Folia Cardiologica 2020
tom 15, nr 6, strony 437–440
DOI: 10.5603/FC.2020.0066

ISSN 2353–7752

Unilateral palsy of the oculomotor nerve accompanied by acute ischemic stroke after coronary angiography

Jednostronne porażenie nerwu okoruchowego z towarzyszącym ostrym udarem niedokrwiennym po zabiegu koronarografii

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Abstract

The paper presents a description of a 75-year-old female patient with arterial hypertension, diabetes mellitus 2, connective tissue disease admitted to the Department of Cardiology due to unstable angina. Immediately after coronary angiography, the patient developed nystagmus, and double vision of the left eye — paralysis of the lower branch of the left oculomotor nerve was diagnosed. Despite the commonness of coronary angiography procedures performed in the world, eye complications are rarely reported.

Key words: coronary angiography, oculomotor nerve palsy, ischemic stroke

Folia Cardiologica 2020; 15, 6: 437–440

Introduction

The oculomotor nerve is the third cranial nerve that innervates the oculomotor muscles: the rectus muscles (medial, upper and inferior), the inferior oblique muscle and the levator palpebrae superioris. In addition, this nerve contains parasympathetic fibres innervating the intraocular muscles: the pupil sphincter and the ciliary muscle. Symptoms of isolated palsy of the oculomotor nerve are characteristic, and usually, the initial diagnosis is based on a basic physical examination. Symptoms include diplopia, divergent strabismus, drooping upper eyelid, reduced adduction, poor accommodation, and dilated pupils. Nerve damage can affect all the muscles innervated by the nerve (total paralysis), or only the muscles that move the eyeball (external paralysis) or only the intraocular muscles (internal paralysis). The cause of the damage to the oculomotor nerve may be the pressure on the nerve fibres caused by, *e.g.*, by neoplasms or aneurysms, or the damage may be ischemic, caused by vascular changes in the course of hypertension or diabetes. However, the aetiology of paralysis of the oculomotor nerve following coronary angiography is not fully elucidated [1, 2].

Case report

A 75-year-old patient was admitted to the Department of Cardiology on an emergency basis due to symptoms of angina that had been present for about 6 weeks. The patient has been treated so far for arterial hypertension,

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diabetes mellitus type 2 (with sulfonylurea derivatives), rheumatoid arthritis, and hypothyroidism. Additionally, the patient had interstitial lung lesions found in the Pulmonology Department in the course of connective tissue disease. In biochemical tests, markers of myocardial ischemia remained at a stable level upon admission to the Clinic. There were no changes in the ST-T segment in the electro-cardiographic record. Echocardiography was performed, showing normal left ventricular systolic function with an ejection fraction (LVEF) of 64% and basal inferior wall hypokinesis. Due to the reported complaints and the overall clinical picture, unstable angina was diagnosed, and the patient was qualified for invasive diagnostics of the coronary arteries. The coronary angiography revealed multivessel coronary disease with involvement of the left coronary artery trunk. In the periprocedural period, the patient developed a double vision of the left eye, headache, and symptoms of oculomotor nerve palsy. Computed tomography (CT) of the head was performed urgently, with no significant abnormalities. The patient was consulted neurologically and ophthalmologically — an magnetic resonance imaging (MRI) of the head was recommended (Figure 1). On the basis of additional tests, an ischemic stroke was diagnosed. The patient was consulted as part of the cardio group — the patient was qualified for coronary artery bypass surgery after the end of the acute phase of the stroke. Additionally, the patient underwent Doppler ultrasound of the carotid arteries and CT of the head and neck arteries — a circular calcified plaque in the bulb was visualized in the left internal carotid artery, narrowing the vessel lumen by 53% by diameter and by 78% by the surface area (Figure 2). The vascular surgeon, based on the imaging of the carotid arteries and the magnetic resonance image of the head, qualified the patient for intra-vascular surgery — carotid artery stenting (CAS). The patient was discharged from the Department of Cardiology with the recommendation of further treatment at the Department of Vascular Surgery and a follow-up at the Cardiac Surgery

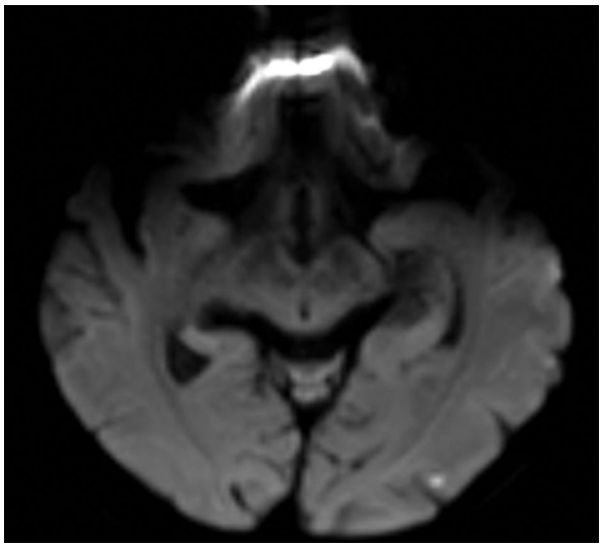

Figure 1. Magnetic resonance imaging of the head — in the left occipital lobe point areas of increased signal, corresponding to small, fresh ischemic changes

