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CASE REPORT

Contrast-induced encephalopathy after percutaneous peripheral intervention

Perkütan perifer girişimi sonrası gelişen, kontrast maddenin tetiklediği ensefalopati

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Summary– Contrast-induced encephalopathy (CIE) is a rare complication of angiography. Presently reported is the case of a patient diagnosed with CIE following peripheral angioplasty with the non-ionic contrast agent, iohexol. A 66-year-old male patient described intermittent claudication and peripheral arterial disease was suspected. Lower extremity angiography was performed, and following dilation of a 7.0x150-mm balloon, a 9.0x57-mm stent was placed in the lesioned vessel. The patient subsequently developed confusion and cortical blindness, and a seizure occurred 1 hour after the procedure. An emergency cerebral computed tomography scan did not reveal any signs of intracerebral hemorrhage. The neurological symptoms disappeared within 24 hours after hydration and sedative medication. CIE was diagnosed based on the patient`s clinical course findings and cerebral imaging.

Özet– Kontrast maddenin tetiklediği ensefalopati, anjiyografi sonrası gelişen nadir bir komplikasyondur. Bu olgu sunumunda, periferik anjiyoplasti sonrası non-iyonik kontrast madde olan iohexole bağlı olarak gelişen kontrast maddenin tetiklediği ensefalopati olgusu sunuldu. Altmış altı yaşında erkek hasta aralıklı topallama şikayetiyle başvurdu ve perifer arter hastalığı düşünüldü. Ardından alt ekstremite anjiyografisine alındı ve anjiyografi sonrası 7.0x150 mm balon ile genişletme, ardından 9.0x57 mm stent yerleştirildi. İşlemden yaklaşık bir saat sonra hastada konfüzyon, kortikal körlük ve ardından konvülsiyon gelişti. Acil serebral bilgisayarlı tomografide intraserebral kanama lehine bulgu saptanmadı. Hidrasyon ve sedatif tedavi ile 24 saat sonra hastanın nörolojik semptomları tamamen kayboldu. Hastanın klinik bulguları ve serebral görüntülemeleri doğrultusunda kontrast maddenin tetiklediği ensefalopati tanısı konuldu.

Contrast-induced encephalopathy (CIE) is a rare complication of angiography. This phenomenon was first described in 1970 as transient cortical blindness after coronary angiography.[1] Clinical manifestations include encephalopathy, seizures, corti¬cal blindness, and focal neurological def¬icits, such as ophthalmoplegia.[2] The incidence of CIE ranges between 0.3% and 1.0%, although it can reach 4% when hyperosmolar iodinated contrast agents are used.[3] Herein, a case of CIE following peripheral angioplasty with a non-ionic contrast agent, iohexol, is described.

Abbreviations:

CT	*Computed tomography*
CIE	*Contrast-induced encephalopathy*

CASE REPORT

A 66-year-old male patient was admitted to the clinic with the complaint of pain in the right lower extremity after walking approximately 40 to 50 meters. His discomfort was relieved with 5 minutes of rest. His medical history was unremarkable, with the exception of 50 pack years of smoking. He described intermittent claudication, which suggested the suspicion of peripheral arterial disease. Lower extremity angiography revealed that he had 100% obstruction in the proximal portion of the right common iliac artery (Fig. 1a). After treatment with acetylsalicylic acid and clopidogrel, a 9.0x57-mm stent was inserted in the vessel with the lesion after dilation of a 7.0x150-mm balloon (Fig. 1b and c) using a bidirectional approach via the right

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brachial and right femoral arteries. A total of 75 U/kg unfractionated heparin was administered during the procedure, and angioplasty was performed using 250 mL of iohexol. The patient soon developed confusion and cortical blindness, followed by a seizure 1 hour after the procedure. An emergency cerebral computed tomography (CT) scan did not reveal any signs of intracerebral hemorrhage (Fig. 1d). A carotid and vertebral CT scan was performed, which showed no ischemic lesion (Fig. 1e). The neurological symptoms resolved within 24 hours after hydration and sedative medication. A cerebral CT taken after 48 hours indicated normal findings (Fig. 1f). CIE was diagnosed based on the patient's clinical findings and cerebral imaging.

DISCUSSION

CIE is a very rare complication of diagnostic an¬giography and percutaneous interventions.[4] It is most commonly seen after cerebral angiography, though it has also been described after contrast-enhanced CT, as well as cardiac or peripheral angiography.[5,6] Clinical manifestations include encephalopathy, seizures, cortical blindness, and focal neurological deficits.[2] The patient's neurological status usually develops within hours of exposure to the contrast medium. Spontaneous resolution of neurological status usually occurs over a period of days.[7]

In the literature, many kinds of contrast media, including ionic, non-ionic, hyperosmolar, and isosmolar agents, have been reported to induce CIE.[8,9] The incidence of CIE ranges between 0.3% and 1.0%, although it can reach 4% when hyperosmolar iodinated contrast agents are used.[3] The mechanism is not exactly clear, but one possible reason for this complication is a disruption of the blood-brain barrier.[2] The cause of the blood-brain barrier disruption is variably attributed to the hyperosmolality and chemotoxicity of contrast media.[10] The occipital cortex is one of the regions with higher permeability of the blood-brain

