

Acute Angle Closure Following Uncomplicated Pterygium Excision

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Abstract

Introduction: Pterygium excision is a commonly performed procedure, with known and established complications. Acute angle closure is not a reported complication following routine pterygium extraction. We report a patient who had routine pterygium excision, and subsequently developed an angle closure attack.

Case Description: A 56-year-old female presented to the ophthalmology clinic with a pterygium and an asymmetric cataract, greater in the right eye. Prior to A-scan and keratometry for cataract surgery, the pterygium was removed, using lidocaine with epinephrine for anesthesia and hemostasis. The pupil dilation subsequent to the epinephrine precipitated an angle closure episode the following day, and was treated successfully with laser peripheral iridotomy.

Discussion/Conclusion: This case highlights the importance of gonioscopy, anterior chamber assessment, and lenticular examination prior to any ocular procedure or use of medications that can affect pupil and angle anatomy. We also advise judicious use of epinephrine with anesthetic in narrow angled eyes.

Keywords: Angle Closure; Pterygium; Pterygium Excision; Epinephrine; Anatomical Narrow Angles

Abbreviations

OD: Right Eye; OS: Left Eye; O/S: Both Eyes; IOP: Intraocular Pressure; PSC: Posterior Subcapsular; POD1: Post-Operative Day 1; LPI: Laser Peripheral Iridotomy

Introduction

Pterygium excision is a frequently performed procedure, both in the United States and internationally. The common indications for excision of a pterygium are infringement on the visual axis, cosmesis, and ocular surface disease related to inflammation, dry eye and surface irregularity. Though recent literature also shows that a large pterygium can affect intraocular lens calculation for cataract surgery, which provides an additional indication for excision [1]. Many surgical techniques have been explored for performing this surgery, including bare sclera technique, conjunctival autograft, amniotic membrane graft, and adjuvant anti-metabolites [2]. The commonly listed complications associated with this procedure are corneal edema, corneal infiltrate/ulceration, corneal haze, poor conjunctival healing, inadvertent intraocular penetration, and pterygium recurrence [3]. As pterygium removal is all done at the corneal and conjunctival surface, and no components of the intended procedure are done intraocularly, anterior chamber angle closure is not typically thought of as a complication of this procedure. To our knowledge, no previous cases have been reported in which a patient developed acute angle closure attack following uncomplicated pterygium excision.

We report a patient who presented with cataract associated decreased vision and large pterygium, who developed acute angle closure following the pterygium excision.

Case Description

A 56-year-old female, with past medical history of hyperlipidemia and no past ocular history, presented to the ophthalmology clinic with a progressive decrease in vision OD > OS. On examination, her vision was counting fingers at 1' in the right eye, and 20/60 improving to 20/30 with pinhole in the left eye. Her pupils reacted normally, and her intraocular pressures were within normal limits (14 mmHg OU). On anterior exam, the right eye was found to have a large, raised, nasal pterygium, extending approximately 3 mm into the cornea. The anterior chamber was noted to be shallow, and a 3+ cortical, and 3+ posterior subcapsular (PSC) cataract was noted. Gonioscopic exam at that time was not performed. The fellow eye was found to have a 2+ PSC, but was otherwise normal. A B-scan ultrasound was performed in the right eye due to the limited view, which was normal, as was a dilated fundus exam of the left eye. It was presumed that the patient's right-sided vision loss was due to her lenticular changes, thus cataract extraction with intraocular lens implantation was the ultimate plan. However, it was thought that the large pterygium was inducing an irregular corneal astigmatism, which would affect the intraocular lens power measurements. Thus, a pterygium excision was planned prior to cataract extraction.

The patient returned for pterygium excision. The day of the procedure, the exam was unchanged, and the IOP in the eye of interest was 15 mmHg. The procedure was completed without complication, briefly described below.

The eye was prepped in sterile ophthalmic fashion with 10% povidone-iodine solution, and anesthesia was achieved with topical proparacaine initially, and then subconjunctival 1% lidocaine with epinephrine. The pterygium was excised with an approximately 1 mm margin of healthy conjunctiva, exposing an area of bare sclera. A conjunctival autograft was elevated with subconjunctival lidocaine 1% with epinephrine and dissected above the superior limbus, transposed over to the area of bare sclera, and glued down using fibrin adhesive. Upon completion of the procedure, a combination ointment (Maxitrol: dexamethasone/neomycin sulfate/polymyxin B) was instilled into the fornix, the eye was patched, and the patient went home with instructions to follow up the following morning.

