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Occult Globe Perforation During Medial Canthopexy

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Abstract

Purpose—To report a case of occult globe perforation following craniofacial surgery.

Methods—A 16-year-old female presented with vision loss and hypotony of her left eye following a craniofacial procedure, including bilateral medial canthopexy. This report describes the evaluation and findings following the craniofacial surgery.

Results—Following recognition of vision loss and concern for rupture, surgical exploration was performed by an ophthalmologist at an outside institution on suspicion of globe penetration/perforation. Surgical exploration did not identify any scleral entry/exit sites. She was then referred to retina. Serous choroidal detachments and associated retinal detachment were identified on ultrasound. The patient was maintained on her postoperative oral antibiotics and followed closely. As the intraocular pressure improved, the choroidals began to resolve. Two retinal break sites were identified on opposite sides of the globe in the retina periphery. Laser retinopexy was performed at the two penetration sites. The patient recovered excellent vision without any additional complications.

Conclusion—Early recognition and high suspicion of globe injury is critical in cases of postoperative vision loss following craniofacial surgery.

Keywords

ruptured globe; surgical complications; globe perforation; medial canthopexy; otolaryngology; orbital surgery; craniofacial surgery

Introduction

Intraoperative penetration/perforation of the globe by wire, needle, or other hardware is a potential complication of periorbital craniofacial procedures such as blepharoplasty and canthopexy. Occult open globe injury due to electrocautery tip penetration of the globe during endoscopic nasal adenoidectomy has been reported previously.¹ This report presents a case of occult globe perforation occurring during medial canthopexy.

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Case Report

A 16-year-old woman female noted significant vision loss in the left eye after awakening from anesthesia for craniofacial reconstructive surgery. The surgical procedure included bilateral medial canthopexy, rhinoplasty, and forehead fat injections. Visual acuity in the affected eye was hand motions. Head CT scan revealed a collapsed left globe consistent with “globe rupture.” An ophthalmology consult was obtained and globe exploration was performed. The muscles were not taken down at the time of exploration, but no areas of ocular penetration/perforation were identified. At this time, examination revealed a large choroidal detachment, hypotony, and concern for an associated retinal detachment and referred for vitreoretinal consultation..

At the time of presentation to vitreoretinal consultation, the patient's visual acuity remained at hand motions and her intraocular pressure was hypotonous at 4 mmHg. The anterior segment was quiet and unremarkable with the exception of the sutured conjunctival periotomy from the recent exploration. Due to mild vitreous hemorrhage and choroidal detachments, there was only limited view to the posterior segment. Ultrasonography revealed serous choroidal detachments with associated subretinal fluid (Figure 1). She was continued on her postoperative oral cephalexin, topical moxifloxacin, topical atropine and topical prednisolone and observed closely.

Over the next few days visual acuity in the affected eye improved to 20/200. Fundus exam revealed an inferotemporal peripheral penetration site with mild vitreous hemorrhage and intraocular sclera. Laser retinopexy was performed at this site. With continued spontaneous improvement of the choroidal detachments, an inferonasal penetration site with associated retinal break was identified, confirming globe perforation. Laser retinopexy was performed at this second site (Figure 2). The patient was observed closely without any signs of endophthalmitis or progressive retinal detachment. Over time, the choroidal detachments and subretinal fluid completely resolved and visual acuity continued to improve. Visual acuity improved to 20/20 and intraocular pressure was 17 mmHg at 6-month follow-up.

Discussion

This report presents a case of occult globe perforation occurring during craniofacial surgery. Given the two retinal break sites on opposite sides of the globe, one possible mechanism of injury in this case is penetration of a transnasal awl or wire through the left globe during medial canthopexy. In this procedure, a transnasal hole may be created by drilling or passing an awl from a contralateral incision towards the orbit. A wire suture secured to the medial canthus tendon (MCT) is then passed through the transnasal hole and secured to the contralateral frontal bone.² Given the close proximity of the eye, precautions must be taken to protect against iatrogenic injury to the globe.

This case demonstrates several challenges posed in the detection and management of globe injury in a postoperative patient. Perforation of the globe (i.e. entry and exit) in this case occurred without detection by the surgical team, highlighting the importance of vigilance regarding potential ocular injury during periorbital procedures such as canthopexy. Rapid

and comprehensive evaluation of postoperative vision complaints following such procedures is critical to avoid permanent vision loss. In addition, exploratory surgery may not identify small or posterior penetration sites that are clinically significant, as likely occurred in this case given the presumed mechanism of injury. This case highlights the critical importance maintaining a low threshold of suspicion for occult globe injury in cases of vision loss in the postoperative period.

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Summary Statement

Occult globe perforation is a potential devastating complication of craniofacial surgery and must be suspected in cases of postoperative vision loss. Early recognition is critical to address any traumatic sequelae and maximize chances for optimal recovery.

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Figure 1. B-scan ultrasonography of involved globe

Ultrasound identifies globe deformation with irregular contour (arrowheads) as well as choroidal detachments and associated subtle subretinal fluid (arrow). The overall vitreous cavity (asterisk) is notably small due to globe deformation. Orientation is clarified with “Front” delineating location of the cornea, and “Back” delineating the orbit and posterior portion of the globe.

Figure 2. Retinal findings following ocular perforation

A. Widefield color fundus photograph of the left eye revealing presumed entry site (white arrowhead) in the nasal retina and exit (blue arrowhead) site in the temporal retina following laser retinopexy. B. High magnification view of the exit site (arrowhead) following laser retinopexy (i.e. circular areas of whitened retina around exit site) with mild vitreous hemorrhage and intraocular sclera (asterisk). C. Optical coherence tomography scan of the left macula demonstrating choroidal (arrowheads) and retinal folds secondary to hypotony. D. OCT scan at six months follow-up showing resolution of the choroidal and retinal folds with normalized architecture.