Case Report

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A case report and literature review of a dislocated Sömmering ring with decompensated cornea presenting 14 years after lens aspiration and anterior vitrectomy

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ABSTRACT

Background : An anterior capsule edge adhering to the posterior capsule results in a post-cataract opacity (PCO) known as a Sömmering ring. Although it has also been recorded in cases of pseudophakic eyes, it is primarily linked to aphakic cases. When dislocation happens, it takes on clinical significance. The manuscript aimed to present a case of anterior dislocation of the Sömmering ring, which occurred 14 years following a lensectomy for congenital cataract.

Case Report : We report the visit of a 20-year-old man who complained of pain, photophobia, redness, and blurred vision in his right eye at the emergency room. It was established that the patient had bilateral amblyopia and had undergone anterior vitrectomy without intraocular lens (IOL) implantation 14 years before the presentation. Examining the eyes revealed that the cornea had 2+ diffuse edema with bullae and Descemet folds, the conjunctiva had moderate diffuse injection, and the intraocular pressure was normal. The semilunar-shaped solid white material in the anterior chamber, which was compatible with the Sömmering ring, was present in the deep anterior chamber. A dilated fundus examination revealed a blurry image, and a flat retina and highly reflecting material in the vitreous cavity were shown by B-scan ultrasonography.

Conclusions : Inflammation and specific harm to the corneal endothelium can result from sömmering rings in the anterior chamber. In order to avoid corneal decompensation and endothelial cell loss, prompt surgical removal is necessary if this issue arises. One way to lower the likelihood of secondary PCO formation during initial surgery is to thoroughly clean the cortical tissue following lens removal. One option for lowering the risk of future Sömmering ring formation and associated issues in myopic eyes is to consider implanting an intraocular lens (IOL).

KeyWords : Aphakia • Aphakia, Postcataract • Postoperative Complications • Corneal Edema • Primary Prevention

INTRODUCTION

Background

At a Saudi Arabian tertiary eye care facility, cataracts account for 6.3% of bilateral and 12.1% of unilateral blindness in juvenile patients [1]. After the lens is removed, a type of post-cataract opacity known as a Sömmering ring develops as a result of the anterior capsule margins adhering to the posterior capsule [2]. Since the ring is typically concealed by the iris, visual signs are unlikely to occur. Dislocation of the Sömmering ring, however, may cause clinical aftereffects. Glaucoma is the most frequent side effect of its front dislocation, whereas posterior dislocations impair vision by blocking the pupillary zone [3]. The signs, symptoms, and management of Sömmering ring, which appeared 14 years after lens aspiration and anterior vitrectomy, are described in the current case report. We also provide an overview of the relevant literature about this problem.

Case Report

A 20-year-old male arrived at the ER two days ago complaining of photophobia, redness, pain in his right eye, and blurred vision. He reported experiencing comparable symptoms in the same eye on a regular basis for years. Before receiving a consultation for bilateral congenital cataracts, he had a normal medical history, with the exception of bilateral lens aspiration and anterior vitrectomy, which occurred 14 years earlier. Because of the extreme myopia, the intraocular lens (IOL) power calculation was 0 diopters; hence, no IOL implantation was done. The patient experienced bilateral amblyopia as a result of the delayed therapy of his cataracts.

During the current incident, the patient's right eye's

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uncorrected visual acuity (UCVA) was 6/200 upon assessment in the emergency room. Pinhole testing allowed for an improvement to 20/400. The lashes and lids were regular. The intraocular pressure was 18.5 mmHg. The cornea exhibited 2+ widespread edema with bullae and Descemet folds, while the conjunctiva had mild diffuse injection. According to Figure 1, the anterior chamber was deep and had an opacified lens material ring around it. Iridodonesis was evident, and the pupil was reactive.A dilated fundus exam was performed, but the view was unclear and aphakia was not found. Highly reflective material in the vitreous cavity and a flat retina were shown by B-scan ultrasonography (Figure 2). An indication of a dry macula was found by posterior segment optical coherence tomography. As a result, topical lubricating drops, ofloxacin 0.3% eye drops, sodium chloride eye drops, and ointment were used to start the medical treatment. The patient's care also included the surgical retina team, and as the cornea began to clear, the patient was scheduled for pars plana removal of the Sömmering ring. Upon examination, the left eye revealed an aphakic eye with a clean cornea, an intraocular pressure of 20 mmHg, and an uncorrected visual acuity of 20/300. The Sömmering ring spontaneously migrated into the vitreous cavity upon pupil dilatation of the right eye.

One of the most frequent problems following surgery is posterior capsular opacification (PCO), which is formed in the equatorial area [3]. The epithelium multiplies, elongating the posterior capsule and growing around the anterior capsule's edge. A ring known as the Sömmering ring forms on the lens capsule's periphery [5]. It was first reported in 1828 in people who had already undergone cataract surgery who had passed away [6]. After trauma or surgical intervention in cases of Sömmering ring, the lens's nucleus is always gone [5].

In order to treat her bilateral congenital cataract and axial myopia, our patient had previously had bilateral lens aspiration, anterior vitrectomy, and IOL implantation. He presented with corneal edema and a dislocated Sömmering ring in the anterior chamber of his right eye fourteen years later. Dislocated Sömmering rings are rarely reported in the literature. This patient was predisposed to Sömmering ring formation by a number of variables, including early cataract surgery and postoperative aphakia [5,8,9]. Wilson et al. observed that early lensectomy frequently results in the formation of Sömmering rings [7].

