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Case report

Pulmonary arterial hypertension in childhood: an unsual presentation with fibrosing mediastinitis

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Abstract. Acquired stenosis of normally connected pulmonary veins is a rare condition in children, usually associated with mediastinal processes. It may present later with a less specific clinical picture, symptoms and signs mimicking chronic lung disease. Fibrosing mediastinitis is a rarer disorder of unknown etiology, although several suspected causes such as granulomatous diseases, characterized by fibrous tissue proliferation within the mediastinum, leading to respiratory and cardiac failure by bronchial obstruction or pulmonary hypertension. (www.actabiomedica.it)

Key words: Pulmonary veins, heart failure, respiratory failure

Introduction

Fibrosing mediastinitis is a rare condition caused by the proliferation of acellular collagen and fibrous tissue within the mediastinum (1, 2). Although an unknown etiology, the most common suspected causes are generally granulomatosis diseases (especially histoplasmosis, tuberculosis and sarcoidosis), and radiotherapy. An idiopathic form of fibrosing mediastinitis has also been described, probably autoimmune and in some cases associated with fibrosing processes in other sites, such as retroperitoneal fibrosis, orbital pseudotumor, and fibrous thyroiditis (3, 4, 5). Typically, it presents with signs and symptoms of obstruction of vital mediastinum structures such as central systemic veins, airways and pulmonary arteries and veins (2, 6). We report of an adolescent with pulmonary hypertension and fibrosing mediastinitis.

A 17-year-old caucasian boy presented at our emergency ward with severe dyspnea, nonproductive cough and hypoxemia. The main features of physical examination were: cushingoid facies, crackles in the lower lung zones and a 3/VI systolic murmur at the lower left sternal border. ECG showed right ventricular hypertrophy. Chest x-ray demonstrated bilateral interstitial opacities, and mild cardiac enlargement (Fig 1). Transthoracic echocardiography showed enlarged and hypertrophic right ventricle (RV) with severely depressed function, RV systolic pressure of 70 mmHg, and continuous turbulent flow at the entrance of left superior pulmonary vein into left atrium. Pulmonary function tests revealed a restrictive pattern. All laboratory tests were unremarkable.

History revealed, at the age of 14 years old, in another institution, a previous diagnosis of mediastinal mass on a chest x-ray performed to investigate progressive shortness of breath, recurrent upper respiratory track infections and frequent episodes of hemoptysis, and since then an ongoing treatment with prednisone.

Chest computed tomography (CT) showed a mediastinal mass with homogeneous internal density, without calcification or nodular lesions, areas of smooth

