

CASE REPORT

Acute Abducens Nerve Palsy after COVID-19 in a Patient with Diabetes Mellitus

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Abstract

Sars-Cov-2 infection, which mostly affects the respiratory tract, can also impact the nervous system. It is one among the virus's neurological symptoms, along with anosmia, agusia, headache, dizziness, and decreased awareness. Occlusive vascular disorders, Miller Fisher Syndrome and cranial nerve palsy are more common due to coronavirus disease-19 (COVID-19). Microvascular peripheral nerve injury is the most common cause of abducens nerve palsy, which recovers spontaneously over time. One of the most common risk factors for microvascular ischemic 6th nerve palsy is diabetes mellitus (DM). The presence of COVID-19 and diabetes is associated with a higher risk of thromboembolic events. We present the abducens nerve palsy that developed after coronavirus disease (COVID-19) in a DM patient without any other diabetes-related complications.

Key Words: COVID-19, diabetes mellitus, nerve palsy

Diabetes Mellitus Olan Bir Hastada COVID-19 Sonrası Akut Abducen Sinir Felci

Özet

Çoğunlukla solunum yollarını etkileyen Sars-Cov-2 enfeksiyonu nörolojik tutulumu da neden olabilir. Anosmi, agusia, baş ağrısı, baş dönmesi ve azalmış farkındalık ile birlikte virüsün nörolojik semptomlarından biridir. Koronavirüs hastalığına (COVID-19) bağlı olarak Miller Fisher Sendromu, kraniyal sinir felci ve tıkaçıcı damar hastalıkları giderek daha fazla bildirilmektedir. Abducens sinir felci çoğunlukla mikrovasküler periferik sinir hasarından kaynaklanır ve zamanla kendiliğinden düzelir. Diabetes mellitus (DM), mikrovasküler iskemik 6. sinir felci için en yaygın risk faktörlerinden biridir. COVID-19 ve diyabetin varlığı, daha yüksek tromboembolik olay riski ile ilişkili olabilir. Diyabete bağlı herhangi bir komplikasyonu olmayan bir DM hastasında koronavirüs hastalığı (COVID-19) sonrası gelişen abducens sinir felcini sunuyoruz.

Anahtar Kelimeler: COVID-19, diabetes mellitus, sinir felci

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INTRODUCTION

Sars-Cov-2 infection, which mostly affects the respiratory tract, can potentially induce neurological complications. It is one among the virus's neurological symptoms, along with anosmia, agusia, headache, dizziness, and decreased awareness. In addition, cranial nerve palsy, occlusive vascular diseases and Miller Fisher Syndrome characterized by the acute onset

of external ophthalmoplegia, ataxia, loss of tendon reflexes are increasingly reported (1-3). Multiple skleroz, tumors, vasculopathies and inflammatory diseases are among the causes of abducens nerve palsy. (4). Microvascular ischemia is an important cause of ocular motor neuropathies. Diabetes mellitus (DM) is also a common cause of microvascular ischemia (5).

We present the abducens nerve palsy that developed after coronavirus disease (COVID-19) in a DM patient without any other diabetes-related complications.

CASE



Figure 1. Limitation of outward gaze was observed in the left eye on motility examination

A 55-year-old female patient presented with the complaint of diplopia. The patient who presented with anosmia, fatigue and respiratory symptoms 15 days ago had a positive nasal swab for Sars-cov-2 polymerase chain reaction. The patient used oral favipiravir for 5 days. Diplopia presented one week after the patient's respiratory symptoms had improved. In his ophthalmologic examination, best corrected vision was 10/10 in both eyes, and the intraocular pressure was 14

mmHg on the right and 16 mmHg on the left. There was no afferent pupillary defect. Anterior segment and fundus were normal in the examination with slit lamp. Eye movements were evaluated. There was limited outward gaze in the left eye (Figure 1). Left abducens palsy was considered. Neurological examination was normal. He had diabetes mellitus for 20 years and was using 1 g metformin and insulin aspart subcutaneously. However, no signs of diabetic retinopathy were found in fundus examination. He had no other additional disease. Blood pressure and hemodynamic values were within normal limits (Bp = 120/80 mmHg, heart rate = 72 ppm, SpO2 = 98%, respiratory rate = 20 bpm). Complete blood count was within normal limits. Sedimentation was 38, HbA1c was 11.4, fasting blood sugar was 240. Magnetic resonance angiography (MRA) and magnetic resonance imaging (MRI) revealed no abnormalities (Figure 2).



