Case Report

Bronchiolitis Obliterans Organizing Pneumonia in a Young Healthy Female Patient

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Abstract

One of the idiopathic respiratory tract inflammation is cryptogenic organizing pneumonia (COP). Most patients are symptomatic for <2 months and have a clinical presentation that resembles community-acquired pneumonia. The diagnosis of COP requires histopathologic identification of a predominant pattern of organizing pneumonia and the exclusion of any possible cause. In the patient described herein with interstitial pulmonary disease, the diagnosis of COP was achieved by fiberoptic bronchoscopy. The pathologic findings disclosed bronchioles, alveolar ducts, and alveoli infiltrated with mononuclear cells. The lumina were obliterated with fibroblasts and loose granulation tissue. Corticosteroid treatment resulted in significant improvement. In our patient, the only significant finding was profound Type I respiratory failure without significant raised inflammatory markers. Transbronchial biopsy was a key in making a diagnosis of our patient, as the patient was unwell to undergo video-assisted thoracoscopic surgery.

Keywords: Cryptogenic organizing pneumonia, fiberoptic bronchoscopy, transbronchial biopsy

INTRODUCTION

Cryptogenic organizing pneumonia (COP) is characterized with nonspecific flu-like symptoms, as well as cough and dyspnea with an absence of etiological agents. The area of injury is primarily the alveolar wall, however alveolar ducts, respiratory bronchioles, and distal bronchioles are also affected, and the pattern appears as a type of diffuse interstitial lung disease. COP is difficult to diagnose with nonspecific symptoms, however our findings in this case offer help in diagnosis.

COP is categorized as interstitial lung disease.^[1] The disease often presents as idiopathic, or with etiologies such as medication, infectious disease, malignancy, radiation and chemotherapy, and connective tissue disease.^[2-5]

CASE REPORT

A 30-year-old Saudi female patient presented to the emergency department complaining of nonproductive cough and pleuritic chest pain for 5 days. The cough was worse 1 day prior to presentation and was associated with shortness of breath but no fever. She had right lower pleuritic chest pain, which was

moderate in severity, with no radiating and relieving factors. She developed upper respiratory infection when exposed to camels during her travel to Hail by car. Her medical history was insignificant.

On examination, she looked ill and in distress, with continuous coughing. Blood pressure was 140/84 mmHg, pulse was 119 beats/min, temperature was 97.7°F (36.5°C), respiratory rate was 25 breaths/min, and oxygen saturation was 80% on room air. The trachea was central. Both lower zones were dull to percussion. On auscultation, bilateral decreased air entry with crackles was heard. She was tachycardic but had a regular rhythm. The remainder of her examination was normal.

Her laboratory investigations showed a hemoglobin concentration of 13 g/dL, white cell count of 7270 cells/mm³, platelets of 340 × 10³ cells/mm³, blood urea nitrogen of

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2.4 mmol/L, creatinine of 66 μ mol/L, serum potassium of 3.3 mmol/L, and sodium of 136 mmol/L. Her electrocardiogram showed sinus rhythm, lactic acid of 0.60 mmol/L, procalcitonin of 0.08 ng/mL, and c-reactive protein of 12 mg/L. Her arterial blood gas analysis showed pH 7.45, PCO₂ 43 mmHg, HCO₃⁻ 29 mmol/L, PaO₂ 52 mmHg, and SpO₂ 83% on room air. Chest X-ray and computed tomography (CT) scan of the thorax are shown in Figures 1 and 2.

The clinical course of the patient was as follows:

Hospital day 1

The patient was admitted to the intensive care unit as community-acquired pneumonia to rule out H1N1 and MERS-COV. She was started on ceftriaxone + tamiflu and provided with continuous positive airway pressure (CPAP).

Hospital day 2

A Cardiologist was consulted, and echocardiogram obtained was normal with no signs of pulmonary hypertension. Chest

X-ray became worse in spite of CPAP. The patient was still hypoxic and did not show any sign of improvement.

Hospital day 3

The patient continued to be symptomatic and hypoxic despite CPAP, high-flow O₂, and intravenous antibiotics and hence was intubated and ventilated, requiring high inspired concentrations of oxygen.

The patient's chest X-ray showed bilateral chest infiltrates. The patient was not responding to antibiotic and developed acute respiratory distress syndrome. She was started on empirical pulses of intravenous steroids. Fiberoptic bronchoscopy was done including broncho-alveolar washing and transbronchial biopsy. Samples were sent for microbiology including acid-fast bacilli screen, culture and sensitivity, Gram stain, virology, fungi, and histopathology [Figures 3-7]. After bronchoscopy,

Figure 1: Chest X-ray showing bilateral diffuse ground-glass opacities and peripheral consolidation

Figure 2: Computed tomography thorax showing bilateral scattered, mainly peripheral ground-glass opacities and consolidations involving both lung lobes, associated with diffuse centrilobular nodules

Figure 3: Histopathology showing alveolar thick wall plus inflammatory cells

Figure 4: Histopathology showing fibrosis

the patient developed pneumothorax; a chest tube was inserted and removed after the resolution of pneumothorax.

Day 4

The patient improved and her oxygen requirements were lower. Her trachea was extubated. Biopsy confirmed features of COP.

Two days later, there was a significant improvement. She was discharged from the hospital on oral weaning dose of steroids and bone protection therapy with monthly pulmonary clinic follow-up. After 4 weeks' visit, repeat lung function showed a forced expiratory volume in the first second (FEV_1 – 1.8 L) and forced vital capacity (FVC – 2.2 L) and a FEV_1 /FVC ratio of 80%, suggesting significant restrictive ventilatory defect. All cultures including autoimmune screen were negative.

After 6 months, the patient was completely asymptomatic with normal pulmonary function tests which showed normal transfer factor. A 6-min walk test did not reveal oxygen desaturation. Her chest X-ray showed a complete resolution of the previously

observed bilateral patchy infiltrates [Figures 8 and 9], and she was gradually weaned off the steroids.

DISCUSSION

COP, formerly called bronchiolitis obliterans organizing pneumonia, often presents with obstruction of bronchioles, alveoli, and plugging with connective tissue.^[6] COP often presents as obstruction of bronchioles, alveoli with scarring, and inflammation.^[7] Individuals aged 40–60 years are affected the most.^[8] Other specific disorders such as blood cancers, inflammatory bowel disease, and connective tissue disorder may accompany COP.^[9] The diagnosis of COP can be confirmed on CT scan and lung biopsy.^[10] The clinical and radiological improvement with a high dose of steroid was encouraging.

This patient remained afebrile with inflammatory markers not elevated in spite of the bilateral chest X-ray showing patchy infiltrates. Although the diagnostic modality of choice is video-assisted thoracoscopic surgery, it was not feasible in this case as she was critically ill, was hemodynamically

Figure 5: Histopathology showing mixed inflammatory cell necrosis and fibrosis

Figure 6: Periodic acid–Schiff stain

Figure 7: Retic stain showing changes in lung sections following lung biopsy. Loose plugs of granulation tissue showing patchy filling of the lung alveoli and respiratory bronchioles

Figure 8: Improved bilateral chest infiltrates

Figure 9: Chest x-ray showing resolution of the previously observed bilateral patchy infiltrates

compromised, and was in respiratory distress. Transbronchial biopsy was diagnostic.

CONCLUSION

Not all consolidations are pneumonia. Effective management of a patient demands systemic physical examination and correlation of physical examination, radiological features, and laboratory data. Good supportive management, investigations appropriate to the patient's clinical condition, high index of suspicion, good diagnostic skill, and timely treatment helped this patient overcome the disease.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that her name and initial will not be published, and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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