Case Report

Severe fibrosing mediastinitis with atypical presentation: Effective control with novel therapeutic approach

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Abstract

Fibrosing mediastinitis (FM), also known as sclerosing mediastinitis, is an uncommon but serious disease involving the mediastinal structures. A high index of suspicion is essential to establish the diagnosis of FM and starting the appropriate therapy for patients. Here, we report a case of a young female who presented with chest symptoms and subsequently underwent different laboratory and radiologic investigations and an excisional biopsy. The findings of these investigations were consistent with the diagnosis of idiopathic FM. Her disease was associated with complete occlusion of three pulmonary veins and the left main pulmonary artery. The patient was treated with initial high-dose steroids followed by maintenance steroid and methotrexate therapy with very good long-term disease control. Clinical response, high-sensitivity C-reactive protein, and erythrocyte sedimentation rate were used to monitor disease activity and response to therapy.

Keywords:

Fibrosing, mediastinitis, pulmonary, therapy

Fibrosing mediastinitis (FM) is a rare condition characterized by mediastinal fibrotic reaction.[1,2] Diagnosis of FM is based on clinical symptoms, imaging, and histopathological analysis.[3-5] Involvement of pulmonary vasculature secondary to FM is rare.[5,6] Treatment of FM is largely empirical and includes pharmacotherapy and percutaneous surgical intervention.[4-6] Here, we report a case of a young woman with severe idiopathic FM who was successfully treated with pulsed steroid therapy followed by maintenance oral steroids and methotrexate with very good long-term disease control. To our knowledge, this is the first reported case of FM treated successfully with pulsed steroid therapy and methotrexate.

Case Report

A 24-year-old female presented with an 8-week history of palpitation and progressive shortness of breath associated with two short-lived episodes of syncope. She did not report orthopnea, paroxysmal nocturnal dyspnea, or chest pain. The rest of her history was unremarkable.

Physical examination showed normal findings, apart from decreased air entry in the lower lung fields and mild desaturation (oxygen saturation, 92%–94%). Extensive laboratory investigations revealed only mildly decreased hemoglobin of 10 g/dL, with microcytic, hypochromic features, elevated high-sensitivity-C-reactive protein (hs-CRP), erythrocyte sedimentation rate (ESR) and mildly elevated antinuclear factor (antinuclear antibody).

Her electrocardiogram showed sinus rhythm with occasional paroxysmal atrial fibrillation. Her chest X-ray showed enlarged heart with prominent interstitial and vascular markings [Figure 1]. Echocardiography showed normal left ventricular systolic function, left atrial mass,

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severe right ventricular (RV) dysfunction, pulmonary hypertension with estimated pulmonary arterial pressure of 118 mmHg, and mild pericardial effusion with focal 1–2 cm thickening [Figure 2]. Spirometry was suggestive of restrictive lung physiology.

Chest computed tomography (CT) showed diffuse thickening of the entire mediastinum of up to 2.5 cm, mild pulmonary fibrosis, and complete occlusion of the left main pulmonary artery, the two left and the right lower pulmonary veins [Figures 3 and 4]. Magnetic resonance imaging showed similar pulmonary vascular findings [Figure 5]. Fine-needle pericardial aspiration was diagnostically inconclusive.

Due to the presence of left atrial mass and a lack of definitive diagnosis, a decision was made to surgically excise the left atrial mass and obtain mediastinal tissues for histopathological studies. Due to intense mediastinal inflammation, only excisional biopsy from mediastinal tissues and from the pericardial mass was performed. The histopathology results of these biopsies revealed lymphohistiocytic inflammation consistent with noncaseating granulomatous inflammation, and there was no evidence of acid-fast bacilli and any fungal elements. An immunohistochemistry study showed negative CD-20 (B-cell marker) and CD-3 (T-cell marker).

