

A rare pulmonary complication in rheumatoid arthritis: Necrobiotic nodule

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Abstract: The necrobiotic pulmonary nodule is a rare complication of rheumatoid arthritis. Rheumatoid nodules are seen in less than 1% of the cases with pulmonary involvement. We present a case of necrobiotic nodule due to rheumatoid arthritis and discuss the radiological features in the light of literature.

Keywords: rheumatoid arthritis, Necrobiotic nodule, pulmoner mass.

INTRODUCTION

The necrobiotic pulmonary nodule, a rare complication of rheumatoid arthritis, is an entity that causes diagnostic challenge. It was found that the definitive diagnosis was a necrobiotic nodule, a rare pulmonary complication of rheumatoid arthritis, in a patient who was referred to our hospital with an initial diagnosis of pulmonary mass for trans-thoracic excisional biopsy. Here, we presented this case and radiological features of necrobiotic nodule in the light of literature.

CASE REPORT

A 49-years old woman presented to our hospital with mild dyspnea and low back pain. There was no cough, hemoptysis, chest and/or back pain or history of blood-tinged sputum. The patient was evaluated by chest radiograph and thorax CT scan in another facility. A coin lesion (about 2.5 cm in size) was seen at basal zone in left lung in evaluations performed. In her history, it was found out that the patient was followed with the diagnosis of rheumatoid arthritis over 5 years. The patient was referred to our hospital with an initial diagnosis of malignancy; however, biochemical evaluations and malignity markers were found to be within normal range in our hospital. RF was found to be positive whereas ASO and CRP were found to be high. In addition, PPD test was negative, which was ordered to exclude granulomatous disease. On thorax CT scan, a hypo-dense, solitary nodular lesion (26x23 mm in size) with lobulated contours which had necrotic appearance at central but no peripheral extension was detected at paracardiac zone in left lower lobe. Considering anamnesis, clinical findings, laboratory evaluations and CT images together, the lesion was considered as a necrobiotic pulmonary nodule, a rare complication of rheumatoid arthritis. Thus, CT-guided trans-thoracic biopsy was cancelled and it was decided to follow the patient with

clinical examinations, laboratory tests and imaging studies. The follow-up visits including physical examination, laboratory evaluations and chest radiography were scheduled by 3-months intervals while HRCT was planned by 6-months intervals. During follow-up of 2.5 years, the patient had an uneventful course. No significant alteration was detected in size and morphology of nodular mass.

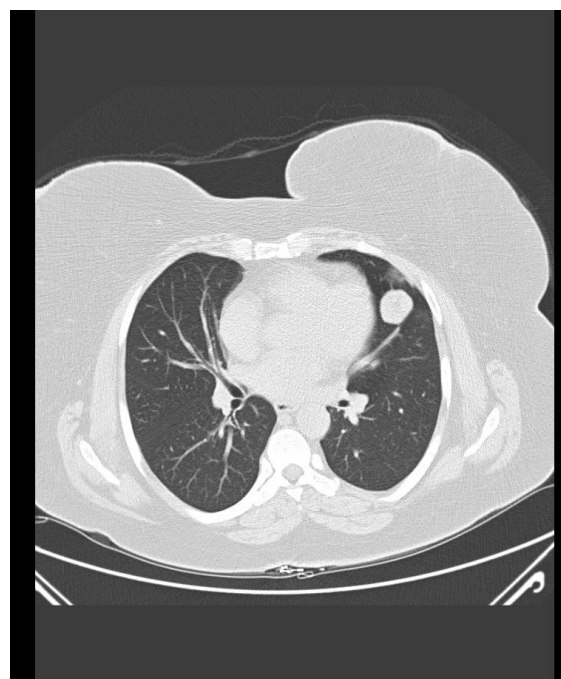


Fig 1: On thorax CT scan lung window, a solitary nodular lesion with lobulated contours at paracardiac zone in left lower lobe.

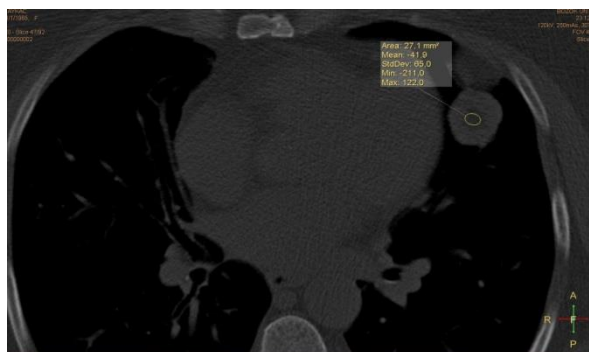


Fig 2: Hypodense, solitary nodular lesion (26x23 mm in size) which had necrotic appearance at central but no peripheral extension.



Fig 3: On intermediate window, solitary nodular lesion which had necrotic appearance.

DISCUSSION

Rheumatoid arthritis (RA) is a frequently seen inflammatory and destructive arthropathy. Rheumatoid nodules are seen in less than 1% of the cases with pulmonary involvement. Differential diagnosis is warranted for these lesions which can be seen as single or multiple nodules with ability to form cavities in radiological evaluations. Other potential causes include infections including tuberculosis, metastatic nodules, septic embolism and Wegener granulomatosis. In RA, other pulmonary complications can manifest as different clinical pictures such as pleuresis, interstitial pulmonary fibrosis, bronchiolitis obliterans, bronchiectasis and pulmonary arteritis. Rheumatoid necrobiotic nodules are often localized sub-pleural pulmonary parenchyma at lower lobes. The cavities have thick walls with smooth inner surface while wall can become thinner and disappear by remission of arthritis.

