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Elżbieta Radzikowska, Urszula Nowicka, Elżbieta Wiatr, Lila Jakubowska, Renata Langfort, Mariusz Chabowski, Kazimierz Roszkowski

National Tuberculosis and Lung Diseases Research Institute, Warsaw, Poland

Organising pneumonia and lung cancer — case report and review of the literature

Organizujące się zapalenie płuca u chorego na raka płuca — opis przypadku i przegląd piśmiennictwa

Streszczenie

Organizujące się zapalenie płuc jest chorobą wynikającą z reakcji płuc na szereg czynników uszkadzających, zarówno pochodzenia egzo-, jak i endogennego. Notowane są również przypadki o nieustalonej etiologii. Ogniska organizującego się zapalenia płuc mogą stosunkowo często towarzyszyć naciekom nowotworowym w płucach, w tym szczególnie rakowi płuca. Organizujące się zapalenie płuc u chorych na raka płuca może być indukowane również przez chemio- lub radioterapię.

Autorzy pracy przedstawiają przypadek 65-letniego chorego przyjętego do Kliniki z powodu gorączki, suchego kaszlu, duszności wysiłkowej i stwierdzanych w obrazie radiologicznym klatki piersiowej zacienień w dolnym polu płuca prawego. W badaniu tomokomputerowym uwidoczniono naciek zapalny z powietrznym bronchogramem łączący się z wnęką. Bronchoskopowo stwierdzono obturację oskrzela segmentu 9. płuca prawego przez kalafiorowaty guz. W wycinkach stwierdzono utkanie raka płaskonabłonkowego płuca. Z wydzieliny oskrzelowej nie wyhodowano flory patogennej, nie wykryto również w surowicy przeciwciał w kierunku patogenów atypowych (*Mycoplasma pneumoniae*, *Chalamydia pneumoniae*, *Legionella pneumophila*). Chorego leczono operacyjnie, dokonując resekcji płata dolnego płuca prawego. W badaniu histologicznym specimenu pooperacyjnego wykryto w oskrzelu niewielkie ognisko nowotworu płuca oraz rozległe nacieki organizującego się zapalenia płuc. W opinii autorów pracy leczenie operacyjne było wystarczające zarówno w stosunku do raka płuca, jak i indukowanego nowotworem organizującego się zapalenia płuc. W 6 miesięcy po zabiegu stan chorego był bardzo dobry i nie stwierdzono wznowy opisywanych procesów chorobowych.

Reasumując, autorzy przedstawiają przypadek chorego na raka płaskonabłonkowego płuca (T1N0M0) z towarzyszącym rozległym naciekiem organizującego się zapalenia płuc.

Słowa kluczowe: organizujące się zapalenie płuc, rak płuca

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Abstract

Organising pneumonia (OP) is a distinct clinicopathological entity resulting from pulmonary reaction to noxious environmental or endogenous factors, but also idiopathic cases have been noted. Frequently, small foci of OP accompany lung cancer infiltrations. Also OP is sometimes a reaction to radio- or chemotherapy, but it is rarely a predominant lesion in the course of lung cancer.

We present the case of 65-year-old patient who presented with fever, dry cough, exertional dyspnoea and pneumonic consolidation in the right lower lobe. Bronchoscopy revealed squamous carcinoma obstructing the right lower bronchi. He was surgically treated, and the right lower lobe was resected. Pathological examination of a specimen revealed only small infiltration of carcinoma cells in the wall of the bronchi and large confluent areas of organising pneumonia. Surgery was a sufficient treatment for both diseases. Six months later he was in good condition without any pulmonary infiltrations.

To sum up, a case of endobronchial squamous cell carcinoma in stage T1N0M0 with predominant clinical and radiological signs of OP is presented.

Key words: organising pneumonia, lung cancer

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Adres do korespondencji: National Tuberculosis and Lung Diseases Research Institute 26, Plocka Street, 01–138 Warsaw, Poland, tel. (+48 22) 431 22 29, fax (+48 22) 431 24 08, e-mail: e.radzikowska@wp.pl

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Introduction

Organising pneumonia (OP) is a disease resulting from the pulmonary reaction to noxious factors including infections, especially Mycoplasma pneumoniae, Chlamydia pneumoniae and viruses. It might be the consequence of exposure to toxic substances, drugs and radiotherapy. OP has been observed in autoimmunological and neoplastic disorders. However, in the majority of cases a stimulus to the development of OP is not determined [1–5].

