Wegener's Granulomatosis with Neurological and Endobronchial Involvement: Case Report

Nörolojik ve Endobronşiyal Tutulumuyla Bir Wegener Granülomatozis Olgusu

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ABSTRACT We present a case of Wegener's granulomatosis with endobronchial and neurological involvement which was initially misdiagnosed as bronchiolitis obliterans organizing pneumonia and tuberculous otitis. The findings in computed tomography of the thorax and positron emission tomography were highly suggestive of malignancy. Fiberoptic bronchoscopy showed an endobronchial lesion totally obstructing the orifis of the left lower lobe. Before the pathologic diagnosis, peripheral facial palsy was added to the clinical course of the patient. Wegener's granulomatosis was diagnosed with the aid of biopsies taken from the endobronchial lesion and the nasal cavity. Cranial neuropathy with the incidence of 6% and endobronchial involvement with the incidence of 16% are quite rarely seen patterns of involvement in Wegener's granulomatosis. We present this unique case in whom two rarely seen patterns of involvement were coincident with review of literature.

Key Words: Wegener granulomatosis; neurologic manifestations; respiratory system abnormalities; facial paralysis

ÖZET Bu makalede, ilk olarak bronşiyolitis obliterans organize pnömoni ve tüberküloz otit tanılarını almış olan endobronşiyal ve nörolojik tutulum ile seyreden bir Wegener granülomatozis olgusu sunulacaktır. Toraks bilgisayarlı tomografi ve pozitron emisyon tomografi bulguları akciğer kanserini taklit etmektedir. Fiberoptik bronkoskopide sol alt lob girişini tam tıkayan endobronşiyal lezyon tespit edilmiştir. Patolojik tanıya ulaşılmadan önce hastada periferik fasiyal paralizi geliştiği gözlenmiştir. Wegener granülomatozis tanısına endobronşiyal lezyondan ve nazal mukozadan alınan biyopsilerin yardımı ile ulaşılmıştır. Wegener granülomatoziste endobronşiyal tutulum %16, kranial nöropati ise %6 oranında görülmekte olup oldukça nadir bulgulardır. Nadir görülen iki tutulum paterninin bir arada bulunduğu bu olgu literatürler eşliğinde sunulmuştur.

Anahtar Kelimeler: Wegener granülomatozisi; nörolojik belirtiler; solunum sistemi anormallikleri; fasiyal paralizi

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Wegener's granulomatosis (WG) is the most common form of the ANCA-associated vasculitis that is characterized by a triad of upper airway involvement (sinusitis, otitis, ulcerations, bone deformities and subglottic stenosis), lower respiratory tract involvement (cough, chest pain, shortness of breath, hemoptysis and bronchial stenosis) and glomerulonephritis.[1] WG, which is a necrotizing granulomatous vasculitis, less frequently effects orbita, middle ear, joints, muscles, nervous

system and gastrointestinal system.[2] We presented a case who had been misdiagnosed as bronchiolitis obliterans organizing pneumonia (BOOP) and tuberculous otitis, showing neurological and endobronchial involvement, both of which are rarely seen clinical manifestations of WG.

CASE REPORT

A forty-one year-old woman who had the complaint of cough for the last three months underwent open lung biopsy and decortication for pleurisy. The pathological examination revealed the diagnosis of BOOP. After the operation the patient had left the hospital of her own will so further investigations about the possible causes of BOOP could not be made and the patient did not take any medications. Three months later, the patient was hospitalized in a neurology clinic for otalgia, vertigo and loss of hearing. Cranial magnetic resonance imaging was totally normal. Bilateral mixed type loss of hearing was found in audiometric examination. Temporal computed tomography (CT) showed soft tissue masses filling the middle ear and mastoid antrum. The patient with a diagnosis of tuberculous otitis based on physical examination and CT findings was sent to our tuberculosis clinic by Ear, Nose and Throat (ENT) department.

