was an unknown case of GPA who had an unprecedented, life-threatening complication of tension pneumothorax. Since the patient did not respond to the chest tube insertion for the release of air, tension pneumothorax was treated by surgical intervention and pharmacological therapy (immunosuppression and concomitant glucocorticoid regimens) that improved the signs and symptoms of the disease.

4 | CONCLUSION

Pneumothorax is a known finding of GPA; nonetheless, tension pneumothorax is not expected in these patients. Granulomatosis with polyangiitis patients might be presented with tension pneumothorax that may or may not respond to needle or chest tube insertion, and surgical intervention can be required. However, timely management can reduce mortality.

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CONFLICT OF INTEREST

The authors deny any conflict of interest in any terms or by any means during the study.

AUTHORS' CONTRIBUTIONS

MA: has made substantial contributions to the conception; SA: has made substantial contributions to the conception, drafted the work, and substantively revised it.

ETHICAL APPROVAL

This study was approved by the Research Ethics Board of Alborz University of Medical Sciences.

CONSENT FOR PUBLICATION

Informed consent was obtained from each participant.

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All human research procedures followed were in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013.

DATA AVAILABILITY STATEMENT

All relevant data and materials are provided with in manuscript.

ORCID

Mojtaba Ahmadinejad https://orcid.org/0000-0001-9813-5912
Saman Afrasiabi https://orcid.org/0000-0002-9182-2311

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