The patient was initially started on anti-tuberculosis therapy, but therapy was discontinued because of lack of response and deterioration of the patient's symptoms. At this stage, the patient's shortness of breath progressed to Class IV, and she became oxygen dependent. In the light of the clinical picture and histological findings, a diagnosis of idiopathic FM was made. Pulsed steroid therapy was started, with intravenous methyl

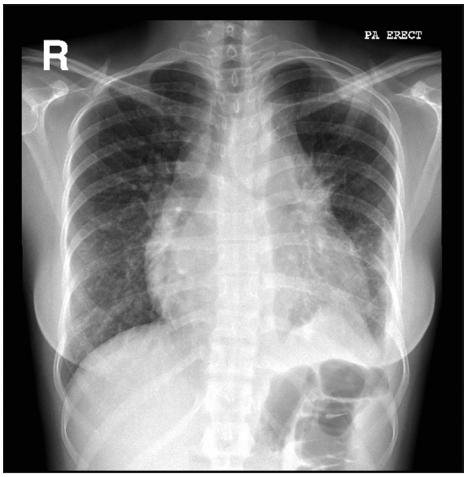

Figure 1: Chest X-ray of the patient at presentation showing cardiomegaly and prominent pulmonary interstitial markings

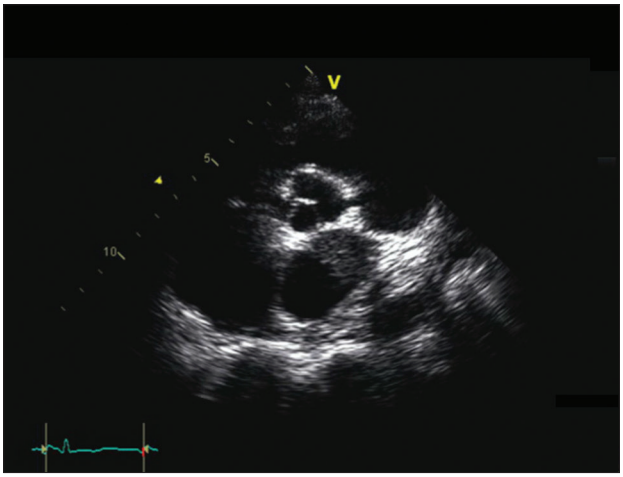

Figure 2: Two-dimensional transthoracic echocardiography from long-axis view showing the left atrial mass

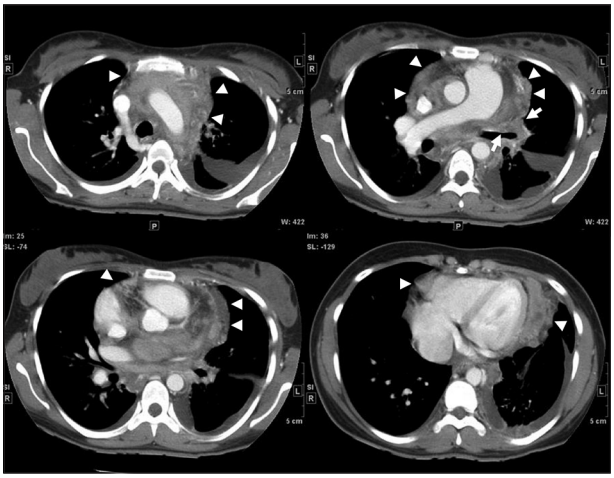

Figure 3: Computed tomography angiography of pulmonary artery. Complete obliteration of the left pulmonary artery (arrows) and thickening of the entire mediastinum and part of the pericardium (arrowheads). A picture of bilateral pulmonary fibrosis is observed as well

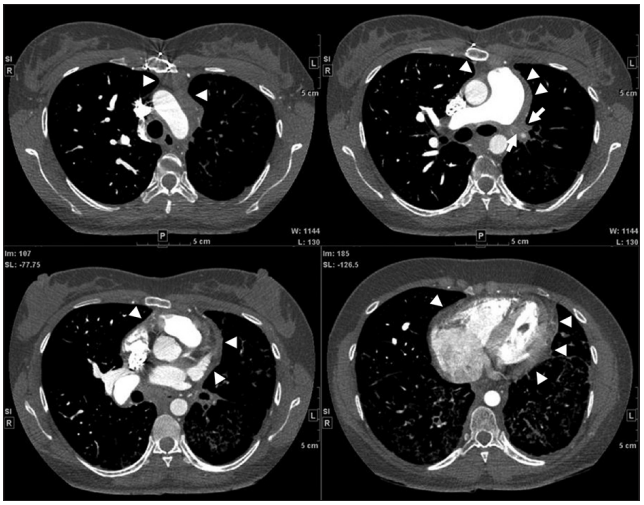

Figure 4: Another computed tomography angiography showing the complete obliteration of the left pulmonary artery (arrows) and thickening of the entire mediastinum and part of the pericardium (arrowheads)