Although RA is more common among women, rheumatoid pulmonary disease can develop more frequently in male patients with sustained disease, positive rheumatoid factor and subcutaneous nodules. In RA, respiratory involvement is one of the most frequently observed extra-articular findings of the disease. Occasionally, rheumatoid pulmonary disease can be life-threatening and increases risk for mortality by influencing morbidity [1]. Pulmonary complications of RA include pleuresis, interstitial fibrosis,

parenchymal nodules, airway involvement, bronchiolitis obliterans, bronchiectasis or pulmonary arteritis. In addition to primary pulmonary involvement, secondary causes such as smoking, medication, infection or tumoral causes can lead pulmonary complications in RA [1, 2]. Although RA is more common among women, rheumatoid pulmonary disease can develop more frequently in male patients with sustained disease, positive rheumatoid factor and subcutaneous nodules [1]. The most common finding is asymptomatic pleural involvement in rheumatoid pulmonary disease; however, pulmonary nodulosis or interstitial pulmonary disease can also accompany to pleural involvement [3]. In the literature, there are only 4 case reports including 7 patients on pulmonary nodule development prior to articular findings in the literature [4, 7].

Rheumatoid pulmonary nodules are seen in less than 1% of RA patients, while they rarely develop before clinical findings of rheumatoid arthritis [1]. In some cases, pulmonary nodule can occur simultaneously with arthritis in clinical practice. Rheumatoid pulmonary nodules can be single or multiple and they are often localized at middle lobe or peripheral zones of upper lobes. Diameter of the nodules can vary from a few millimeters to centimeters [1, 10, 11]. Rheumatoid pulmonary nodules can be detected on chest radiographs by 1% while this rate reaches up to 22% in advanced imaging modalities such as CT scan [12]. Rheumatoid pulmonary nodules can be either single or multiple with cavitory lesions in 50%. Cavitation was observed in our case; however, the patient had no clinical finding of tuberculosis with negative cultures for tuberculosis. Although pathogenesis of rheumatoid pulmonary nodules is unclear, it has been proposed that it may be caused by vasculitis resulting from immune complex deposition [1, 4]. The onset of RF positivity long before clinical findings suggests that rheumatoid and pulmonary nodules may have common pathophysiology. Some hypotheses have been proposed in the support of this theory. Presence of mononuclear and polymorphonuclear cells in both synovial fluid and BAL fluid, presence of rheumatoid nodules in both lungs and joints, similarity of pleural granulomatous tissue to synovial pannus and responsibility of inflammatory cell infiltrates in cell damage in both areas support this theory [1, 4, 9].

In RA, development of characteristic pulmonary symptoms at early period is an extremely rare condition. There are scarce reports on pulmonary involvement at early RA [4-7]. Laloux *et al.*; reported a 50-years old woman with simultaneous development of multiple pulmonary nodules and severe interstitial fibrosis [4]. Rheumatoid nodule was diagnosed by excisional biopsy in that case. Hull and Mathews reported 2 patients who had necrobiotic nodules as initial complaint of rheumatoid arthritis [5]. Scadding *et al.*; [6] and Erant *et al.*; [7] reported cases with

pulmonary nodulosis that developed before onset of articular disease. It has been proposed that latent period between pulmonary and articular disease can vary from 6 to 11 years. However, differential diagnosis in pulmonary nodules was made by histopathological evaluation of materials obtained from excisional or needle biopsy due to incapacity of serological test and imaging modalities at that time. In our case, infectious diseases such as tuberculosis, brucellosis and malignant diseases and paraneoplastic conditions were investigated but no suggestive finding was found. Likelihood of silicosis or methotrexate-related nodulosis was eliminated by newly diagnosed nodule, lack of history of silica exposure or medication that can cause nodulosis. No excisional biopsy was required because of characteristic clinical picture and imaging findings.

CONCLUSION:

In conclusion, rheumatoid pulmonary disease can develop before or simultaneously with articular findings. It is recommended that clinicians should have to keep extra-articular findings that may manifest differentially at onset of rheumatoid arthritis in mind and that advanced imaging modalities are of importance in the management of disease. Necrobiotic nodules are observed in 0.2% of chest radiographs of RA patients and subcutaneous nodules are more common among men in particular. The nodules can be single or multiple with varying sizes from a few millimeters to 7 cm. They may also exhibit cavitation [13, 16, 20]. Typically, these nodules tend to localize at peripheral zones of middle-upper lobes [13, 17]. Rheumatoid nodules are generally asymptomatic. However, they can occasionally cause hemoptysis [14, 16, 18].

These nodules are generally excised for differential diagnosis. Pulmonary nodules mimic subcutaneous nodules in histopathological manner with necrotic cells at central of the lesion, lymphocytic infiltration and fibrosis at periphery and a cellular palisade between them [2, 3, 6]. In general, nodules aren't treated but corticosteroid may be used in those causing airway obstructions. Effusion, pneumothorax or bronchopleural fistula may develop due to rupture of nodule to pleura, which may require surgery [13, 18]. Cavitation may be seen in up to 50% of the nodules. In general, rheumatoid pulmonary nodules have a benign clinical course. The main issue is to discriminate a necrobiotic nodule from other malign or granulomatous infectious diseases. In differential diagnosis, HRCT is helpful as a non-invasive technique. In a study investigated pulmonary involvement in RA by using HRCT, it was shown that HRCT is more sensitive than chest radiographs. It was found to be both non-invasive and inexpensive with strong correlation to respiratory function tests when compared to open biopsy.

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