In her physical examination, respiratory sounds were diminished on the left subscapular region. Routine biochemistry was totally normal except hypoalbuminemia. Complete blood count was as follows; white blood cell: 16.000/mm^3, hemoglobin: 9.1 g/dL, platelet: 624.000/mm^3. Sedimentation was 90 mm/h; CRP was 28.7 mg/dL. Urinary tests revealed hematuria and creatine clearance was as low as 87/3 mL/min. Sputum, otorrhea and wound (due to surgical incision) smear stains for acid-fast bacilli (AFB) were all negative. Purified protein derivate test was negative, too. Thorax CT revealed a cavitary mass lesion in the left lower lobe and left-sided pleurisy which was thought to be recurrent after decortication performed during first hospitalization (Figure 1).

Pleural fluid was exudative. Pleural adenosine deaminase (ADA) level was normal. In direct microscopy, 50% of the cells were lymphocyte, 50% of the cells were leukocyte. Pleural fluid smear stain for AFB was negative. During fiberoptic bronchoscopy, an endobronchial lesion totally obstructing the orifice of the left lower lobe was seen. Positron emission tomography (PET-CT) which was performed for the suspicion of malignancy, revealed high uptake of 18F-FDG in the cavitary

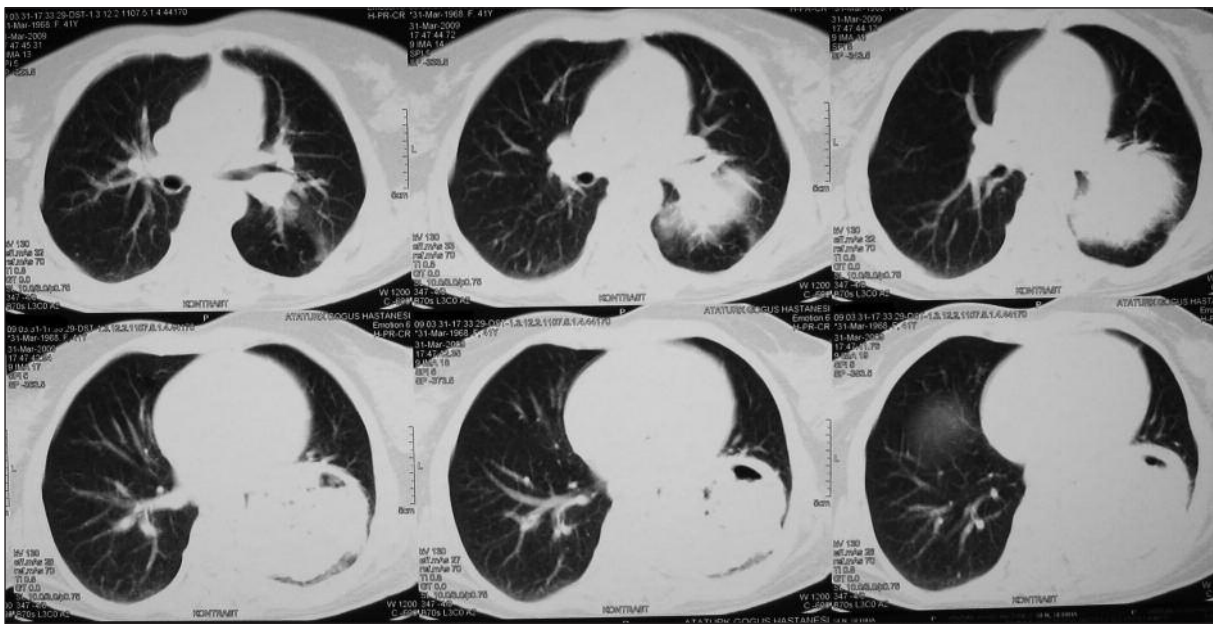

FIGURE 1: Thorax CT revealing cavitary mass lesion in the left lower lobe.

