

Lung Carcinoma with Orbital Metastasis: Two Cases

Orbital Metastazlı Akciğer Karsinomu: İki Olgu

İlker Yılmam¹, Ebru Çakır Edis¹, Serdar Solak², Hande Güçlü³

Abstract

While metastases of the lung, liver, adrenal glands, skeletal system and cranium can frequently be detected at the diagnosis stage of lung cancer, as the primary cause of cancer-related death around the world, orbital metastases are less frequently observed. Metastatic orbital masses account for 3–7% of all orbital tumors, while the most common tumors that metastasize to the orbit are those affecting the prostate, breast and lung. Despite advances in diagnostic methods over the years, orbital metastases are often overlooked, and diagnosis can be difficult. Radiological imaging methods are highly important for the evaluation of metastasis. Orbital metastases were identified on magnetic resonance imaging (MRI) in both patients in the present study, both of whom developed visual impairment after being diagnosed with primary lung cancer, and were not considered for diagnostic invasive interventions due to the primary disease. Underlying neoplastic diseases should be considered during differential diagnoses of visual disturbances.

Keywords: Orbital metastasis, lung carcinoma, visual impairment.

Öz

Dünyada kansere bağlı ölümlerin ilk nedeni olan akciğer kanserlerinde tanı aşamasında akciğer, karaciğer, adrenal bezler, iskelet sistemi ve kranial metastazlar sıklıkla saptanabilirken, orbital metastazlar ise nadiren görülmektedir. Metastatik orbital kitleler, orbital tümörlerin %3-7'sini oluşturur. Orbitaya en sık metastaz yapan tümörler prostat, meme ve akciğer tümörleridir. Yıllar içerisinde tanısal metodlardaki gelişmelere rağmen orbital metastaz tanısının konulması zor olabilir ve gözden kaçabilmektedir. Radyolojik görüntüleme yöntemleri metastaz değerlendirmesinde oldukça önemlidir. Primer akciğer kanseri tanısı konulan ve görme bozukluğu gelişen iki olgumuzda magnetic resonance imaging (MRI) ile orbita metastazı saptandı ve primer hastalık göz önünde bulundurulduğunda tanısal amaçlı invazif girişim düşünülmeydi. Görme bozukluklarının ayırıcı tanısında altta yatan neoplastik hastalıklar da düşünülmelidir.

Anahtar Kelimeler: Orbital metastaz, akciğer karsinomu, görme bozukluğu.

¹Department of Pulmonology, Trakya University Medical Faculty, Edirne, Türkiye

²Department of Radiology, Trakya University Medical Faculty, Edirne, Türkiye

³Department of Ophthalmology, Trakya University Medical Faculty, Edirne, Türkiye

¹Trakya Üniversitesi Tıp Fakültesi, Göğüs Hastalıkları Anabilim Dalı, Edirne

²Trakya Üniversitesi Tıp Fakültesi, Radyoloji Anabilim Dalı, Edirne

³Trakya Üniversitesi Tıp Fakültesi, Göz Hastalıkları Anabilim Dalı, Edirne

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Correspondence (İletişim): İlker Yılmam, Department of Pulmonology, Trakya University Medical Faculty, Edirne, Türkiye

e-mail: drilkeriyilmam@gmail.com



Lung cancer is the leading cause of cancer-related death worldwide, with non-small cell lung cancer (NSCLC) accounting for approximately 80% of all cases (1). As more than two-thirds of NSCLC cases are locally advanced or metastatic at the time of diagnosis, the 5-year survival rate is approximately 16% (2,3). Distant metastases most commonly occur in the lung, pleura, bone, skull and liver, while orbital metastases are rarely observed in NSCLC cases (4,5). Metastatic orbital tumors are rare, accounting for only 1.5–12% of all orbital tumors, among which the most common sites are the breast, lung, prostate and skin (melanoma). It should be kept in mind that patients with metastatic orbital tumors may present with unusual symptoms (6).

We present here two non-smoker female cases of lung cancer with orbital metastases who developed symptoms of visual disturbance.