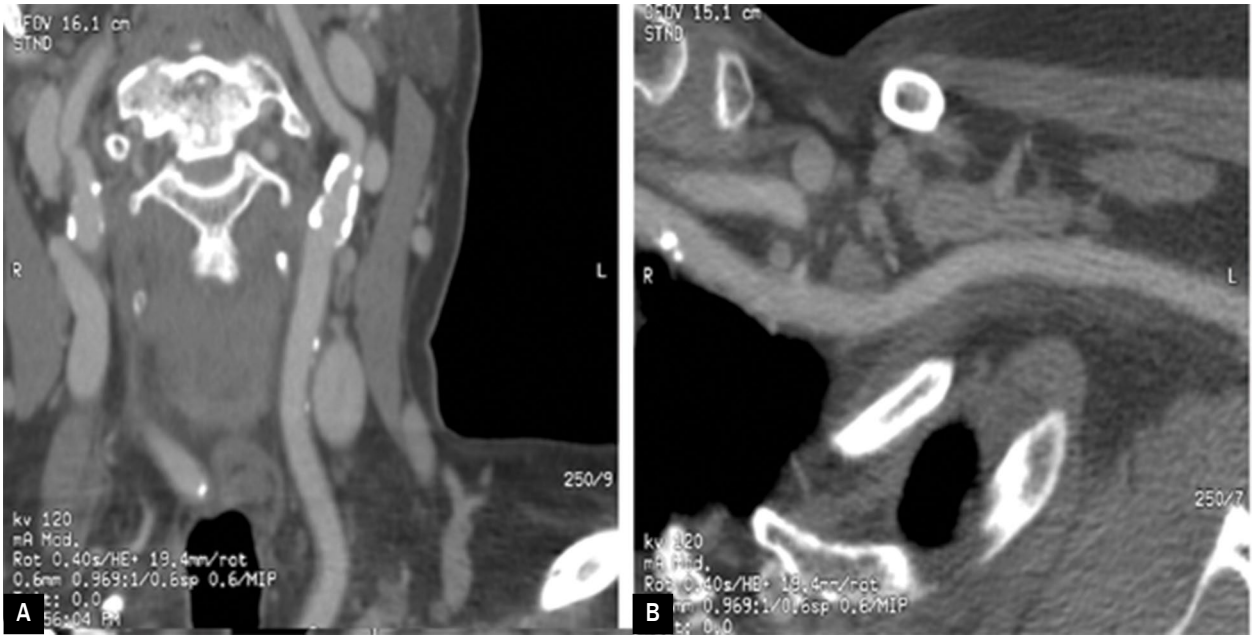

Figure 2A, B. Computed tomography of the arteries of the head and neck — in the left internal carotid artery circular calcified plaque in the bulb

Clinic for final qualification and setting the date of coronary artery bypass surgery.

Follow-up

Two months after coronary angiography, the patient underwent coronary bypass surgery and left carotid stenting, and then the patient began cardiac rehabilitation. The symptoms of palsy of the oculomotor nerve disappeared completely. The patient reported feeling very well and denied angina symptoms. Rehabilitation helped a patient to return to physical as before the surgery. The patient was recommended for further follow-up at the Cardiac, Cardiosurgical and Vascular Surgery Clinics.

Discussion

Coronary angiography, thanks to the continuous improvement of the, has become an effective and safe procedure, but just like any invasive examination, it is associated with the possibility of complications [3, 4]. In relation to the conducted studies, the incidence of complications after coronary angiography is estimated at about 1.8% of procedures performed, and among them, the most common are local complications related to puncture of the artery [5]. Ocular complications after coronary angiography are very rarely described in the literature. Drummond et al. [6] described the case of a 61-year-old woman who developed diplopia during percutaneous coronary angioplasty. The diagnosis was partial paralysis of the third cranial nerve, and symptoms partially resolved within 7 months.

Damage to the vessels supplying this nerve may be a probable cause of paralysis of the oculomotor nerve during coronary surgery. Firstly, vessel occlusion during coronary angiography may be the result of microclotting on the guides used during the procedure. Secondly, atherosclerotic plaques, present in other vascular beds, can be activated during catheterization and cause cholesterol microembolisms [7–9]. Ocular complications in the course of carotid artery diseases are quite well known and are attributed to thromboembolic aetiology [10]. Oculomotor nerve palsy may be an early sign of critical hypoperfusion in the internal carotid artery and should be an urgent indication for imaging diagnostics of the carotid arteries. In the discussed case, the patient underwent Doppler ultrasound of the carotid arteries and CT of the head and neck arteries, revealing a circular calcified plaque in the left internal carotid artery, narrowing the vessel lumen by 53% by diameter and by 78% by surface area, which is probably the cause of ischemic stroke. A vascular surgeon, based on the examination of the carotid arteries and the magnetic resonance imaging of the head, qualified the patient for the procedure of internal carotid artery angioplasty.

Conclusions

Ocular complications after coronary angiography, including oculomotor nerve palsy, are extremely rare, and their possible aetiology can only be inferred from the publication of a few medical cases. However, it should be remembered that the cause of such complications may be the advanced atherosclerosis of the vascular bed, which probably also applied to our patient. Diffuse atherosclerosis requires in-depth diagnostics and appropriate therapy.

Conflict of interest

The authors declare no conflict of interest.

Streszczenie

Przedstawiono opis 75-letniej pacjentki, z nadciśnieniem tętniczym, cukrzycą typu 2, chorobą tkanki łącznej, przyjętej do kliniki kardiologii z powodu niestabilnej dławicy piersiowej. Bezpośrednio po zabiegu koronarografii u chorej wystąpił oczopląs oraz podwójne widzenie lewego oka — rozpoznano porażenie gałęzi dolnej lewego nerwu okoruchowego. Mimo powszechności zabiegów koronarografii wykonywanych na świecie rzadko zgłaszane są powikłania oczne.

Słowa kluczowe: koronarografia, porażenie nerwu okoruchowego, udar niedokrwienny

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