mass lesion extending from left hilus (SUVmax: 12.20), in mastoid antrum, middle ear cavity, around the Eustachian tube (SUVmax: 7.4), bone marrow and spleen in a diffuse pattern. Bone marrow aspiration biopsy was consistent with normocellular bone marrow in which granulomatous lesion, myelofibrosis or malignant blasts did not exist. During follow-up in our clinic, the patient presented new symptoms consistent with peripheral facial palsy. After consultation with ENT and neurology departments, systemic steroid therapy was initiated for facial palsy. The pathological examination of bronchoscopic biopsy demonstrated focal microabscesses in a geographic style which indicates vasculitis. The nasal biopsies taken from left and right septum and left concha were also consistent with vasculitis showing granulomatous necrotizing inflammation. Additional to these findings, cytoplasmic anti-neutrophil cytoplasmic antibody (c-ANCA) positivity supported the diagnosis of WG. Clinical and radiological improvement was achieved with medical therapy including systemic steroid, cyclophosphamide and co-trimoxazole in six months (Figure 2).

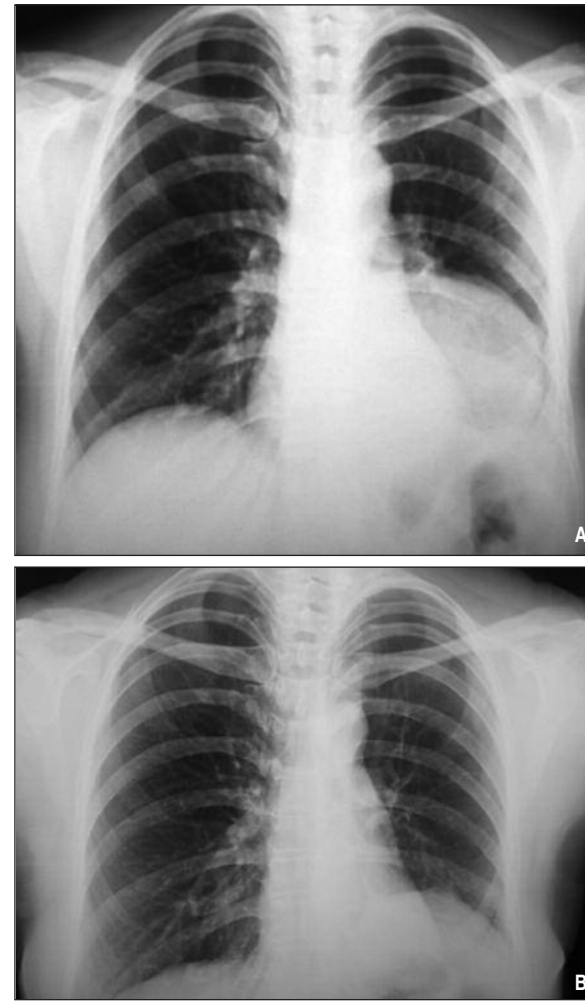

FIGURE 2: Chest X-ray before **(A)** and after treatment **(B)**.

DISCUSSION

WG with its well-known triad is called generalized form of the disease whereas limited form lacks renal involvement and other systemic vasculitic signs. Limited form frequently involves the head and the neck region; and may not always progress to generalized disease, with resultant better prognosis.[3]

In pathologic examination of vasculitis, accompanying areas with a pathologic appearance of BOOP can be seen. In this situation, consultation from an expert pathologist on pulmonary diseases must be considered. In our case, limited form of the disease which was misdiagnosed as BOOP progressed to generalized form. Endobronchial and cranial nerve involvement, both of which are rare manifestations were seen during the follow-up of the patient.

Although pulmonary involvement is detected in 85% of the patients, endobronchial lesions and pleural involvement are quite rare.[4,5] Pleural effusion which was the initial presentation of our case has rarely been described as an initial manifestation of WG in literature. Pleural lesions are present in only 10% of WG patients with initial pulmonary involvement. Pleural thickening and pleural effusion are the most frequent signs. The pleural exudate is usually sterile and shows neutrophil predominancy.[6] A case with eosinophilic effusion was also reported by McCann et al.[7]

