CASE REPORT

Idiopathic pleuroparenchymal fibroelastosis (PPFE) – A case study of a rare entity

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KEYWORDS
Idiopathic pleuroparenchymal fibroelastosis; Pirfenidone; Rare lung disease

Abstract  Idiopathic pleuroparenchymal fibroelastosis (IPPFE) was recognized as a rare new entity. We report the case of a 63 years old female suffering from progressive dyspnea and dry cough for three years. Two years before admission to our hospital, idiopathic pulmonary fibrosis (IPF) was diagnosed in another hospital and treatment with prednisolone and N-acetylcysteine (NAC) was commenced. At admission HRCT showed upper lobe dominant fibrosis and associated pleural thickening. Surgical biopsies were re-evaluated and revealed fibroelastosis with pleural thickening and a probable UIP pattern, consistent with idiopathic PPFE. Treatment with pirfenidone was initiated due to progression under prednisolone and NAC. Upper lobe predominant pleural thickening with associated subpleural fibrotic changes should raise suspicion of PPFE.

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Introduction

Pleuroparenchymal fibroelastosis (PPFE) is a rare entity, characterized by upper lobe dominant subpleural fibroelastosis and dense fibrous thickening of the visceral pleura. Most cases are idiopathic. Evidence based treatment options do not exist. In the update of the international consensus classification of idiopathic interstitial pneumonia (IIP), idiopathic PPFE has been included within the group of rare IIP. We here report a case of PPFE, which was initially misdiagnosed as IPF.

Case presentation

A 63 year old female patient presented with progressive dyspnea and dry cough for 3 years. There was no significant occupational exposure, allergy or smoking history. There was no family history of pulmonary fibrosis.

Two years before the admission to our hospital high-resolution computed tomography (HRCT) in a regional hospital had shown fibrotic changes of the lung parenchyma. Subsequently the patient underwent a video assisted thoracoscopic surgery (VATS) for histological assessment,

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Idiopathic pleuroparenchymal fibroelastosis (PPFE) - a rare entity

Figure 1  (A) Pleural thickening, dense fibrosis and consolidation in the upper lobes. (B) Traction bronchiectasis, reticular opacities and minor honeycombing in the lower lobes.

Table 1  Pulmonary function tests in follow up.

<table>
<thead>
<tr>
<th></th>
<th>2 years before admission</th>
<th>At admission</th>
<th>6 months follow up under pirfenidone</th>
<th>1 year follow up under pirfenidone</th>
</tr>
</thead>
<tbody>
<tr>
<td>FVC [% pred.]</td>
<td>72</td>
<td>55</td>
<td>51</td>
<td>37</td>
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<td>FEV1 [% pred.]</td>
<td>80</td>
<td>57</td>
<td>39</td>
<td>n.a. a</td>
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<tr>
<td>TLCO [% pred.]</td>
<td>46</td>
<td>35</td>
<td>25</td>
<td>n.a. a</td>
</tr>
<tr>
<td>paO2 [mmHg]</td>
<td>82</td>
<td>67</td>
<td>68</td>
<td>65</td>
</tr>
</tbody>
</table>

a  n.a. = not available.

Figure 2  (A) The biopsy from the upper lobe showed severe fibrosis in the subpleural space with a prominent elastosis in the EvG stain; the adjacent pulmonary parenchyma revealed non-characteristic alveolar-septal fibrosis without honeycombing. (B) The biopsy from the lingular lobe revealed a patchy fibrosis with paraseptal and subpleural predominance. Honeycombing and mucus plugging were seen focally. Fibroblastic foci were not detected. Inflammatory infiltrates were scarcely developed. In some parts proliferation of smooth muscle cells was found. A mesh-like fibrosis was seen focally.

Fibrotic changes were interpreted as normal interstitial pneumonia (UIP) pattern. A diagnosis of IPF was made and a treatment with prednisolone and NAC started.

HRCT performed in our hospital demonstrated upper lobe predominant pleural thickening and associated reticular opacities, traction bronchiectasis, subpleural and peribronchial consolidation. There was upper lobe shrinkage and architectural distortion (Fig. 1A). The lower lobes showed minor honeycombing (Fig. 1B). Bronchoalveolar lavage cell differential was normal. There was no clinical or serological evidence of a connective tissue disease, vasculitis or extrinsic allergic alveolitis. Lung function showed a significant decrease in forced vital capacity (FVC) (55% of predicted) in comparison to two years earlier (72% of predicted) (Table 1). Six-minute walking test demonstrated a walking distance of 475 m with significant desaturations (76%). Transthoracic echocardiography showed mild pulmonary hypertension with an estimated systolic pulmonary artery pressure of 35 mmHg.
Because of the atypical location of the fibrotic changes predominantly in the upper lobes and the marked pleural thickening, histological specimens were reassessed in our pathology department. Histologic re-examination revealed the characteristic findings of PPFE with significant subpleural elastosis and alveolar-septal fibrosis in the left upper lobe (Fig. 2A) and a probable UIP pattern without fibroblastic foci in the lingula (Fig. 2B).

Due to the marked lung function decline and the progression of dyspnea over 3 years, we started treatment with pirfenidone. Long term oxygen treatment was also started because of significant desaturation on exertion. After 6 and 12 months of treatment with pirfenidone FVC and diffusing capacity of the lung for carbon monoxide (DLCO) further declined and the treatment was stopped. The patient was referred for evaluation for lung transplantation, however due to the comorbidity of severe osteoporosis and advanced age, lung transplantation was denied. The patient died 9 months later from progressive respiratory insufficiency.

In our patient, the treatment with pirfenidone with standard daily dosage (2403 mg/day) was initially well tolerated; however there was no improvement in dry cough and dyspnea. The treatment was stopped after one year due to significant decline in lung function (more than 10% of FVC) and 8 kg of weight loss. There are only sporadic reports on PPFE treatment, including antifibrotic drugs. The collection of further evidence for diagnostic criteria and treatment of such a rare disease is challenging but necessary.

In conclusion, our case of idiopathic PPFE with coexisting UIP pattern was first misdiagnosed as IPF. It is important to consider PPFE as a differential diagnosis in every patient with ILD and upper lobe dominant pleural thickening with adjacent subpleural fibrosis. This case confirms the value of the multi-disciplinary discussion as a reliable diagnostic tool for differential diagnosis of ILD subtypes.

Ethical disclosures

Protection of human and animal subjects. The authors declare that no experiments were performed on humans or animals for this study.

Confidentiality of data. The authors declare that they have followed the protocols of their work center on the publication of patient data.

Right to privacy and informed consent. The authors declare that no patient data appear in this article.

Conflicts of interest

The authors have no conflicts of interest to declare.

References