CASE

Case 1: A female 73-year-old non-smoker with known diagnoses of diabetes mellitus, hypertension and hypothyroidism presented with complaints of dyspnea on exertion, nausea and vomiting, left eye pain and visual disturbance for about a month. An ophthalmologist at an out-of-town center had recommended glasses and medical treatment for the patient. The patient was admitted to our Pulmonary Diseases Clinic with complaints of shortness of breath in January 2022, and a PA chest radiograph revealed a right hilar mass and pleural effusion, upon which the patient was admitted to the hospital. Thorax CT and PET-CT (Figure 1) imaging were performed to identify any malignancy, the latter of which revealed increased FDG uptake from lesions measuring 30x20mm located in the central part of the upper lobe and 55x40mm in the distal middle lobe, as well as mediastinal lymph nodes and multiple extrathoracic metastases (both lobes of the liver, multiple areas of vertebrae, the sixth right costae, sacrum, bilateral iliac bone and left acetabulum) (SUV max 5.1–6.0).

Cranial MR and orbital MR examinations (Figure 2) requested and evaluated by the neurology clinic revealed a left orbital mass lesion and multiple cranial metastases. The patient underwent whole brain radiotherapy (RT) to 30 grays and concomitant edema treatment. A tru-cut biopsy of the axillary lymph nodes was made for the clarification of the primary disease, and the pathology revealed carcinoma infiltration. The patient underwent a single course of chemotherapy with carboplatin + paclitaxel in the medical oncology clinic. On day 3 following chemotherapy and 40 days after diagnosis, the patient presented to the emergency department complaining of dyspnea, and tube thoracostomy revealed a massive pleural effusion in the right hemithorax. The pa-

tient died one day after the procedure (re-expansion pulmonary edema? myocardial infarction?).

Case 2: A 69-year-old non-smoking female patient presented with shortness of breath on exertion and wheezing in April 2022. Upon the detection of a mass lesion on a chest X-ray, a PET-CT examination was performed and increased FDG uptake was observed in a 35x 25mm mass lesion in the right upper lobe, in the mediastinal lymph nodes (SUVmax: 10.5) (Figure 3) and in a nodular thickening measuring 17x18 mm in the left adrenal gland (SUVmax: 7.4).

The patient underwent bronchoscopy on May 2022, upon which the right upper lobe entrance was observed to be narrowed by an endobronchial tumor lesion. The bronchial biopsy result was reported to be consistent with lung adenocarcinoma. The patient developed visual impairment and so underwent a Cranial MRI, upon which choroidal metastases and findings consistent with secondary retinal detachment were observed in both cerebral hemispheres and the bilateral orbits (Figure 4). Afatinib treatment was started due to the patient's drug sensitivity following the detection of an EGFR exon 19 deletion mutation in the patient. RT treatment was planned as whole brain + bilateral choroid and was given as a total of 30 grays in 10 fractions, and a subsequent partial improvement in the visual impairment was observed. In addition, 25.5 grays RT (T 9 and T 11 vertebrae) was applied for bone metastases. The patient died in the district state hospital to which she presented 3 months after diagnosis in August 2022.

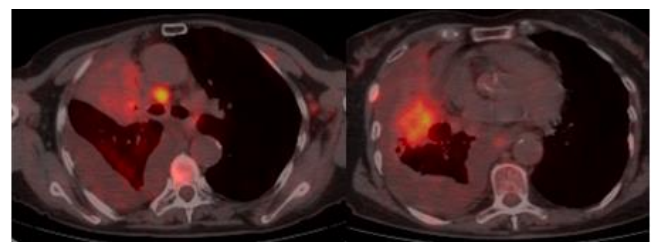


Figure 1: PET-CT Imaging of Case 1: Increased FDG uptake in the right lower paratracheal lymph node, 30x20mm in the central part of the upper lobe and 55x40mm in the distal middle lobe (SUVmax:5.1- 6.0)

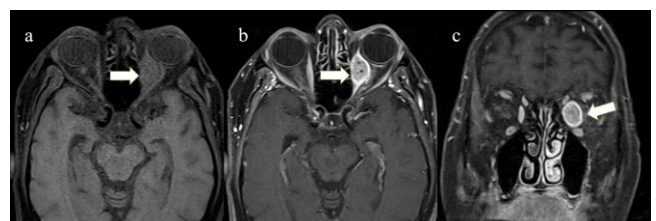


Figure 2: Axial pre-contrast (a) and postcontrast (b) with coronal post-contrast (c) fat-saturated T1-weighted fast-spin echo images showing a mass with contrast enhancement in the belly of the left medial rectus muscle, Case 1

DISCUSSION

Metastatic lung cancer can present with a variety of clinical pictures, with the most common clinical symptoms being fatigue, weight loss, chest pain, shortness of breath, hemoptysis and bone pain. As these common symptoms are also suspicious for lung cancer, patients usually undergo examinations for primary lung cancer. Orbital masses are rare metastases of lung cancer, the first consequence of which is visual disturbance, as in our case. Case 1 presented here had long complained of fatigue, although it was the development of double vision that first prompted her to see a doctor, who prescribed glasses. In the second case, visual impairment developed after the patient was diagnosed with lung carcinoma.