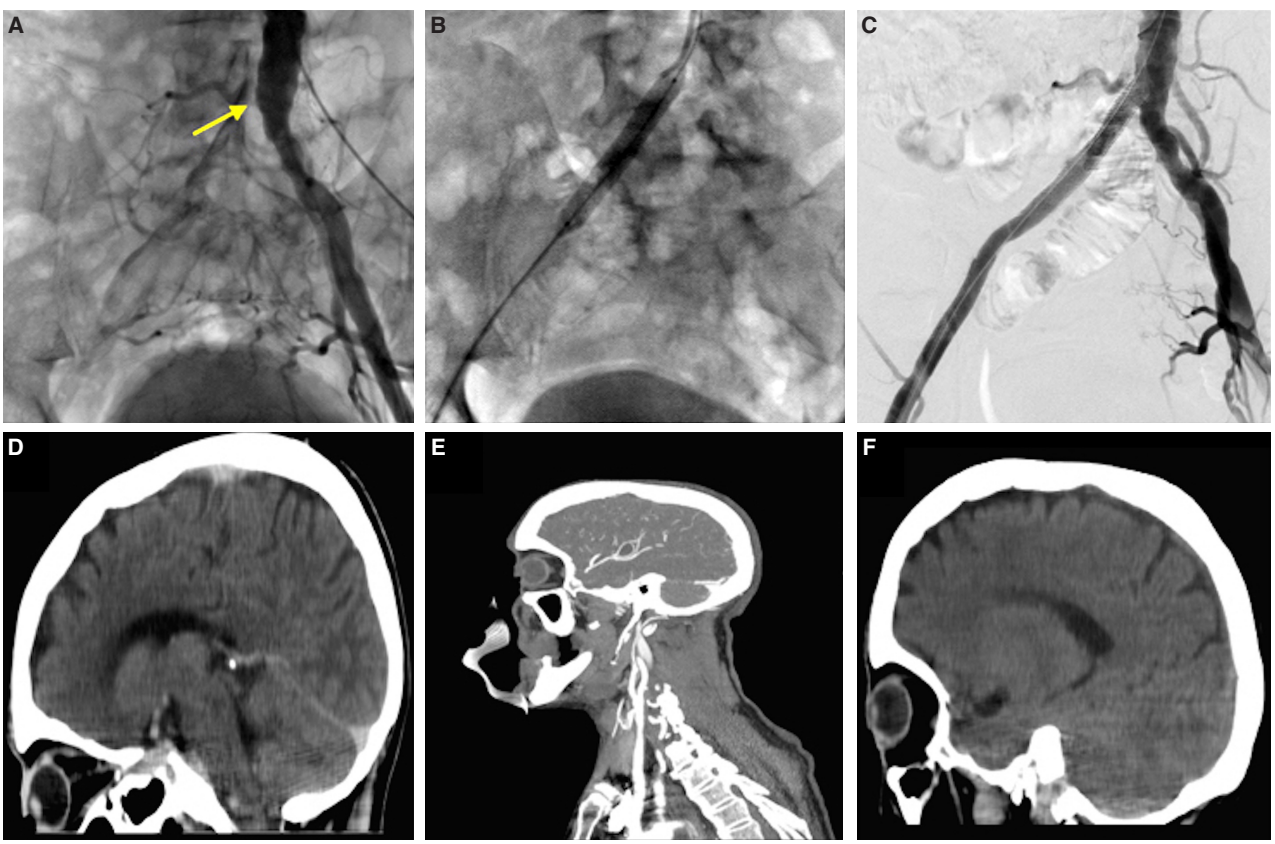

Figure 1. **(A)** Lower extremity angiography showed total occlusion in the proximal portion of the right common iliac artery. **(B, C)** A 9.0x57-mm stent was inserted in the vessel with the lesion following dilation of a 7.0x150 mm balloon. **(D)** Cerebral computed tomography scan revealed no sign of intracerebral hemorrhage. **(E)** Carotid and vertebral computed tomography showed no ischemic lesion. **(F)** Cerebral computed tomography image taken after 48 hours indicated normal findings.

barrier. This explains the more frequent occurrence of neurological deficits, such as cortical blindness and ophthalmoplegia. The predisposing factors include chronic hypertension,[3] transient ischemia attack,[11] impaired cerebral autoregulation,[11] large contrast volume,[11] impaired renal function,[12] male gender,[12] and selective vertebrobasilar arteriography.[13]

Due to similar clinical presentations, it is important to distinguish angiography from thromboembolic and hemorrhagic complications. Imaging is important in confirming the diagnosis and excluding thromboembolic and hemorrhagic complications.[10] A brain CT without contrast, and magnetic resonance imaging values, such as the apparent diffusion coefficient, can differentiate CIE from cerebral ischemia and subarachnoid hemorrhage.[14,15] The correct diagnosis of CIE allows us to avoid the risks associated with erroneous treatment, such as thrombolytic agents for acute cerebrovascular ischemia or surgery for subarachnoid hemorrhage.

Although there is no specific treatment for this condition, hydration and close observation of the patient in the immediate postprocedural period are recommended.[16] Symptomatic treatments, such as anticonvulsant therapy for seizures, are usually sufficient. In a few cases, patients have been treated with steroids and mannitol with no adverse consequences.[2]

In conclusion, contrast-induced encephalopathy is a very rare complication of diagnostic an-giography and percutaneous intervention. Physicians should be aware of this phenomenon and keep it in mind in the differential diagnosis.

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Anahtar sözcükler: Kontrast madde; ensefalopati; periferal girişim.