This may be due to a number of reasons, such as the use of a smaller anterior capsulotomy, which has been shown to support appropriate lens fiber differentiation and lens regeneration because it preserves more lens epithelial cells beneath the anterior capsule than a larger capsulotomy [8]. A sealed microenvironment created by the adherence of the anterior and posterior capsulotomy edges to one another may inhibit the action of inflammatory cytokines in promoting the transition of epithelial to mesenchymal cells. The ciliary zonule holds the Sömmering ring in place in the retro-iridal region, and it is only visible when there is dislocation [5]. After examining 11 examples of dislodged Sömmering rings, Guha concluded that myopia is a predisposing factor for ring displacement. Eight of these cases involved myopia. Dislocation is linked to abnormalities in the eye caused by myopia, including vitreous liquefaction, ciliary body atrophy, zonule degeneration, and a deep anterior chamber. Guha's research further revealed that 6 of the 11 cases developed secondary glaucoma and that 5 of the 11 instances had spontaneous ring dislocation [9]. Though Sömmering rings have also been reported in pseudophakic eyes [10], aphakia is one of the most common conditions. In order to address high myopia, a 65-year-old man who had cataract surgery 53 years prior but remained apha-kic was recently the subject of a case study by Awad et al. Even so, the Sömmering ring was removed following blunt trauma [3], despite the lengthy period of time without any issues.Even in situations where small lens powers are required to reduce the risk of Sömmering ring formation and dislocation, Akal et al. reported a case of a Sömmering ring dislocation into the anterior chamber, causing a pupillary block in an 84-year-old patient who had undergone cataract extraction several years prior and remained aphakic. In the event of a dislocation, the IOL may theoretically function as a barrier to stop such a problem.

DISCUSSION

Currently, the success rate of cataract surgery is great, with very few postoperative problems [4]. The potential for fibrogenic growth of the residual lens epithelial cells found in the myopia capsule [11]. Aphakia, degenerative changes within the ring, senile changes in the eye, and early development are other variables that may contribute to ring dislocation [5]. Patients may present with glaucoma in the event that they experience anterior dislocation of the Sömmering ring, which happens more frequently [12]. Inflammation-related open-angle glaucoma and increasing corneal edema were the results of an anteriorly displaced Sömmering ring, as reported by Peck et al 4]. After phacoemulsification, an 80-year-old woman presented with progressive synechial angle closure without pupillary block; remarkably, the eye was pseudophakic [13]. Kung et al. reported a case of anterior dislocation of an enlarged Sömmering ring in this patient.Two methods of angle closure have been proposed: acute angle closure from an extended Sömmering ring with pupillary block, and progressive angle closure without the pupillary block [12]. Not insignificant visual impairments have been reported as a consequence of posterior dislocation of the Sömmering ring [9]. In the vitreous cavity, Tooke reported three cases

of displaced Sömmering rings [14]. A slit-lamp examination cannot diagnose uveitis in cases when posterior displacement of the Sömmering ring causes inflammatory symptoms that resemble it [3].

This case study demonstrates the possible ocular morbidity linked to PCO and emphasizes the need to reduce PCO occurrence [4]. A recent study indicates that since alternate treatments, like in-the-bag IOL implantation, improved surgical techniques and approaches, and advancements in IOL materials and design, have been adopted, the rate of PCO following cataract extraction has reduced [11]. Three-piece IOLs have been demonstrated to considerably lower PCO formation than single-piece IOLs because of their bigger size [4].A posterior capsulorhexis is performed, and the IOL implant is subsequently buttoned into the posterior capsulorhexis opening, according to a technique reported by Menapace]. To stop capsular fibrosis and the formation of PCO, notably the Sömmering ring, the capsules of some of his patients were additionally polished.

In this instance, if the Sömmering ring had been aggressively removed prior to dislocation, the corneal decompensation and vision loss might have been avoided. The Sömmering ring, which is typically buried behind the iris and away from the visual axis, did, however, develop because of the rarity of this condition and the lack of symptoms. To lower the probability of Sömmering ring formation, prophylactic cortical excision is therefore essential in primary lensectomy surgery. The inflammatory potential of a Sömmering ring in the anterior chamber is illustrated by this example, particularly if it comes into contact with the corneal endothelium.In order to avoid more issues and provide the best possible care, it is imperative to think about removing the Sömmering ring from the anterior chamber right away. The current instance further emphasizes the significance of corneal decompensation, obstruction of the visual axis, and glaucoma. If issues arise from dislocation of the Sömmering ring, prompt surgical excision is necessary to prevent permanent injury. Consideration should be given to IOL implantation in myopic eyes in order to lessen the possibility of problems and eventual Sömmering ring formation.

CONCLUSIONS

When the anterior and posterior capsule margins cling to one another, a post-cataract opacity (PCO) known as a Sömmering ring develops. Anterior or posterior Sömmering ring dislocation can cause a number of problems, including corneal decompensation, glaucoma, and obstruction of the visual axis. In the event that difficulties arise from the dislocation of the Sömmering ring, prompt surgical removal is imperative to prevent permanent harm. The possibility of future Sömmering ring formation and associated difficulties can be decreased by considering IOL implantation in myopic eyes.

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