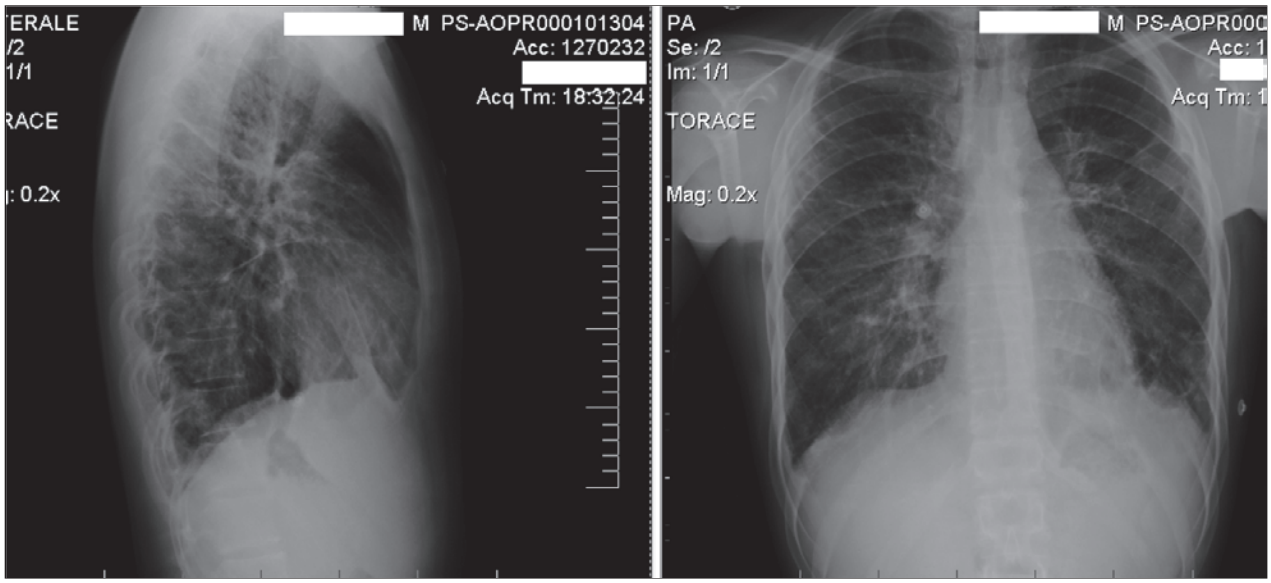

Figure 1. Posteroanterior and lateral chest-X-ray: bilateral interstitial opacities, dilatation of the azygos vein and mild cardiac enlargement.

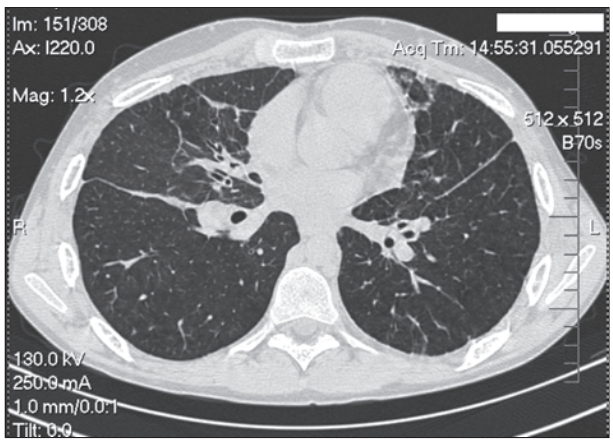

Figure 2. HRCT slice through the lower lung zone demonstrates diffuse bronchial wall thickening and marked dilatation of intrapulmonary branches of pulmonary veins. Smooth thickening of the interlobular septa is seen in some areas associated with areas of ground-glass opacity

thickening of the interlobular septa (Fig. 2), and complete obstruction of the superior vena cava (SVC). A perfusion scan showed the near total absence of perfusion to the left lung (only minimal perfusion to the left apex), and defects in the right upper lobe (Fig. 3).

Cardiac catheterization confirmed complete obstruction of SVC, severe pulmonary artery hypertension (mean pressure of 52 mmHg), and showed high capillary wedge pressure (38 mmHg on the left, 25 mmHg on the right). We also found left pulmonary artery stenosis, with progressive thinning and poor peripheral arborization (Fig. 4A), left superior pulmonary vein stenosis complete left inferior pulmonary vein obliteration (Fig. 4B), and mild to moderate right pulmonary veins stenosis (Fig 5).

The patient underwent mass biopsy, which appeared composed of dense reactive fibrous tissue with infiltrations of various inflammatory cells, without granulomatous or neoplastic lesions, leading to the diagnosis of idiopathic fibrosing mediastinitis. The patient, now in New York Heart Association functional class III, is under treatement with cardiac glycosides and diuretics.

Acquired stenosis of normally connected pulmonary veins is rare in childhood, and has been associated with mediastinal processes such as neoplasms, fibrosing mediastinitis or radiotherapy. Idiopathic fibrosing mediastinitis is a more rarer disorder, marked by diffuse and progressive proliferation within the mediastinum of fibrous tissue, leading to respiratory and cardiac failure by bronchial obstruction or pulmonary hypertension (6, 7, 8). SVC compression is most commonly reported, pulmonary vein occlusion is the most insidious manifestation (6, 8).

