CLINICAL VIGNETTE

Transient Internuclear Ophthalmoplegia Following Cardiac Catheterization

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Case Report

A 57-year-old woman presented to the Emergency Room with worsening anginal symptoms despite medical therapy. The patient has known diabetes, hypertension, and dyslipidemia. Non-invasive cardiac stress testing showed a large area of stress-induced ischemia in the distribution of left-anterior descending (LAD) artery. Cardiac catheterization using the femoral artery for arterial access revealed 80% stenosis in the proximal LAD. Percutaneous coronary intervention was successful using a drug-eluding stent. In the recovery area, the patient reported diplopia, especially with leftward gaze. There were no other neurologic findings: no focal weakness, focal numbness, dysphagia, dysarthria, aphasia, or ataxia. Neuro-ophthalmologic examination revealed internuclear ophthalmoplegia on the right. Radiographic imaging with CT and MRI were unremarkable. The patient remained on dual antiplatelet agents with Aspirin and Plavix. Given diplopia, an eye patch was applied. In her follow-up appointment, the patient denied recurrent angina symptoms, and her diplopia had resolved.

Discussion

Cardiac catheterization is a common invasive procedure in the United States. Though it is relatively safe, this procedure does not come without risks. The most serious of these are myocardial infarction (0.05%), stroke (0.07%), and death (0.08%-1.4%).[1] Neurologic complications may occur, including global ischemia, focal ischemic neurologic deficits, and/or infarctions in the hemispheric, occipital, or brainstem regions.[2] Neuro-ocular complications are rare, and isolated internuclear ophthalmoplegia (INO) has been described.

Internuclear ophthalmoplegia is the result of damage to the medial longitudinal fasciculus (MLF) in which contralateral adduction of the eye is impaired with lateral gaze. Clinically, INO may manifest anywhere from a slowing of saccades and transient diplopia to complete loss of adduction and constant diplopia with horizontal eye movement. Nystagmus of the abducting eye and preserved convergence are other common clinical findings in INO. Several case reports have described patients reporting diplopia shortly following cardiac catheterization or other endovascular therapies.[2,3] Though cases of isolated internuclear ophthalmoplegia appear to be quite rare (1/1,000- 1/6,465 procedures), it may be under-recognized due to spontaneous recovery or association with more widespread neurological deficits.[2]

INO following cardiac procedure is thought to be due to ischemia secondary to microembolization (emboli <25um). Clinical symptoms may involve the posterior circulation with femoral, radial, or antecubital approaches.[2,4] The MLF receives its vascular supply from the perforating arteries originating from the superior 1cm of the basilar artery.[2,5] These small end-arteries give rise to the anatomic vulnerability of the MLF to microemboli. Neuroimaging may fail to reveal a lesion due to the limited extent of the infarction in these cases.

Skew deviation is a similar ophthalmic complication of cardiac catheterization that occurs due to ischemic damage to the MLF. In this instance, there is an imbalance of input from the vestibular system to the oculomotor system, resulting in vertical misalignment of the eyes and thus vertical diplopia. When this imbalance is due to damage of the MLF, an INO with skew deviation (most commonly ipsilateral hypertropia) can result.

Patients with INO or skew deviation following cardiac procedures often recover well. Eggenberger et al[2] found all of their patients to be asymptomatic in the primary position after a mean of 82 days. This trend of spontaneous recovery appears to be relatively common.[2,3,4]

In conclusion, internuclear ophthalmoplegia is a rare complication of cardiac catheterization. These symptoms are thought to be caused by ischemia of the medial longitudinal fasciculus following microembolization as a result of the procedure. As of yet, there are no apparent patterns in the type of cardiac procedure or the emergent circumstances under which it was performed.[2] The prognosis of these patients is very good, as most are asymptomatic in a matter of months.

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