The areas of OP often accompany lung cancer, not being the clinical, radiological or pathological predominant [6, 7]. A case of early endobronchial squamous cell carcinoma with organising pneumonia located distally to obstructed bronchus is presented. The right lower lobe resection has probably been sufficient treatment for both lung cancer and organising pneumonia. Having analyzed the literature, no similar co-existence of early endobronchial lung cancer and OP was noted.

Case report

The patient, a 65-year-old ex-smoker who stopped smoking 8 years ago (80 pack-years) and worked as a driver, was urgently admitted to the National Tuberculosis and Lung Diseases Research Institute on Nov 20, 2006 with tentative diagnosis of serious right lung pneumonia. His medical history revealed hypertension being treated for 6 years. Two weeks before admission the patient complained of a dry cough, shortness of breath and subfebrile status. The initial symptomatic treatment in the outpatient department was ineffective. Chest x-ray revealed a right lung pneumonia. Empirical therapy was administered with clarithromycin and cefuroxime, and the fever subsided. However, the patient still complained of a dry cough, pain in the thorax (increasing during deep inspiration), breathlessness and sweats. No weight loss was observed. As a consequence of the inefficacious outpatient treatment he was admitted to hospital with presumptive diagnosis of right lung pneumonia. On physical examination the patient was generally in good status, experiencing dyspnoea on exertion and tachycardia (HR — 104'). Auscultation revealed diminished breath sounds in the right lower lobe and numerous crepitant rales at the base of this lung. On admission, a chest x-ray disclosed an extensive irregular patchy area of air-space consolidation in the right lower zone with right hemidiaphragm elevation. A slight improvement in comparison with out-patient x-ray was observed (Fig. 1).

Chest CT scan demonstrated an irregular peripheral area of consolidation with air bronchogram in the right lower lobe contacting the inferior hilum probably with enlarged lymph nodes in this region (Fig. 2).

Bronchoscopy revealed that the right lower bronchus (B9) was narrowed by a whitish obstruc-

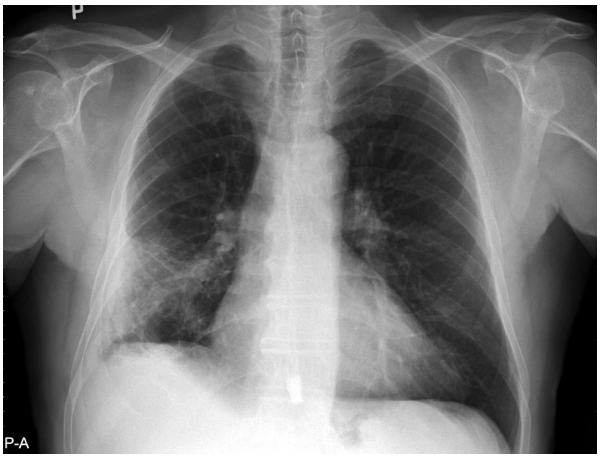

Figure 1. Chest radiograph showing extensive irregular patchy area of air-space consolidation in the right lower zone. The right hemidiaphragm is elevated

Rycina 1. RTG klatki piersiowej — intensywne, nieregularne zagęszczenia w dolnym polu płuca prawego. Uniesienie prawej kopuły przepony

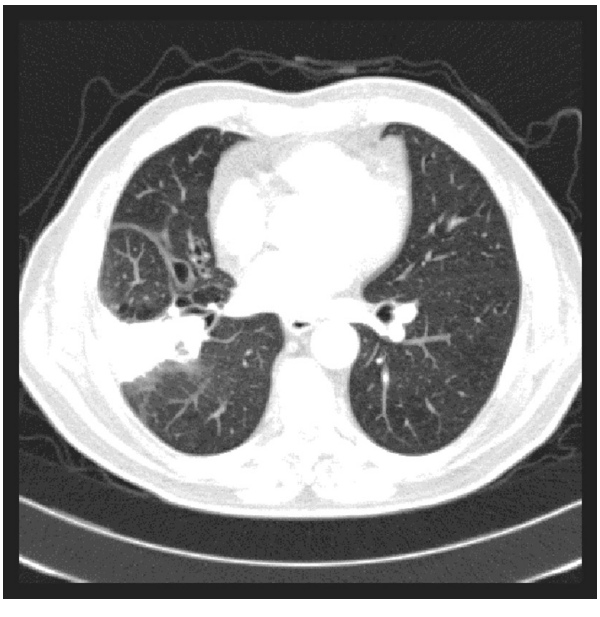

Figure 2. CT scans showing irregular peripheral area of consolidation with air bronchogram in the right lower lobe contacting the inferior hilum, probably enlarged lymph nodes in the region