The incidence of endobronchial involvement in WG was reported to be as low as 16% by Koyama et al.[8] Endobronchial involvement can be as tracheobronchial stenosis, bronchial wall thickening, ulcerations, hemorrhage, secretions and intraluminal masses.[4] WG with endobronchial lesions (EBL) can cause atelectasis. Hirsch et al., reported a case in whom the only manifestation of WG is severe proximal bronchial stenosis that responded

well to IV cyclophosphamide and oral co-trimoxazole.[9] But some cases may require further intervention. Endoscopic dilatation combined with laser ablation is recommended as the first step, but for further enlarging the airway and maintaining patency, stenting is required. None of these interventions can provide a life long patency. The longest duration of airway patency was reported to be 5-years.[10] In our case, left lower lobe orifice was obstructed by an EBL. As there was not a severe proximal bronchial stenosis, no further intervention was required. However, the mass lesion detected on thorax CT and the presence of EBL raised suspicion for diagnosis of malignancy. PET performed for differential diagnosis, showed high uptake in lesions in the lung, upper airway, middle ear, bone marrow and spleen. It is known that radiolabeled glucose analogue 18F-fluoro-deoxyglucose (18F-FDG) used in PET-CT, accumulates in both malignant and inflammatory tissues. There are increasing data demonstrating the role of PET-CT in the diagnosis and follow-up of large vessel vasculitides, including Takayasu Arteritis and giant cell arteritis.[11] In a study of Walter et al, a visual grading of vascular 18F-FDG uptake which was validated for representing the severity of inflammation was reported to have specificity of 99.8% and sensitivity of 60%.[12] High specificity of PET-CT in diagnosis of vasculitis is related to its ability in discriminating arteritis from active atherosclerosis. High sensitivity can also be achieved if scanning is performed during active inflammatory phase.[13] There are a few case reports of WG in which F-18 fluorodeoxyglucose-positron emission tomographic scanning yielded a false-positive result.[14-16] Ueda et al. pointed out that Integrated PET/CT could be considered to be useful to confirm the distribution and determine the optimal site for biopsy in WG.[16] But the role of PET-CT in diagnosis and follow-up of WG needs to be investigated.

Cytoplasmic ANCA (c-ANCA) is a good diagnostic tool for WG with its high sensitivity (73%) and specificity (99%). We showed c-ANCA positivity in our case but false positivity of c-ANCA in tuberculosis, Hodgkin's disease, HIV infection and monoclonal gammopathy must be kept in mind.[17]

Radiologic findings of WG on CT included multiple pulmonary nodules, masses of varying size, cavities and consolidations with air bronchogram. Bronchovascular bundle thickening and lymph node swelling were also seen on CT.[18] Therefore, it can mimic pneumonia, malignancy or tuberculosis. PET-CT may raise concerns for an inflammatory or malignant process. Tissue biopsy may be inevitable for differential diagnosis in some cases like ours.

Neurological involvement in WG is seen in 25-54% of the patients.[19] Peripheral neuropathy is the most common neurological feature with incidence of 16%. Cranial neuropathy is less frequent with the incidence of 6%. Cranial nerves II, VI and VII are the most commonly affected ones. Granulomatous inflammation of the meninges occurs rarely (2-8%).[2] Three mechanisms mentioned for neurological involvement by Drachman were direct invasion from the nasal granuloma, granulomatous lesions remote from the nasal granuloma and vasculitis of the nervous system.[20] In our case, we hypothesized that direct invasion from the granuloma in the mastoid antrum might cause peripheral facial palsy.

Finally, this case was very unique for many aspects. The initial manifestation with pleurisy pointed out that pleural effusion can be a manifestation of vasculitis and WG so, this diagnosis should be considered if infectious and malignant diseases have been ruled out.[5] Endobronchial lesion and positive results of PET-CT could lead a misdiagnosis of malignancy in this case. But it should be kept in mind that WG could yield false positive results on PET-CT. Although it is a rarely seen manifestation, WG should be considered in the differential diagnosis of endobronchial lesions particularly in patients with symptoms involving upper air way and ear. Concomitant neurological involvement was also emphasized for its rarity.

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