Dilated orbital vein causing Valsalva-induced proptosis

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ABSTRACT

This case report highlights intermittent proptosis precipitated by exercise or Valsalva maneuvers. Conventional orbital computed tomography scan and catheter angiography did not disclose any orbital vascular lesion. Orbital B-scan ultrasonography, however, before and after a Valsalva maneuver demonstrated intermittent orbital vein dilation adjacent to the optic nerve of the left eye. Clinicians should be aware that anatomic venous variations and vascular malformations including orbital varices may produce a characteristic symptom of recurrent proptosis with Valsalva or head position. Conventional structural orbital imaging (e.g., computed tomography or magnetic resonance imaging) may not demonstrate a lesion.

KEYWORDS Orbital varices; orbital varix; orbital vein; proptosis

Orbital varices are vascular hamartomas consisting of a plexus of thin-walled, distensible, low-flow vessels that are commonly intrinsic to the normal circulation.¹ We report a previously healthy woman who presented with recurrent episodes of pain and pressure behind her eye leading to intermittent proptosis precipitated by Valsalva maneuvers.

CASE PRESENTATION

A 37-year-old white woman presented with recurrent episodes of pain and pressure sensation behind her left eye (OS). The orbital pain was associated with intermittent proptosis and the sensation of “vein engorgement” on the ipsilateral side of her head. The symptoms and signs were precipitated by exercise and Valsalva maneuvers. On several occasions the symptoms were so severe as to produce nausea and vomiting. Past medical history was significant for well-controlled hypertension and diabetes mellitus type 2.

The neuro-ophthalmic examination revealed normal visual acuity (20/20) in both eyes and isochoric and reactive

pupils without relative afferent pupillary defect. There was no lid lag or lid retraction. The slit lamp examination, intraocular pressure measurements, and fundus examinations were normal in both eyes. Hertel measurement at a base of 110 was 24 mm in the right eye (OD) and 25 mm OS and increased to 26 mm OS after the Valsalva maneuver, but the OD measurement remained unchanged (*Figure 1*). The patient was advised to avoid excessive Valsalva maneuvers and weight-lifting exercise programs.

Routine laboratory testing included thyroid function studies—thyroid-stimulating hormone, thyroid-stimulating immunoglobulin, and thyroperoxidase antibody. Computed tomography (CT) scan of the orbits after Valsalva maneuver demonstrated slight prominence of the medial recti muscles without exophthalmos, but no other vascular lesions were visualized. B-scan ultrasonography while performing a Valsalva maneuver demonstrated no change in the OD and demonstrated vessel dilation adjacent to the optic nerve OS consistent with an orbital varix (*Figure 2*). CT angiography of the head, standard cerebral catheter angiogram, and magnetic resonance imaging of the brain were negative for intra-orbital vascular lesions (*Figure 3*).

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Figure 1. Frontal and inferior view at presentation. Mild proptosis in the left eye is appreciated from both views (star).

Figure 2. B-scan ultrasonography of the left eye (a) under normal conditions and (b) with the Valsalva maneuver. Under Valsalva maneuver, a space-occupying change was noted adjacent to the optic nerve consistent with a dilated orbital vein by ultrasound criteria (circled). Courtesy of Thomas Prager, PhD, Houston Eye Associates.

Figure 3. Orbital venogram under fluoroscopic control. A vein over the left forehead was cannulated. (a) Contrast filled the left orbital rim down to the external jugular vein. (b) With compression of the external jugular vein, selective venogram demonstrated filling of the facial vein. No contrast was shown to enter the orbit, suggesting that there was no clear evidence of an orbital varix.

DISCUSSION

Varices typically manifest in the second or third decade of life and result from a presumably congenital weakness in

the postcapillary venous wall, leading to proliferation of venous elements and massive dilatation of the valveless orbital veins.² Stress or Valsalva-related proptosis is the most common presenting sign and results from activities that increase venous pressure (e.g., coughing, forward bending, or breath holding).² Most orbital varices have a large communication with the venous system and can be visualized on routine structural imaging (e.g., CT or magnetic resonance imaging); however, some varices have venous communications that are too small to visualize on conventional imaging. Although the natural history of orbital varices is typically benign, rarely patients may present acutely with orbital thrombosis and hemorrhage.² The diagnosis of a dilated orbital vein or varix can sometimes be demonstrated by performing the orbital ultrasound with and without the Valsalva maneuver. The presence of a hypoechoic vascular structure with dilation and intrinsic flow during the Valsalva maneuver may be diagnostic and may be especially useful in cases with negative orbital structural imaging, as in our case.³

Treatment of symptomatic orbital varices includes endovascular intervention and surgical excision, but most patients only require reassurance.⁴ Clinicians should be aware of the unique and distinctive symptom of Valsalva- or exercise-induced proptosis and pain. Patients with this symptom may have negative structural imaging studies, and an orbital B-scan ultrasound with and without the Valsalva maneuver may be diagnostic.

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