Bilateral Ophthalmic Artery Dissecting Aneurysms Presenting with Recurrent Epistaxis

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Abstract
—We present a rare case of bilateral expanding traumatic pseudoaneurysms of the ophthalmic arteries, due to a gunshot. The aneurysms presented with epistaxis. After a failure of conservative management, coil embolization of the aneurysms resulted in complete occlusion, with preservation of flow in the parent vessels.

Keywords
aneurysm; pseudoaneurysm; dissecting; traumatic; bilateral; epistaxis; coil

Introduction
Traumatic aneurysms of cerebral arteries are uncommon and can result from penetrating missile injuries [1]. We report a case of bilateral ophthalmic artery pseudoaneurysms due to a gunshot to the temple in a middle-aged man. Successful endovascular embolization was performed for the bilateral ophthalmic artery pseudoaneurysms. This is the first case of mirror ophthalmic artery pseudoaneurysms caused by a gunshot, presenting with epistaxis, and treated with coil embolization. In addition, the successful preservation of parent ophthalmic artery is an unusual feature of this case.

Case Report
The patient is a 47-year-old man admitted with gunshot wounds to the right temple as well as both thighs and the right forearm. The initial Glasgow Coma Scale was 3. Facial bone CT scan revealed multiple facial fractures, with a bullet fragment lodged in the left parietal occipital region. A CT angiogram was performed which revealed evidence for ophthalmic pseudoaneurysm with active contrast extravasation from both ophthalmic arteries into both orbital apices. During the course of the patient’s first hospital night, he experienced epistaxis and a drop in hemoglobin. He received nasal packing as well as transfusion. A catheter angiogram was performed on hospital day 8, revealing a 3.5-mm aneurysm involving the left ophthalmic artery (Figure 1). On the right, there was a 3.8-mm ophthalmic artery aneurysm (Figure 2). On hospital day 11, the patient began having recurrent epistaxis. The patient was taken back to the...
angiography suite for bilateral ophthalmic artery aneurysm embolization.

Procedural Detail

A 6 French sheath was placed in the right femoral artery and a 6 French MPC Envoy guide catheter was navigated into the aortic arch, followed by the left internal carotid artery. Cerebral angiography was performed that showed an enlarged pseudoaneurysm of the left ophthalmic artery (13 mm). Initially, vessel sacrifice with a liquid embolic was considered, and a Headway Duo (Microvention, Tustin, CA) microcatheter and Synchro 14 (Stryker, Fremont, CA) microwire were coaxially inserted and used to catheterize the left ophthalmic artery pseudoaneurysm (Figure 3). Coil embolization of the pseudoaneurysm, then, commenced and succeeded in occluding the aneurysm without the need for vessel sacrifice with a liquid embolic. The guide catheter was, then, returned to the arch and guided into the right internal carotid artery. Cerebral angiography was performed, showing expansion of the right ophthalmic pseudoaneurysm to 8 mm (Figure 4). The Headway Duo microcatheter and Synchro 14 microwire were coaxially inserted and used for embolization of the right ophthalmic artery pseudoaneurysm. This was completed successfully. The post-coiling angiography revealed that the ophthalmic arteries remained patent on both sides (Figures 5 and 6). The patient remained clinically stable post-embolization.

Discussion

Traumatic aneurysms of cerebral arteries are uncommon and are thought to represent 0.4%–1% of all cerebral aneurysms [1–3]. Aarabi et al. [4] reported that of 964 patients with penetrating intradural missile injuries, 18 (1.86%) had traumatic aneurysms. Our patient’s case is the second in the literature describing bilateral ophthalmic artery pseudoaneurysms after penetrating injury [5]. The prior case was discovered sub-acutely. Expansion of the aneurysms [6] and the presentation of epistaxis [7] have been reported, but the recurrent epistaxis from significant diameter expansion of bilateral aneurysms is not reported.

Anatomically, the aneurysms on both sides arose proximal to the “bend” of the ophthalmic artery. This bend represents the crossing of the optic nerve by the ophthalmic artery. It heralds the beginning of the third part of the artery, where the anterior and posterior ethmoidal arteries arise [8]. These arteries have been implicated in traumatic epistaxis, and could serve as a conduit for bleeding in our patient [9].

The decision to intervene in this case was felt to be urgent, given the expansion of the aneurysms as well as the failure of conservative treatment. Fatal epistaxis has been reported from a traumatic cerebral aneurysm [10]. The use of detachable coils in this condition has been
documented [2,3,6], as has the use of ethylene alcohol vinyl copolymer (Onyx) to treat anterior circulation traumatic pseudoaneurysms [11,12]. Our case demonstrates the feasibility of vessel preserving endovascular treatment of this condition.

References