



## Bilateral angle closure glaucoma following general anesthesia

Halil Ates, Özcan Kayıkçıoğlu & Kutay Andaç

*Ege University, Faculty of Medicine, Ophthalmology Department, 35100 Bornova Izmir, Turkey*

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### Abstract

Although unilateral angle closure glaucoma is quite common, simultaneous bilateral acute angle closure is very rare and is usually induced by an external cause. General anesthesia is a triggering factor for acute angle closure glaucoma. We report two cases of simultaneous bilateral angle closure glaucoma following non-ocular surgery under general anesthesia. One patient had cholecystectomy, the other craniotomy for tumor resection.

In the postoperative period following general anesthesia, any patient at risk for angle closure glaucoma should be followed closely; patients with periorbital pain and visual symptoms should be examined for angle closure glaucoma attack in both eyes.

### Introduction

Bilateral angle closure glaucoma has been described, although unilateral presentation is the commonly encountered form [1]. Inflammatory disorders like AIDS and herpes zoster, myelodysplastic syndrome, congenital anomalies and drug sensitivity reactions were reported in the ophthalmic literature as causes of bilateral angle closure glaucoma [2–6].

We present, in this manuscript, two cases of bilateral simultaneous angle closure glaucoma following cholecystectomy and craniotomy for tumor resection under general anesthesia.

#### Case 1

A 54 year-old woman was referred to our clinic for bilateral periorbital pain, nausea and decrease in visual acuity following cranial surgery. She had a cerebral right frontal lobe cystic mass removed surgically under general anesthesia, which yielded invasive hemangiopericytic meningioma upon histopathologic examination. Visual acuity was hand motions in the right eye, 0.3 in the left eye. There was bilateral deep hyperemia and the cornea of the right eye was edematous. Anterior chamber depths were shallow in both eyes. The patient had brown irides with semidilated pupils and sluggish light reaction. The iridocorneal angle was

difficult to evaluate due to corneal edema in the right eye, which was grade 0–1 with peripheral anterior synechiae especially in the upper quadrants [7]. The left eye had grade 0–1 on gonioscopic examination. The intraocular pressure was 49 mmHg in the right eye, and 38 mmHg in the left eye by applanation tonometry. Fundoscopy revealed slightly increased cupping, but the retina and optic discs were otherwise normal.

Medical therapy with mannitol 20%, acetazolamide and timolol maleate 0.5% was instituted. Because of poor patient cooperation and corneal edema, laser iridotomy was not attempted. Trabeculectomy was preferred due to peripheral anterior synechia in the right eye together with surgical iridectomy for the left eye in a single session under general anesthesia. Postoperatively the anterior chamber depth was normal. The intraocular pressure was 10 mmHg in the right eye and 17 mmHg in the left eye without antiglaucoma medication. Visual acuity did not change in both eyes.

#### Case 2

A 57 year-old female patient was examined for headache and red eyes following elective cholecystectomy for choledocholithiasis under general anesthesia. The patient reported that she occasionally had experienced periorbital pain and had seen halos around lights before surgery. Ophthalmic examination showed corneal

stromal edema and shallow anterior chamber depth bilaterally. The patient had brown irides, both pupillae were semidilated. Intraocular ocular pressure was 48 mmHg for the right eye, 42 mmHg for the left eye. Iridocorneal angles were grade 0–1.

The patient received medical therapy consisting of mannitol 20%, acetazolamide and timolol maleate 05%. Laser iridotomy was not possible due to the corneal edema. Surgical iridectomy was performed under retrobulbar anesthesia in both eyes. Intraocular pressure decreased to 14 mmHg for the right eye, 12 mmHg for the left eye. The corneal edema resolved, the anterior chamber deepened and the visual acuity increased to 1.0. Iridocorneal angles were grade 2 following the operation.

We reviewed the anesthesia records of both patients. It was found that the patients had parenteral atropine sulfate during the induction of anesthesia. As muscle relaxant, vecuronium was used.

## Discussion

Simultaneous bilateral angle closure is a very rare occurrence when compared with unilateral acute angle closure in predisposed eyes. Women are more prone to develop angle closure glaucoma due to anatomically more compact anterior chamber [1]. Both of our patients were female, one of whom mentioned symptoms of transient angle closure attacks before general anesthesia.

General anesthesia is known to induce angle closure glaucoma [8, 9]. Anesthetics, atropine, muscle relaxants may precipitate angle closure glaucoma attacks. Drug induced mydriasis may contribute to angle closure glaucoma. We reviewed the anesthesia records of our patients. It was found that both patients had parenteral atropine sulfate during the induction of anesthesia. As muscle relaxant, vecuronium was used. Mydriasis is more likely to occur in lightly pigmented irides [8]; however the iris color of the patients was brown.

If depth of general anesthesia becomes inadequate, then the pupils may dilate in reaction to pain which the patient may feel during surgery. This may be similar to herpes zoster or labor pain, which is reported to induce bilateral angle closure glaucoma [2, 10]. Psychological stress of surgery on patients may also increase the risk of glaucoma attacks [9].

Patients at risk for angle closure glaucoma in the postoperative period can be administered topical pilocarpine therapy to prevent any attack [8]. Oblique penlight illumination test is a simple and practical test to estimate anterior chamber depth which can be used by anesthesiologists to determine the population at risk. Following general anesthesia, patients with periorbital pain and visual symptoms should be examined urgently.

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*Address for correspondence:* H. Ates, Ege University, Faculty of Medicine, Ophthalmology Department, 35100 Bornova Izmir, Turkey  
Phone: +90 232 3881469; Fax: +90 232 3881469;  
E-mail: atesh@med.ege.edu.tr