Rycina 2. Tomografia komputerowa klatki piersiowej — nieregularne, konsolidujące się zagęszczenia z powietrznym bronchogramem w płacie dolnym prawym, łączące się z wnęką, z możliwością powiększenia węzłów chłonnych tej wnęki

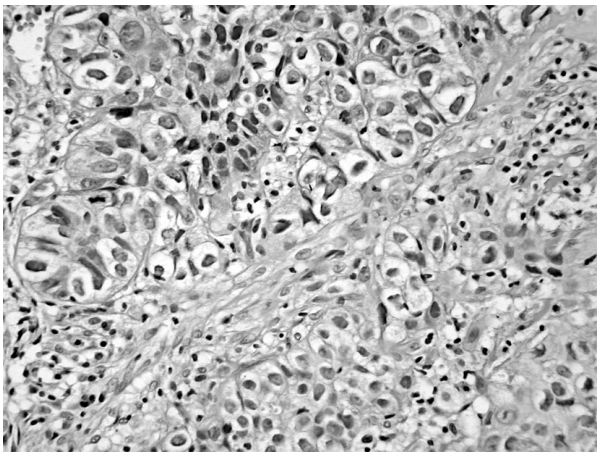

Figure 3. Specimen obtained from endobronchial biopsy. Squamous cell carcinoma infiltrate can be seen with a lymphoid reaction in stroma of bronchi. Microphotograph. H+E stain. High magnification (c. 400×)

Rycina 3. Wycinki z bronchoskopii. Naciek raka płaskonabłonkowego z reakcją limfoidalną w podścielisku oskrzela. Mikrofotografia. Barwienie H+E. Powiększenie (c. 400×)

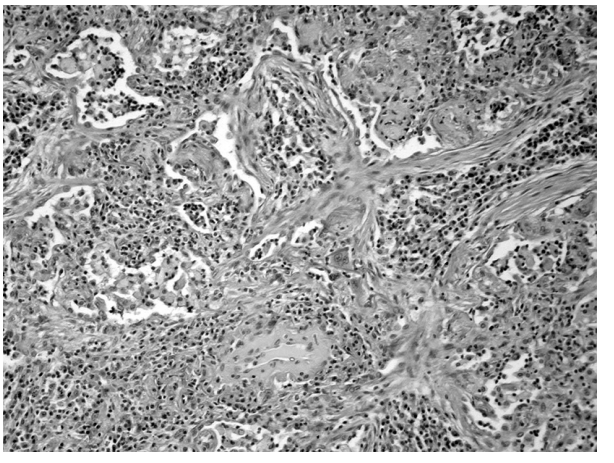

Figure 4. Lung biopsy specimen. Polypoid plugs of loose organizing connective tissue protrude into lumen of alveolar ducts and spaces. Architecture of the lung is preserved. The pleura is markedly thickened by fibrosis, chronic inflammatory infiltrate and oedema. Microphotograph. H+E stain. Low magnification (c. 100×)

Rycina 4. Badanie specimenu pooperacyjnego. Polipowate twory organizującego się wysięku zapalnego wypełniającego światło pęcherzyków i przewodzików pęcherzykowych. Zachowana architektonika płuca. Włókniste pogrubienie opłucnej z przewlekłym naciekiem zapalnym i obrzękiem. Mikrofotografia. Barwienie H+E. Powiększenie (c. 100×)

ting lesion. Pathological examination of bronchial sample and bronchial secretion disclosed squamous cell carcinoma (Fig. 3).

Bronchial secretion cultures were negative for bacteria, mycobacteria and fungi. Antibodies against Mycoplasma pneumoniae, Chlamydia pneumoniae and Legionella pneumophila were not found in the serum. Acute renal insufficiency (serum creatinine — 3 mg% = 265.2 μmol/l, blood urea — 86 mg% = 30.7 mmol/l) was an additional problem, probably as a result of hypertension, dehydration and out-patient antibiotics administration, requiring intensive care, and thus delaying the surgical treatment. Moreover, goiter with subclinical hyperthyroidism (TSH — 0.078 μlU/ml, pred — 0.27–4.2 μlU/ml) was diagnosed, which also had to be treated prior to operation. Lung function tests revealed decreased vital capacity — VC — 72.6% pred and FEV1 — 70.17% pred, when total lung capacity was within normal limits (TLC — 89.9% pred). Carbon monoxide diffusing capacity (TLCOs — 58% pred) was moderately decreased. When the renal parameters improved, the patient underwent radical surgical procedure. On Dec 07, 2006 the mediastinoscopy did not reveal metastases in the mediastinal lymph nodes. During thoracotomy a waxy greyish tumour measuring 70 × 50 × 60 mm was found and the right lower lobe was removed. Histological examination revealed a small focus of non-keratinizing squamous cell carcinoma in the right lower bronchus. Bronchoscopic samples were shown to contain the majority of lung cancer mass. There was also an inflammatory area with polypoid plugs of loose organising connective tissue protruding into the lumen of the alveolar ducts and spaces. The architecture of the lung was preserved (Fig. 4).