Figure 2. Cranial magnetic resonance imaging (A) and magnetic resonance angiography (B) image is normal
Monocular occlusion was recommended to the patient to alleviate diplopia and follow-up was

planned. After 3 months, diplopia and limitation of gaze were completely resolved. Written informed consent for the images and patient information were obtained from the patient herself for publication

DISCUSSION

Abducens nerve palsy is an important cause of diplopia and is the most common isolated ocular nerve palsy. Trauma, vascular disease, tumor, aneurysm, infection, and inflammatory illnesses can all be the cause of abducens nerve palsy. The incidence of abducens nerve palsy is thought to rise with age, according to recent data from a country's insurance database, and its causes are primarily thought to be vascular (56.6%), idiopathic (27.2%), neoplastic (5.6%) or traumatic (4.9%). It is known that it is frequently caused by microvascular diseases. Diabetes is the most common disease among these diseases. In addition, thromboembolic events have been associated with COVID-19 infection. COVID-19 causes microvascular ischemia by causing vascular thrombus. In the early stages of infection with COVID-19, fibrinogen and D-dimer/fibrin(ogen) degradation products are markedly elevated. This is linked to frequent venous thromboembolic episodes and systemic hypercoagulability (10). The coexistence of COVID-19 and diabetes appears with an increased incidence of thromboembolic events. We present a case of abducens nerve palsy in a

55-year-old diabetic patient who recently had COVID-19.

COVID-19 can progress with neuroophthalmological findings by causing central nervous system involvement along with respiratory tract involvement. Systemic problems such as post viral inflammatory syndrome, cardiovascular disease, and uncontrolled hypertension are involved in the pathogenesis of neuroophthalmological symptoms. Hematological spread and viral invasion can also lead to neuroophthalmologic symptoms. Abducens palsy, oculomotor nerve palsy, Miller-Fisher Syndrome are previously reported cases (1,2,4,6)

Microvascular peripheral nerve injury is the most common cause of abducens nerve palsy, which recovers spontaneously over time. The most common risk factors for microvascular ischemic 6th nerve palsy are diabetes and arterial hypertension. Other risk factors have also been identified, including hyperlipidemia, coronary artery disease, and left ventricular hypertrophy (5). The most significant risk factor in our case was uncontrolled diabetes. The HbA1c level was 11.4%, but no evidence of end-organ damage was found.

In a study including 66 patients who developed cranial neuropathy, microvascular ischemic etiology was revealed in 57 patients. Microvascular ischemic ophthalmoplegia is characterized by sudden onset, transient pain and

absence of other neurological findings (7). Similar findings were also present in this case. In our case, complete blood count and sedimentation were performed to exclude temporal arteritis. Complete blood count was normal. The sedimentation height was thought to be related to COVID-19.

Sars-cov-2 infection can cause neuroophthalmologic symptoms ranging from gaze palsy to severe vision loss and cerebrovascular attacks. Visual loss due to central retinal artery occlusion and occipital infarcts have been reported (6). Brouwer et al. reported the possible etiology of stroke in COVID-19. They suggested that a coagulation system activation, embolism and inflammatory response occurs that can lead to cerebral infarction (8). In our case, imaging methods were used to determine the etiology. Cranial magnetic resonance imaging (MRI) was normal, ruling out other causes. In similar case reports, it has been shown that MRI may be normal in isolated 6th nerve palsy with vascular risk factors (9).

CONCLUSION

In the presence of risk factors such as diabetes, Sars-cov-2 infection can lead to ischemic cranial neuropathies. The abducens nerve palsy following COVID-19 in a diabetic patient without diabetic retinopathy or end organ damage was presented in this research. Although Sars-cov-2 infection is a significant risk factor for microvascular ischemia consequences on its own,

when combined with other risk factors, it can lead to more serious clinical difficulties.

Ethics Committee Approval: The consent form was filled out in participant.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept: HBK, Design: HBK, BE, Literature search: HBK, Data Collection and Processing: HBK, Analysis or Interpretation: HBK, BE Written by: HBK

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