Retrobulbar Hemorrhage

Inferolateral Anterior Orbitotomy for Emergent Management

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Retrobulbar hemorrhages may occur from facial trauma, orbital surgery, and peribulbar or retrobulbar injections. Although a retrobulbar hemorrhage reportedly occurs in less than 2% of retrobulbar anesthetic injections, it may result in a devastating loss of vision by compression of the circulation from mechanical tamponade, central retinal artery occlusion, or optic atrophy if not detected and treated immediately. The majority of retrobulbar hemorrhages can be managed conservatively with digital ocular massage or intravenous acetazolamide or mannitol. However, further surgical intervention is indicated when vision is at risk.

This is a case of a retrobulbar hemorrhage following retrobulbar anesthetic injection for a routine retinal procedure. In the office setting, a lateral canthotomy and inferolateral cantholysis were performed, which produced minimal decompression. Scissors were introduced through the inferolateral defect into the retrobulbar space for successful drainage of the hematoma. The inferolateral orbitotomy approach to the retrobulbar space is a safe, rapid, and effective adjunctive procedure that should be included in the ophthalmologist's armamentarium for immediate decompression of a retrobulbar hemorrhage.

REPORT OF A CASE

A 62-year-old woman underwent laser photocoagulation for clinically significant macular edema of the right eye. Four milliliters of a retrobulbar block (2% lidocaine hydrochloride with 1:100 000 U of epinephrine) were given via a transconjunctival approach with a 1.5-in, 25-gauge blunt needle.

Within seconds, severe proptosis of the right globe was noted. The orbit was tense with significant resistance to retropulsion, no ocular motility, a dramatic decrease in visual acuity, bulbar chemosis, and complete ptosis. The eyelids were tight with distraction of 0 mm. The intraocular pressure was greater than 60 mm Hg by applanation.

Lateral canthotomy and inferior cantholysis were promptly performed by an oculoplastic surgeon (B.N.L.). Although some decompression was achieved, the orbit remained tense. An additional inferolateral anterior orbitotomy resulted in a dramatic release of the sequestered blood.

Following decompression, the intraocular pressure measured 9 mm Hg, with complete return of preoperative visual acuity.

The lateral canthal incision was left open to allow further egress of blood, and repair of the canthus was performed 4 days later. One week postoperatively, the patient continued to do well, having normal intraocular pressure, visual acuity, pupils, and motility.

SURGICAL TECHNIQUE

Local infiltrative anesthesia using 2% Xylocaine was given to the lateral canthal region.

1. Lateral canthotomy: Toothed forceps and straight iris scissors were used to incise the skin and orbicularis muscle at the lateral canthal angle in a horizontal direction extending for 10 mm (Figure 1).

2. Inferior cantholysis: Using the forceps to pull the lateral lower eyelid away
from the globe, the closed tips of the scissors pointing inferolaterally away from the globe were used to strum the inferior crus of the lateral canthal ligament. The inferior crus, felt as a thick fibrous band suspending the lateral lower eyelid to the orbital rim, was incised near its insertion into the orbital rim (Figure 2). The lower eyelid was thus released, and a small amount of hemorrhage exited the wound.

However, the globe remained tense and proptotic. It was not felt that lysis of the superior crus would provide any greater release of hemorrhage, as the hemorrhage appeared sequestered within the retrobulbar space. Entry into the intraconal space through the orbital septum was required.

1. Inferolateral anterior orbitotomy: The surgical approach through the lateral canthotomy defect into the inferolateral quadrant of the orbit permitted safe access into the retrobulbar space while avoiding vital orbital structures. Spreading movements were made with curved blunt scissors to enter the orbital septum and inferotemporal orbit between the lateral and inferior rectus muscles (Figure 3). The scissors were advanced posteroseromedially behind the globe, with closed tips to prevent inadvertent injury. The tips were spread gently to open the numerous orbital fat compartments made by fibrous septa. An immediate surge of blood exited the wound with rapid decompression of the orbit, confirming that the hemorrhage had been sequestered within the compartments behind the globe and inadequately decompressed with cantholysis alone. The orbitotomy was performed in the examination chair and the patient tolerated the procedure well without complications.

**COMMENT**

Acute orbital hemorrhage is a rare complication of regional ophthalmic anesthesia, with an incidence of 0.44% to 1.7%. The inferolateral anterior orbitotomy is easily performed in an emergent setting. In most cases, the hemorrhage is diffused within the orbit and is effectively treated with lateral canthotomy and cantholysis.

Any entry into the orbit must take into consideration the extracocular muscle locations. A superotemporal approach places the lacrimal gland at risk. In the superonasal orbit, the superior oblique tendon and trochlea are located 5 to 10 mm posterior to the orbital rim.

In the inferonasal quadrant, the nasolacrimal sac is located in the fossa between the anterior lacrimal crest of the maxillary bone and the posterior lacrimal crest of the lacrimal bone. The inferior oblique muscle arises from a depression in the anteromedial orbital floor just lateral to the lacrimal sac fossa.

Dissection within the inferotemporal quadrant avoids the structures mentioned (Figure 4). Blunt, gentle, spreading movements toward the orbital apex displace vessels and nerves without injury while opening the separate retrobulbar spaces created by the extensive fibrous network within the orbit. Opening the fibrous septa throughout the retrobulbar space allows egress of any compartmentalized orbital hemorrhage.
A similar approach to the orbit through the inferolateral quadrant has been used extensively in orbital fat decompression for Graves orbitopathy. No complications related to the surgical technique were encountered, which further supports the safety of the surgical approach.

Markovits used an 18-gauge needle along the supraorbital rim to evacuate a hematoma. Risk of globe perforation or other iatrogenic injury from the sharp needle may limit the usefulness of this technique. An orbital floor decompression technique proposed by Liu involves using a clamp along the medial orbit to fracture the orbital floor and maxillary sinus mucosa for decompression of the hemorrhage. Infraciliary nerve injury, enophthalmos, ocular motility disturbance from injury to the inferior oblique or rectus muscle, orbital cellulitis, and sinusitis were not encountered, although these may be potential risks.

CONCLUSION

A thorough understanding of orbital anatomy and the techniques for emergent decompression are important for any physician. Lateral canthotomy and superior and inferior cantholysis should always be attempted first. An inferolateral anterior orbitotomy should then be considered, as it is a safe and effective technique for orbital decompression that supplements the traditional techniques. It is easily and rapidly performed at the bedside with limited instrumentation, and it may ultimately preserve vision.

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REFERENCES