

## Lung Actinomycosis with Elevated Serum IgG4 and IgG4-positive Plasma Cell Infiltration

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### Background:

High serum IgG4 level and IgG4-positive plasma cell infiltration are hallmarks of IgG4-related disease, but these are also observed in various other disease conditions. Infection is one important category in these conditions; actually, high serum IgG4 is reported both in bacterial and viral infections and IgG4-positive plasma cell infiltration is reported in pulmonary abscess. Herein, we would like to present a case of lung actinomycosis (*Rothia aeria* lung infection) with elevated serum IgG4 and IgG4-positive plasma cell infiltration. This is the first case report that describes the association of *Rothia aeria* with IgG4.

### Methods & Materials:

This is a case report of a patient who visited Kyoto University Hospital.

### Results:

(Case presentation) A 46-year-old man visited our hospital because of worsening cough and hemoptum. A chest computed tomography (CT) scan showed a consolidation in the left upper lobe. He refused hospital admission for further examination, and was followed up in the outpatient office. Three months later, the consolidation got larger with cavity formation. Bronchofiberscopy was performed twice without any significant finding. Four months after the first visit, laboratory tests revealed elevated levels of IgG4 and PR3-ANCA. He was admitted to our hospital, and, with a suspicion of granulomatosis with polyangitis (GPA), CT-guided lung biopsy was performed. Microscopic examination revealed IgG4-positive plasma cell infiltration (IgG4-positive cells / IgG-positive cells =26%) without necrotizing vasculitis or granuloma, but didn't lead to definite diagnosis. Surgical lung biopsy was considered for diagnosis, but a sputum culture performed a week before the CT-guided lung biopsy detected *Rothia aeria*, pleiomorphic gram-positive bacteria that belong to actinobacteria. Antibiotic treatment was started, and chest X-ray findings markedly improved. The titer of IgG4 returned to normal range, and the titer of PR3-ANCA also declined. The clinical course was compatible with lung actinomycosis (*Rothia aeria* lung infection). Four months of antibiotic treatment was completed and he is now followed up in the outpatient office without clinical relapse.

### Conclusions:

We experienced a case of lung actinomycosis with elevated serum IgG4 and IgG4-positive plasma cell infiltration. This case suggests a possible role of IgG4 in the immune reaction against actinobacteria.