

Orbital arteriovenous fistula

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An orbital arteriovenous fistula (AVF) is a rare vascular abnormality that involves an abnormal connection between the arterial and venous blood vessels within the orbit of the eye. This can lead to abnormal blood flow and increased pressure within the affected vessels, which can result in a variety of symptoms.

Symptoms of an orbital AVF can include vision changes, eye pain, proptosis (bulging of the eye), redness of the eye, and in severe cases, blindness. In some cases, patients may also experience headaches, pulsatile tinnitus (ringing in the ears that coincides with the heartbeat), and facial swelling.

The causes of orbital AVFs are not entirely clear, but they can occur spontaneously or as a result of trauma to the orbit or head. Diagnosis usually involves a thorough eye exam, imaging studies such as MRI or CT scans, and angiography to evaluate the blood vessels.

Treatment options for orbital AVFs depend on the size and location of the abnormality and the severity of symptoms. Some patients may require no treatment at all if the symptoms are mild, while others may require surgery or embolization (blocking the blood flow through the abnormal vessels) to prevent further complications. Close monitoring of the condition is typically necessary to ensure that the symptoms do not worsen over time.

Case reports

The patient presented with left-sided [chemosis](#), [exophthalmos](#), and progressive [visual loss](#). [Cerebral angiography](#) showed a left orbital [arteriovenous malformation](#) and an associated [hematoma](#), with the point of fistulation between the left [ophthalmic artery](#) and the anterior section of the [inferior ophthalmic vein](#), with retrograde flow through the [superior ophthalmic vein](#). Transvenous embolization through the anterior facial and angular veins was unsuccessful, with residual [shunting](#). Stereotactic-guided direct venous puncture and [Onyx](#) embolization was subsequently performed in

the [hybrid operating room](#) (OR) to cure the fistula. A subciliary incision allowed for retraction of the orbital contents, creating an optimal trajectory. An [endonasal endoscopic approach](#) was performed after the [embolization](#) to decompress the orbit. This procedure is shown in video 11-11neurintsurg;jnis-2023-020145v1/V1F1V1Video 1 ¹⁾.

A 24-year-old female presented to the emergency department with swelling of the forehead and oculus sinister. A soft, compressible glabellar swelling with proptosis of the oculus sinister was noted on clinical examination. Cerebral angiography revealed a left medial orbital wall arteriovenous fistula with feeders from the left internal maxillary artery, left superficial temporal artery, and left ophthalmic artery. During the cerebral angiography, a diffuse intracranial venous anomaly and left basal ganglia arteriovenous malformations were also noted. A diagnosis of [Wyburn-Mason syndrome](#) was made, and the patient underwent catheter embolization of the orbital arteriovenous fistula. After glue embolization of the left external carotid artery feeders, the patient experienced a 50% reduction in glabellar swelling in the immediate postoperative period. Glue embolization of the left ophthalmic artery feeder was planned after six months during the follow-up period ²⁾.

¹⁾

Robledo A, Frank TS, Karas PJ, Shaltoni H, O'Leary S, Darling R, Kan P. Stereotactic-guided direct orbital puncture for treatment of orbital arteriovenous fistula. J Neurointerv Surg. 2023 May 4;jnis-2023-020145. doi: 10.1136/jnis-2023-020145. Epub ahead of print. PMID: 37142395.

²⁾

Vaithialingam B, Gopal S, Sohrab M. Catheter Embolization of an Orbital Arteriovenous Fistula in a Patient With Wyburn-Mason Syndrome. Cureus. 2023 Mar 31;15(3):e36949. doi: 10.7759/cureus.36949. PMID: 37131550; PMCID: PMC10149032.

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