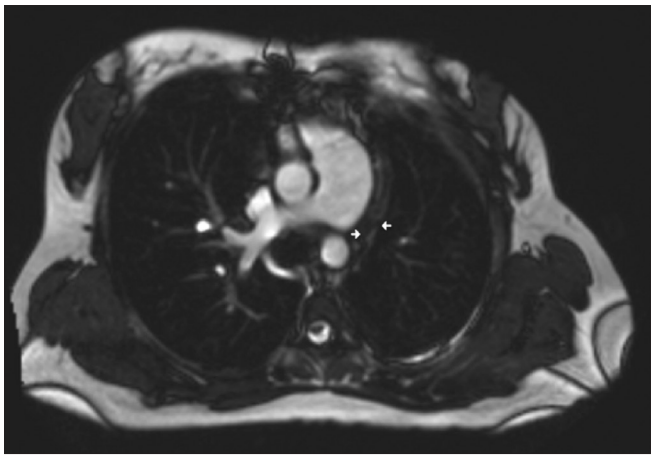

Figure 5: Magnetic resonance angiography of pulmonary vessels showing similar complete obstruction of the left pulmonary artery seen on computed tomography chest (arrows)

prednisolone of 1 g/day for 3 days and then 60 mg/day orally thereafter. The patient responded rapidly to steroid therapy. Her shortness of breath improved and started to ambulate. In addition, her oxygen requirement decreased dramatically. The patient was subsequently discharged on prednisolone and warfarin. Her ESR and hs-CRP decreased markedly over the next few weeks.

On follow-up as outpatient, methotrexate was introduced, and her prednisolone dose was slowly reduced over the next few weeks while her ESR and hs-CRP were monitored. Over the ensuing months, she was maintained on a small daily dose of 5 mg of prednisolone and 10 mg of methotrexate weekly. However, the obstructive pathology of her pulmonary vasculature did not change. Surgical repair was sought abroad but she was deemed inoperable. The patient went back to school and completed her university studies and remained symptom free. A follow-up echocardiography showed normalization of RV function and a drop of her pulmonary pressure to normal levels. After 1 year, her immunosuppressive therapy was discontinued and her disease remained inactive until her recent follow-up 7 years from the time of her initial presentation.

Discussion

Idiopathic FM is characterized by excessive mediastinal fibrosis that can be localized or diffuse. Many hypotheses have been proposed for its etiology, including immune reaction, chronic infection, familial disorder, and malignancy.[1-5] Nonetheless, in the majority of cases, the exact cause remains unknown. In our case, a diagnosis of idiopathic FM was made after an extensive workup, including excisional biopsy.

Cough, chest pain, and shortness of breath are common symptoms among FM patients. CT with contrast is known to be the most useful diagnostic modality for FM.[7] Involvement of the mediastinal vasculature is common in idiopathic FM, and the superior vena cava (SVC) is the most commonly involved vessel,[2,8] but involvement of the pulmonary vasculatures is rare.

Stenting or surgical repair might be considered to palliate symptoms by relieving airway or vascular obstruction. Stenting of obstructed SVC has been reported with variable success.[9] One of the complications of stenting of the pulmonary arteries with near obliteration is postoperative reperfusion injury as shown in a previous case report.[6] In our case, with total obstruction of the left pulmonary artery and three pulmonary veins, stenting and surgical repair were not feasible.

Other reported treatment modalities include glucocorticoid, with good symptom improvement.[9,10] Nevertheless, in these reported cases, steroid therapy was initiated as low-dose monotherapy and had a short follow-up. In our case, we used high-dose pulse methylprednisolone therapy, followed by high-dose oral prednisolone and methotrexate therapy. We have also used inflammatory markers such as hs-CRP and ESR to guide therapy and monitor disease activity. Interestingly, our patient normalized her pulmonary artery pressure and RV size and function in the face of completely occluded left pulmonary artery and three pulmonary veins. The exact explanation is unclear, probably due to the development of collateral circulation leading to reduction in her pulmonary vascular resistance.

Conclusion

This case highlights a dramatic presentation of idiopathic FM associated with extensive pulmonary vascular obstruction that was successfully controlled with a combination of glucocorticoids and methotrexate guided by monitoring hs-CRP and ESR.

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Conflicts of interest
There are no conflicts of interest.

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