

# A CASE OF OPHTHALMIC ANEURYSM CAUSED BY GUNSHOT INJURY

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## SUMMARY

*This article presents a case of ophthalmic artery aneurysm and briefly reviews the literature on the subject. A patient was admitted to our hospital with loss of vision due to a gunshot injury. A plain radiography revealed an arrow-shaped bullet in the skull. Cerebral angiography confirmed a diagnosis of ophthalmic artery aneurysm, and surgery revealed a false traumatic ophthalmic aneurysm.*

**Key Words:** Aneurysm, Ophthalmic Artery, Trauma

## ÖZET

### ATEŞLİ SİLAH YARALANMASININ NEDEN OLDUĞU OFTALMİK ARTER ANEVİZMA VAKASI

*Bu yazıda travma kaynaklı bir oftalmik anevrizma vakası sunulmuştur. Hasta kliniğimize ateşli silah yaralanmaya bağlı görme kaybı ile başvurmuştur. Direk kafa grafisinde sivri uçlu kurşun parçası görülmüştür. Yapılan serebral anjiyografi ile oftalmik arter anevrizması tanısı konulmuştur. Operasyon sırasında oftalmik arterde yalancı anevrizma ile karşılaşmıştır. Bu konudaki literatüre bilgileri kısaca tartışılmıştır.*

**Anahtar Kelimeler:** Anevrizma, Oftalmik Arter, Travma

Traumatic aneurysms are rare, representing only 0.04%-0.09% of all cerebral aneurysms. They usually involve either the peripheral cerebral arteries or the basal portion of the internal carotid artery. Several theories have been proposed to explain the pathogenesis of traumatic aneurysms.(1, 2) Digital subtraction angiography provides the standard for diagnosing traumatic aneurysms, and the primary treatment is surgical. The purpose of this study is to add to the literature a case of traumatic ophthalmic aneurysm and to briefly discuss the pathogenesis, possibilities

of early diagnosis and treatment modalities available for traumatic ophthalmic aneurysms.

## Case Report

A previously healthy 19-year-old male presented with loss of vision in the left eye. One week before admission, he had received a gunshot injury to the left eye inflicted by a toy rifle at a shooting gallery, after which he developed a progressive loss of left-eye vision. Physical examination revealed exophthalmus and chemosis of the left eye. A neurological examination revealed

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visual acuity at the level of perception and projection only. Plain skull radiographs revealed an arrow-shaped bullet in the skull. Because of the possibility of aneurysm, a digital subtraction angiography was performed, after which an aneurysm in the orbital part of the ophthalmic artery was diagnosed. (Fig1) Following diagnosis, the patient was prepared for surgery, and a left frontal craniotomy and orbital unroofing was performed. The optic canal was drilled, and the optic nerve and ophthalmic artery were identified in the orbita. The ophthalmic artery was followed distally in the orbita, and an aneurysm and laceration of the full arterial wall were discovered, both of which were occluded by a hematoma. The distal part of the proximal ophthalmic artery was clipped. The patient's neurological status did not change after the operation.

### Discussion

Cerebral aneurysms are usually classified as congenital, arteriosclerotic, mycotic or traumatic. Traumatic intracranial aneurysms most frequently occur after blunt head injury, with only 10% resulting from projectile injury and 4% resulting

from non-projectile penetrating head injury.(3, 4, 5)Traumatic intracranial aneurysms are usually false aneurysms. Although rare, true traumatic intracranial aneurysms have also been noted after head injury.(6) In sharp contrast to congenital aneurysms, over 50% of traumatic aneurysms occur in patients under 30 years of age. Traumatic intracranial aneurysms frequently involve the distal cerebral vasculature.(7, 8, 3, 5, 10) Iatrogenic trauma to cerebral arteries during intracranial surgery is also a cause that is well-recognized. Aneurysms occurring after a penetrating gunshot wound injury to the orbita are rare.(1, 2, 11)

Traumatic aneurysms may also be differentiated on a histological basis into true, false, mixed and dissecting aneurysms. True aneurysms arise when the arterial wall is only partially disrupted; the internal elastic lamina and media are damaged, but the adventitia remains intact, forming the outer wall of the aneurysm. A false traumatic aneurysm is the most common and results from laceration of the full arterial wall, which is occluded by a hematoma; subsequent fibrous organization and hemodynamic excavation of the hematoma result in aneurysm development.(2, 4) Traumatic cerebral injuries have an unpredictable course and may undergo spontaneous thrombosis, enlargement, or catastrophic rupture.(2, 11, 12) Digital subtraction angiography is standard for diagnosis, but other methods such as plain radiographies, computerized tomography and magnetic resonance imaging should be employed. Traumatic aneurysms are distinguished on cerebral angiography by a broad base, irregular appearance, slow filling and delayed emptying.(4, 11)

Our report presents a case of traumatic ophthalmic artery aneurysm after a penetrating projectile injury. The first case of a traumatic superior cerebellar artery and ophthalmic artery aneurysm was reported by Ferry and Kempe in 1972. Ligation of the ophthalmic artery and superior cerebellar artery was performed with a good outcome, leaving the patient with a blind left eye.(12) The second case of traumatic artery



**Figure 1:** Digital subtracted left carotid angiogram, lateral projection, showing left ophthalmic artery, arrow-shaped bullet and aneurysm caused by gunshot injury.

aneurysm was reported in a 15-year-old following a blunt head injury, which was treated by clipping the ophthalmic artery just proximal to the aneurysm. (9) Although spontaneous healing of post-surgical aneurysms and post-traumatic aneurysms has been reported, we recommend

that a patient with a traumatic aneurysm undergo definitive surgical treatment whenever possible because of the unpredictable course of this entity and the high mortality rates associated with hemorrhage resulting from the progressive increase in the size of the sac.

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