Orbital metastases from cancer are rare, accounting for only 3–7% of orbital lesions and 10% of orbital tumors. The most common primary tumor sources of metastases are those of the breast (39–48%), prostate and skin (melanoma) (12%), kidney (7–11%) and lung (8%) (7-9), and the most common symptoms at presentation are diplopia (48%), pain (42%), proptosis (26%) and decreased vision (16–30%) (10-12).

Orbital metastases originating from extraocular masses are predominantly unilateral and only very rarely involve the extraocular musculature (13), with the upper lateral extraconal quadrant being most commonly involved. The appearance of metastatic lesions on computed tomography (CT) is highly variable, although they usually present as soft tissue-density masses in the extraconal compartment (14). Viewed on magnetic resonance imaging (MRI), metastatic lesions are usually isointense on T1-weighted images and hyperintense on T2-weighted images when compared to extraocular muscles (14), and variable (heterogeneous) enhancement patterns are generally observed. Our patients had these typical findings, except that the metastatic lesion was localized in the medial compartment.

The failure of the ophthalmology clinic to recommend pathologic confirmation of the orbital mass lesions in both of the presented patients led to them being accepted as metastasis, considering the underlying malignancy. Invasive operations for orbital metastasis were not considered in either patient. While Case 1 was recommended only for whole brain RT, the RT treatment of Case 2 was whole brain + bilateral choroid. In such treatments, the primary goal is to protect the optic nerve from irradiation as much as possible (15).

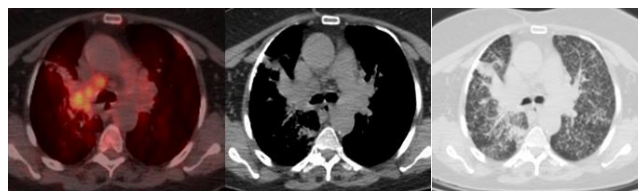


Figure 3: PET-CT Imaging of Case 2: Increased FDG uptake in a 35x25 mm soft tissue mass in the upper lobe and mediastinal lymph nodes

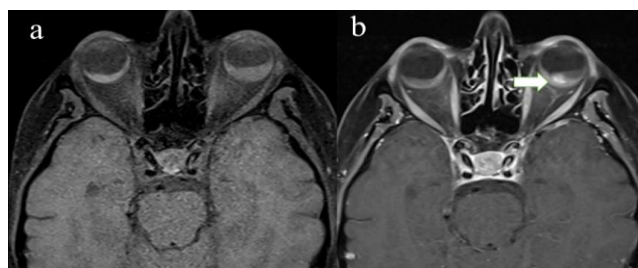


Figure 4: Axial pre-contrast (a) and postcontrast (b) fat-saturated T1-weighted fast-spin echo images of the left globe showing a nodular mass with contrast enhancement in the uvea along with retinal detachment, Case 2

The prognosis of patients with orbital metastases is poor (16). The clinical status of patients is dictated by the type of primary tumor, the rate of progression and the patient's immunologic status (4). In a case presented by Varol et al. (16), a patient with bilateral retrobulbar metastases died two months after diagnosis. Similarly, the cases in the present study had both developed metastases in distant organs and the tumors progressed aggressively, and both patients died within three months of diagnosis.

In conclusion, orbital mass lesions are rare metastases in cases with lung tumors. Although rare, the first symptom in primary lung cancers may be visual impairment, and so in the differential diagnosis of visual impairments, the underlying malignancy and the potential for orbital metastases should not be ignored.

CONFLICTS OF INTEREST

None declared.

AUTHOR CONTRIBUTIONS

Concept - İ.Y., E.Ç.E., S.S., H.G.; Planning and Design - İ.Y., E.Ç.E., S.S., H.G.; Supervision - İ.Y., E.Ç.E., S.S., H.G.; Funding - İ.Y., S.S., H.G.; Materials - İ.Y., E.Ç.E.; Data Collection and/or Processing - İ.Y., E.Ç.E., S.S.; Analysis and/or Interpretation - İ.Y., E.Ç.E.; Literature Review - İ.Y.; Writing - İ.Y., E.Ç.E.; Critical Review - İ.Y., E.Ç.E., S.S., H.G.

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