Branch Retinal Artery Occlusion after Diagnostic Cardiac Catheterization

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SUMMARY

A case of right branch retinal artery occlusion (BRAO) due to cholesterol-containing embolus following transfemoral cardiac catheterization is reported. It is extremely rare, however, cardiologists should be alert to any thromboembolic complications during and following cardiac catheterization and choose the suitable approach (either upper extremity or transfemoral). (Jpn Heart J 2002; 43: 193-196)

Key words: Branch retinal artery occlusion, Cardiac catheterization

DIAGNOSTIC coronary catheterization may result in complications, such as neurologic events (stroke, transient ischemic attack, 0.1%), arrhythmias (0.3%), local vascular problems (1.6%), vasovagal reactions (2.1%), and allergy (0.1~2%).1) The incidence of systemic cholesterol emboli after a percutaneous transluminal coronary angioplasty was reported to be 1.4-3%.2) However, ocular complications are extremely rare after simple diagnostic cardiac catheterization. We report a case of branch retinal artery occlusion following transfemoral cardiac catheterization.

CASE REPORT

A 79-year-old Taiwanese female was admitted because of a sudden onset of chest tightness, which was responsive to sublingual nitroglycerin. She had hypertension for more than 10 years with regular treatment. She had no history of diabetes mellitus, hyperlipidemia, or smoking. Echocardiography revealed a calcified aortic valve and normal left ventricular function. No obvious intracardiac vegetation or thrombus was seen. TI-201 stress/redistribution myocardial perfusion single photon emission computed tomography revealed possible mild...
myocardial ischemia in the anterolateral region. Coronary catheterization was conducted on February 20, 2000, and revealed no significant stenosis in the coronary arteries. We used a left 6 French and a right 6 French Judkin diagnostic coronary catheter, a 6 French pigtail catheter, and a 0.035 inch J-tip guidewire. No heparin bolus injection was given, and only heparinized saline (3 IU/mL) was used to flush the sheath and catheter. The whole procedure was smooth and the guidewire was not inserted into the carotid artery during manipulation and only took 20 minutes. Unfortunately, the patient noted the sudden onset of a lower visual field defect in her right eye about 20 hours after catheterization. Supportive treatment was recommended. Fundus fluorescein angiography revealed right BRAO along with a yellowish white material indicating a cholesterol embolus. There was a white swelling that appeared in the upper retinal section indicating ischemia (Figure 1). Carotid duplex examination showed mild to moderate atherosclerotic changes in the bilateral carotid system without significant stenosis. The follow-up fundus photography five months later revealed that the branch retinal artery was blunted and the cholesterol embolus was still present, but ischemia in the upper retinal section had improved, which may be due to the

Figure 1. Fundus photography with fluorescein angiography. Note white swelling located in upper retinal section (yellow arrow), indicating ischemia and one yellow-white cholesterol embolus (arrow head) in the branch retinal artery (red arrow).
development of collateral circulation (Figure 2). No skin, vascular, renal, or other alterations have been substantiated during the in-hospital period and at the 5-month clinical follow-up, but a residual visual defect of the affected eye persisted.

**DISCUSSION**

A 79-year-old female who developed BRAO due to a cholesterol embolism following diagnostic cardiac catheterization was reported. Central retinal artery and cilioretinal artery occlusion following diagnostic cardiac catheterization have been reported. But only four patients with BRAO after directional coronary atherectomy and percutaneous coronary angioplasty have been reported.

Cholesterol embolism is a rare, severe complication of cardiac catheterization. It is produced when cholesterol crystals from an ulcerated, disrupted atheromatous plaque, frequently localized in the internal carotid artery or near the origin of the aorta, are released in the arterial bloodstream and often result in multiorgan systemic failure symptoms characterized by skin lesions, lower-extremity ischemia, renal insufficiency, arterial hypertension, gastrointestinal
bleeding and retinal embolism, among others. In our case, she only had a visual problem without other systemic adverse effects. Arterial procedures (surgery and cardiac catheterization) as well as pharmacologic treatment with an anticoagulant, such as warfarin or heparin, and fibrinolytic agents have been described as the precipitating factors, because they may prevent the formation of thrombi over ulcerated atheromatous plaques, allowing exposed cholesterol crystals to be scraped into the circulation. Once a cholesterol embolism has been established, no effective specific treatment exists other than endarterectomy of the atherosclerotic carotid artery, if such a defect exists, to prevent recurrent embolic processes.

Patients who require catheterization but have noninvasive evidence of atherosclerotic aortic debris most likely should undergo an upper extremity approach, to reduce the likelihood of cholesterol embolization. In high-risk patients, such as the elderly, noninvasive procedures (transesophageal echocardiography, magnetic resonance imaging, computed tomography, etc.) should be recommended to screen for the presence of atherosclerotic debris from the aorta.

In conclusion, cardiologists should be alert to any thromboembolic complications (eg., visual disturbance) during and following cardiac catheterization and choose a suitable approach (either upper extremity or transfemoral).

REFERENCES