Pathological examination of a specimen confirmed diagnosis of squamous cell carcinoma G2 in stage pIA ($pT_1N_0M_0R_0L_0V_0$) as well as organising pneumonia secondary to lung cancer. The postoperative period was uneventful and the patient was discharged from hospital. Six months after the surgery he was in a good condition and radiological examination did not revealed any pathological lesions.

Discussion

Organising pneumonia (OP) is characterized by the accumulation of organized exudates within the alveoli, protruding into the small bronchioli and alveolar ducts in the form of polyps [5]. Its clinical manifestation comprises fever, dry or productive cough, dyspnoea of varying severity, chest pain, sweats and weakness [3, 4]. Bilateral, migratory parenchymal infiltrates with air bronchogram are most often radiological signs of OP but also nodular forms confined to one lung or disseminated, bilateral, reticulo-nodular forms of OP are also described. In addition, lymph node enlargement and pleural fluid are rarely seen [1–4, 8]. These

clinical and radiological findings can mimic pulmonary neoplasm. OP may be a disease accompanying lung cancer as a result of the direct influence of a tumour on the surrounding lung parenchyma or as a consequence of bronchial obstruction. Moreover, anticancer treatment (chemo- and radiotherapy) can induce OP [2, 4, 6–8]. Romero et al. found foci of OP in 33 patients, having analyzed specimens of 89 patients with lung cancer [7]. No single case displayed OP as a predominant form of pulmonary changes. These authors underline that OP most often co-exists with squamous cell carcinoma, which obstruct the bronchus, with additional surrounding foci of lipid pneumonia. Similarly our patient probably developed OP as a result of bronchial obstruction by squamous cell carcinoma, although foci of lipid pneumonia were not revealed. Mokhtari et al. presented 43 patients with OP and cancer, including 10 cases of lung cancer [6]. However, in this group of patients OP was diagnosed after chemo- or radiotherapy. Sanchez et al. found OP in the opposite lung of patients with adenocarcinoma, and Yan et al. described a patient with squamous cancer treated by surgery who developed OP after this procedure [9, 10]. Also Song et al. published a case of OP in the course of bronchoalveolar carcinoma [11]. The buds of granulation tissue in small bronchioles and alveoli were found near the tumour and in the opposite lung. A similar case was presented by Enomoto et al. [12]. A 50-year-old woman with broncholoalveolar carcinoma developed organising pneumonia in the opposite lung. Steroid therapy was administered and after resolution of the changes connected with OP she was surgically treated. Moreover, the case of a patient with broncholoalveolar carcinoma who developed severe OP as a reaction to cancer and docetaxel/gemcitabine chemotherapy was presented by Dols et al. [13].

The analysis of patients with lung cancer and organizing pneumonia enriches us with some diagnostic implications. The performance of many diagnostic evaluations and the exclusion of possible causes of OP are of great value. It is not possible to diagnose OP by radiological methods only. Infiltrates with air bronchograms, which are most commonly observed, occur in bronchoalveolar cancer, eosinophilic pneumonia and MALT lymphoma of the respiratory system [4, 8]. Often, transbronchial lung biopsy might be insufficient in the diagnosis of lung cancer with concomitant OP, and open lung biopsy with examination of the observed lesions should be performed.

On other hand, not only bronchial obstruction by tumour but also by foreign body or by bronchial exudates might initiate OP located distally to the narrowing [4]. In addition, this should be taken into consideration in differential diagnosis.

The standard treatment of OP is corticosteroids, but in same cases, spontaneous regressions were observed [1–4]. We think that surgery should be sufficient treatment of our patient; he is still under observation. The stimuli for OP development, such as the cancer and bronchial obstruction, were removed.

To sum up, a case of endobronchial squamous cell carcinoma in stage T1N0M0 with predominant clinical and radiological signs of OP is presented.

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