Case Report

Acute Ischemic Stroke with Multiple Infarctions in the Posterior Circulation Complicating Diagnostic Coronary Angiography in an Octogenarian: A Case Report

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1. Introduction

Acute stroke complicating cardiac catheterization is rare, but when it occurs, it has a high rate of morbidity and mortality. According to the New York State Angioplasty Registry, of 76,903 patients who underwent angioplasty, 140 (0.18%) had a stroke. The etiologies and locations were not specified. In a smaller study, 79 of 20,679 patients (0.25% of procedures) sustained a stroke after percutaneous coronary intervention. Most cases involved one of the cerebral arteries, with only 7% involving the basilar artery. We report an octogenarian with an acute basilar artery stroke complicating diagnostic coronary angiography. We believe this particular complication in such an elderly patient has not previously been reported.

2. Case report

An 82-year-old woman was admitted complaining of exertional chest tightness. She had a several-year history of hypertension, diabetes, and hyperlipidemia, all of which were managed elsewhere. She had undergone coronary angioplasty with stenting several times, most recently 2 years previously. The patient had seen neurologists for many years because of frequent complaints of dizziness, but she had never had an investigation of her cerebral vessels, had never had a stroke, and was neurologically intact.

On the day of admission, the blood pressure was 130/62 mmHg and the pulse 73 beats/min. Physical examination showed unremarkable results. Cardiac catheterization was performed the following day. Just before the procedure in the catheterization laboratory, she was slightly anxious and the blood pressure was slightly elevated, but she was talking normally. The catheter was introduced through the right femoral artery, and left coronary angiography was performed. The patient was appropriately responsive during the procedure. However, just after it was completed, she became unresponsive. The systolic blood pressure was over 180 mmHg. Both pupils were dilated and unresponsive to light, and doll’s eye movements were absent. Emergency computed tomography showed no intracranial hemorrhage. Magnetic resonance imaging performed the following day revealed an acute infarction of the left thalamus, mid-brain, and cerebellum. Computed tomographic angiography showed total occlusion of the tip of the basilar artery. Multiple infarctions secondary to occlusion of the basilar artery tip as a complication of coronary angiography has not been reported in an octogenarian.
The patient remained unresponsive, although spontaneous limb movements were observed. Computed tomographic angiography performed on the sixth hospital day showed total occlusion of the tip (bifurcation) of the basilar artery (Fig. 2).

On the ninth day, the patient’s family transferred her to another hospital nearer their home.

3. Discussion

This patient sustained multiple infarctions in the posterior cerebral circulation during diagnostic coronary angiography. The arteries involved were downstream vessels of the vertebral artery, including branches of the basilar artery, the posterior cerebral artery, and superior and inferior cerebellar arteries. When the catheter is introduced through the femoral artery, it sometimes floats into the subclavian artery. We postulate that the patient had a thrombus or, perhaps more likely, a plaque at the orifice of the left vertebral artery that was dislodged by the catheter, resulting in a shower of atheroembolic material leading to multiple infarctions.

Risk factors for stroke during cardiac catheterization include age >70 years, diabetes mellitus, hypertension, hypercholesterolemia, prior stroke, and renal failure2,3. It is also more likely if the procedure is quite long or with use of large volumes of contrast medium. This patient had a number of the risk factors, although the procedure itself was relatively short.

Because stroke complicating cardiac catheterization is rare, optimal treatment is not clearly defined4,5. It would not be feasible to perform large-scale, controlled studies. There is no documented way to prevent such a complication. Expert opinion suggests that local thrombolyis may be the treatment of choice. De Marco et al6 recommended immediate cerebral angiography with local thrombolyis rather than delaying treatment to perform imaging. They had a better outcome in six patients with immediate treatment than in two who first underwent imaging. Of the six patients, five had occlusion of a cerebral artery and one had vertebral artery dissection secondary to catheter trauma.

Bridging therapy with intravenous abciximab given shortly before intra-arterial recombinant tissue-type plasminogen activator (rt-PA) was compared with thrombolysis alone in 75 patients treated a median of 5 hours (range 2–24 hours) after presenting with acute basilar artery occlusion. The bridging therapy appeared to be safe and yielded higher recanalization rates than treatment with intra-arterial rt-PA alone2. Abciximab may facilitate endogenous thrombolysis by reducing thrombus growth by competitive inhibition with fibrinogen. Whether thrombolytic therapy is effective at all when the emboli causing the stroke may be from an atheromatous plaque dislodged during catheterization, however, is unclear. Such emboli consist mainly of lipid, calcium, smooth muscle, and other debris.

Given our patient’s age and brain stem involvement, thrombolytic therapy was not considered although there was no literature against it. The Canadian Activase for Stroke Effectiveness Study national registry6 collected data on treatment with intravenous tissue plasminogen activator for stroke. Among 242 octogenarians, 4% had intracerebral hemorrhage, 33% died within 90 days, and only 26% had a favorable functional outcome at 30 days.

4. Conclusion

To the best of our knowledge, this is the first reported case of acute stroke with multiple arterial occlusions in the posterior circulation complicating diagnostic coronary angiography in an octogenarian. While prompt diagnosis and immediate intra-arterial thrombolytic therapy are of benefit in spontaneous basilar artery occlusion, it is not clear if such treatment would benefit patients similar to ours.

References