The following morning, the patient returned for her POD1 examination, complaining of a painful, irritated right eye. Examination revealed hand-motion vision, and an intraocular pressure of 35 mmHg. Anterior exam was consistent with acute angle closure glaucoma showing microcystic corneal edema, a shallow anterior chamber and a mid-dilated fixed pupil. The gonioscopic exam revealed no angle structures in all four quadrants. The patient was given intraocular pilocarpine 1% and cosopt (dorzolamide/timolol) in the office, which lowered the IOP to 28 mmHg. With the patient appearing to be in angle closure, it was decided that a laser peripheral iridotomy needed to be performed. The LPI was completed at the 11 o'clock position on the iris. The patient was instructed to return the following week. At follow up, the IOP was 14 mmHg, off all drops. Gonioscopic exam showed a deeper angle and the trabecular meshwork was visible in 4 quadrants, thus the angle closure episode had been broken. The patient ultimately underwent cataract extraction with IOL placement in the right eye, with POM1 vision of 20/20 and a deep anterior chamber.

Discussion

Angle closure following pterygium excision has not been previously reported in the literature. The reason behind the angle closure in this case must be closely analyzed. First, the patient was already predisposed to a shallow anterior chamber due to her existing dense cataractous changes. Lens-induced angle closure is a well-described phenomenon, by which a hydrated lens swells and pushes the lens-iris diaphragm forward, shallowing the anterior chamber and possibly causing papillary block [4-6]. Thus, even prior to pterygium excision, this patient was predisposed to more narrow angles in the eye due to her asymmetrically dense cataract. However, as pterygia are very common in the elderly, especially in certain geographic areas, many pterygium excisions are likely being performed on patients with lens changes [7]. If patients with cataracts who undergo pterygium excision are predisposed to the angle closure, this complication would likely be reported more frequently. Therefore, at least one other factor must have been responsible.

Another very compelling argument behind the patient's angle closure involves the administration of subconjunctival 1% lidocaine with epinephrine. Epinephrine is a non-selective agonist of all adrenergic receptors, including α_1 , α_2 , β_1 , β_2 , β_3 . Traditionally, it is used in ophthalmology practices for pupillary dilation. However epinephrine is often combined with anesthetics for its vasoconstrictive abilities, thus

reducing bleeding and drug clearance from tissues. Due to its strong mydriatic ability, the epinephrine injected subconjunctivally with the lidocaine could very likely have dilated the pupil and precipitated a pupil block and the angle closure attack. Thus, the subconjunctival injection of epinephrine can be implicated in the patient's angle closure. Also, subconjunctival delivery of drug has been shown to have deeper penetration through the cornea compared to topical medication [8]. Thus, subconjunctival mydriatic agents may precipitate an attack even in eyes that had previously received topical mydriatics.

It should be noted that the patient was given steroid-containing eye ointment upon completion of the case. However steroid-related IOP increase are typically not seen after single administrations of topical agents. One study found that 0.1% dexamethose, which was the steroid and concentration in the combination this patient received, caused a modest rise in IOP after 8 days of use [9]. In addition, this patient's exam showed clear signs of acute angle closure attack. Steroid-induced glaucoma is a secondary open-angle glaucoma, and does not exhibit anatomical angle closure or pupillary block.

Conclusion

The etiology of this patient's angle closure attack was likely multifactorial. The subconjunctival epinephrine used in our patient lead to pupil dilation which in an eye with anatomically narrow angles due to the intumescent cataractous lens precipitated the attack. This case provides a crucial consideration to practitioners who use lidocaine with epinephrine when performing pterygium excisions, and can also be extrapolated to other ocular procedures as well. First, a patient's anterior chamber status must be critically assessed with gonioscopic evaluation prior to pursuing any procedure. In addition to gonioscopy, the lens must be assessed, as one must be weary of a mature lens' ability to close the angle. Second, this case advises caution when using anesthetics combined with adrenergic agonists, such as epinephrine which can dilate the pupil. While there is benefit of the vasoconstrictive effect, strong mydriasis, especially with subconjunctival injection, can induce an angle closure attack.

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Conflict of Interest

No conflicting relationship exists for any of the authors.

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