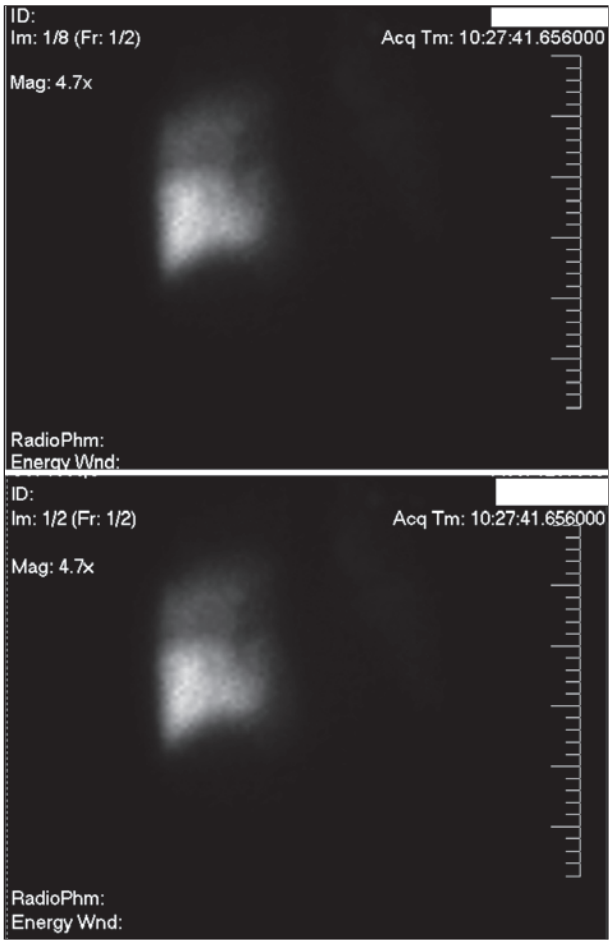

Figure 3. Perfusion scan: posterior view of left and right lung

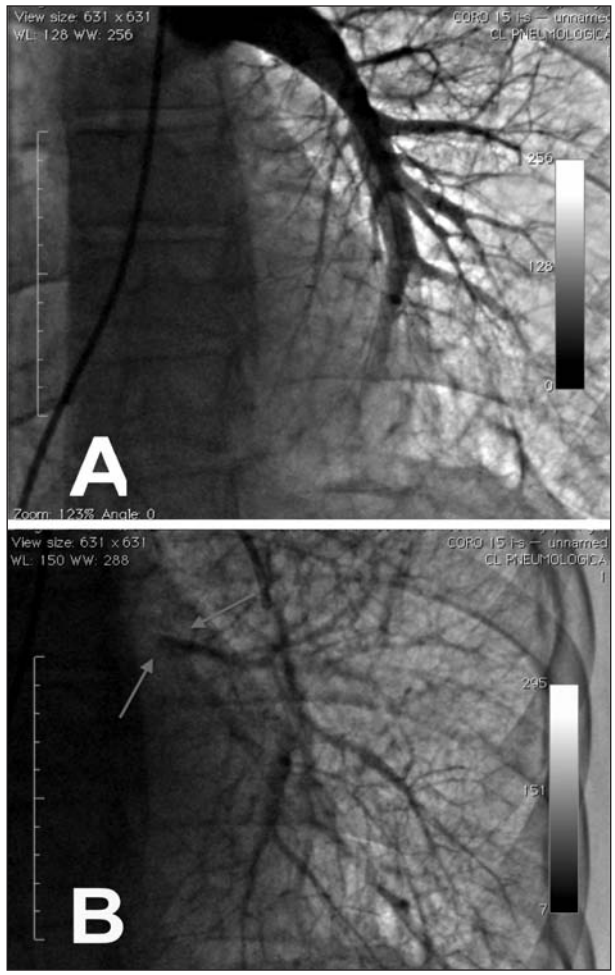

Figure 4. A) Left pulmonary artery angiography: left pulmonary artery stenosis with progressive thinning and poor peripheral arborization. B) Left pulmonary artery angiography, pulmonary venous phase: a very thin superior pulmonary vein (arrows), but no inferior vein (complete obliteration).

The process of compression, not well understood, probably involves the replacement of normal tissues with inflammation and fibrosis. Effective treatments for this life – threatening condition are lacking. Immunosuppression has been suggested, but usually is not effective (6). Surgical management has been reported to be effective in some cases, when relief of the obstruction is feasible (9, 10). Interventional cardiac catheterization, using intravascular stents, has been attempted, but further studies are needed (11, 12). In our case the doubt of IgG4 - related disease (IgG4 – RD) has been raised; the diagnosis of IgG4-RD requires characteristic findings upon biopsy of affected tissue, findings including lymphoplasmacytic tissue infiltration of mainly IgG4-positive plasma cells and small lymphocytes, accompanied by fibrosis that has storiform features and often by obliterative phlebitis. The optimal treatment for IgG4-related disease (IgG4-RD) has not been established. Most patients respond to glucocorticoids and the non - responders undergo treatment with azathioprine, mycophenolate and at least rituximab. Search of IgG4 positive plasma cells was not performed on the biopsy. The patient was investigated for fibrosing processes in other sites without significant findings, however, on arrival to our attention, he was already on treatment with glucocorticoids. The diffuse disease and severe vascular involvement precluded surgery. Intravascular stents were not considered because of the severe involvement of left pulmonary veins.

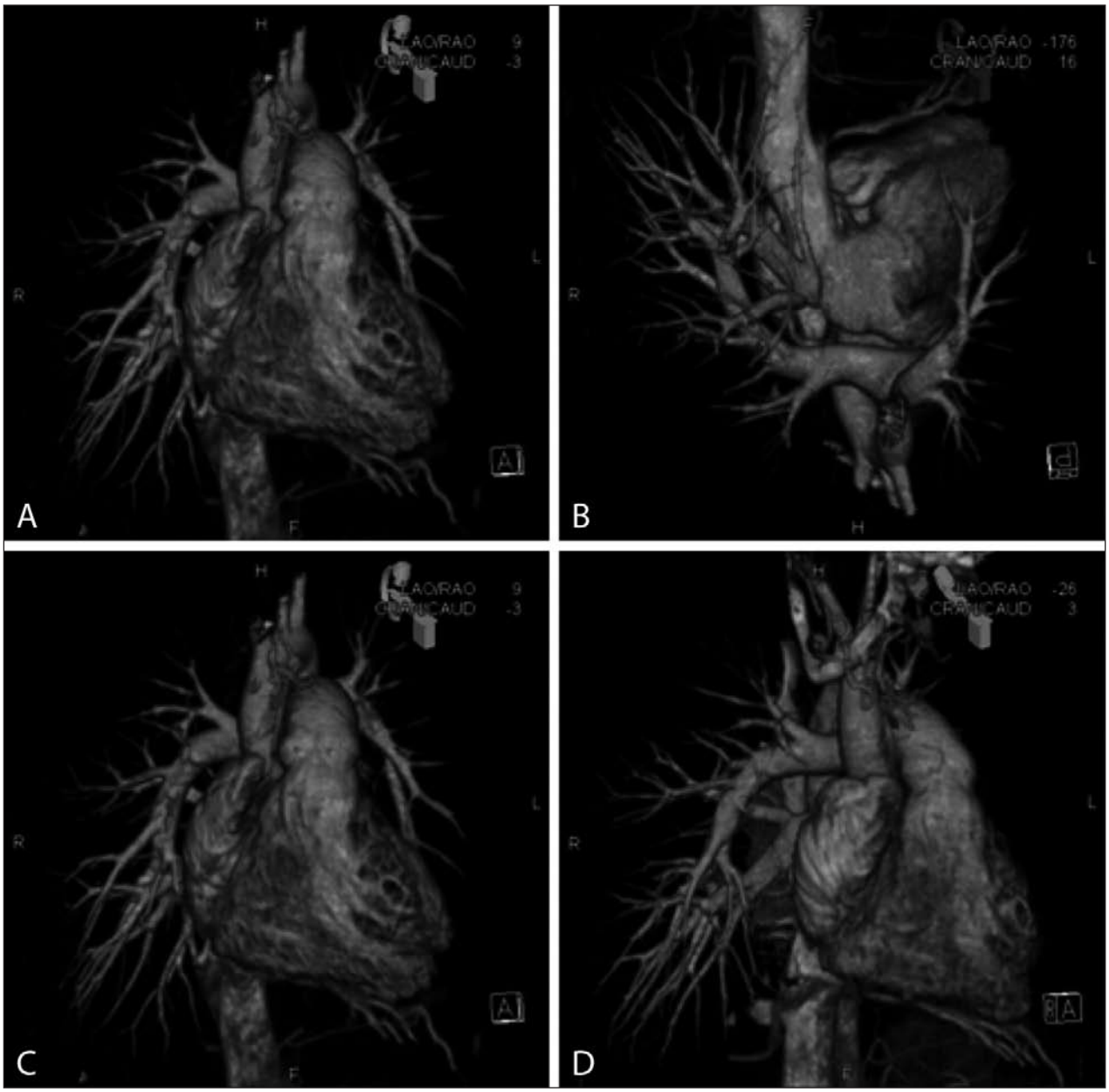

Figure 4. High-contrast 3D visualization of heart and pulmonary vessel tree with syngo InSpace 3D.

Pulmonary vein stenosis generally has poor prognosis, particularly if all veins are affected. View the dismal natural history of untreated pulmonary vein stenosis, prompt diagnosis and appropriate therapeutic measures are mandatory.

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