Pupillary Reconstruction Surgery

Pupilla Rekonstrüksiyonu Cerrahisi

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Case Report *Olgu Sunumu*

ABSTRACT

A pupilla with an irregular shape does not function well and results in glare, star bursts, photophobia, and unaesthetic appearance, thereby causing restrictions in daily activities. A timely and successful restoration of the pupilla will decrease the complications that the problematic pupilla causes and help the individual keep the health of the whole eye. In the current report we aimed to present a case with traumatic pupilla that underwent successful pupilla reconstruction.

Key Words: Pupillary reconstruction, penetrating eye trauma, surgery.

ÖZ

Düzensiz şekilli bir pupilla görevini gerektiği ölçüde yerine getiremez ve parıldama, fotofobi ve estetik olmayan görünüme yol açarak kişinin günlük hayatını kısıtlar. Zamanında ve başarılı bir pupilla restorasyonu sorunlu pupillanın yol açacağı komplikasyonları azaltır ve bireyin göz sağlığını korumasına yardımcı olur. Bizler bu çalışmada başarılı pupilla rekonstrüksiyonu cerrahisi uyguladığımız travmatik pupillalı bir olguyu sunmayı amaçladık.

Anahtar Kelimeler: Pupilla rekonstrüksiyonu, penetran göz travması, cerrahi.

Glo-Kat 2009;4:201-203

SUMMARY

A frequent late complication of a childhood penetrating eye injury is irregular pupilla.[1] A pupilla with an irregular shape does not function well and results in glare, star bursts, and photophobia.[2] Besides its unaesthetic appearance, the condition often causes restrictions in daily activities. Iris abnormalities such as abnormal pupil size, distortion, eccentricity, or aniridia are often observed in cases whose globe is penetrated or ruptured. Herein we report a case with traumatic iris that underwent successful reconstruction.

Geliş Tarihi : 21/07/2009
Kabul Tarihi : 02/09/2009

Received : June 21, 2009
Accepted : September 02, 2009

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CASE REPORT

A 6-year-old girl attended the out-patients clinic because of penetrating corneoscleral trauma to her left eye. The slit-lamp examination revealed iris, ciliary body and vitreous prolapses at the site of corneoscleral incision, and hyphema. The patient underwent an operation for treatment. A clear corneal incision was made. The anterior chamber depth was maintained by viscoelastic substance. The peripheral anterior synechiaes were lysed. The iris portion prolapsing at the site of corneoscleral incision was excised with a pair of scissors. Viscoelastics were first employed to separate the adhesions, and in case of failure, sharp dissection of the adhesions with a pair of coaxial micro-scissors was performed. Peroperatively, perforated anterior and posterior lenticuler capsules and cataractous lens were observed in the left eye. Therefore, a second operation to extract the cataractous lens was planned. At the end of the first operation, after replacement of the viscoelastic substance by balanced salt solution, interrupted 10-0 nylon sutures were used for closure of the corneal and traumatic incisions. The eye was covered after administration of topical antibiotic-steroid ointment.

Two weeks later, the patient underwent a second operation under general anesthesia which consisted of cataractous lens aspiration and intraocular lens implantation. The pupilla was updrawn postoperatively. Two and a half months after the second operation, the iris adhered to the previous traumatic corneoscleral incision site and the previously updrawn pupilla entirely disappeared (Fig. 1). Therefore, a third operation was required both to form a new pupilla and to restore the vision and decrease the risk of amblyopia. Thereafter, anterior chamber revision was performed and another central pupilla with a diameter of 3 to 4 mm was formed in the iris tissue by the help of a vitrectom (Fig. 2). The newly formed pupilla had a round shape during the early postoperative period whilst it became oval in the late postoperative period (Fig. 3). Occlusion of the right eye for 6 hours a day was maintained postoperatively to prevent amblyopia. The best corrected visual acuity in the left eye was 0.025 (ETDRS line) 3.5 months postoperatively.

DISCUSSION

A knife, needle, glass, and a pair of scissors are among the most common agents that cause childhood penetrating eye injuries.[3,4] Trauma to the globe, or congenital causes result in loss or abnormalities of iris tissue, thereby abnormalities in the shape of pupilla. In many cases iris tissue crowds or retracts into the anterior chamber angle, or is encased in scar tissue.[5] All these usually require surgical intervention. The decision on how to repair the iris defect depends on the degree of iris lost. Miosis is required to form a centrally-located pupilla. Placing minimum 2 or 3 sutures that are made of 10-0 polypropylene material and with round-bodied needles on iris to hold it under tension or traction and leaving a small peripheral iris defect which will act as a peripheral iridotomy against probable pupil block glaucoma are suggested.[5] In the current case we formed the pupilla by the help of a vitrectom, and therefore, used no suture.

Our target in reconstructing the pupilla in the present case was to keep it in its place, prevent the peripheral anterior synechiae formation, form a well-functioning pupilla, and thus improve the cosmetic appearance.

Arundhati et al. described a novel surgical method of iris reconstruction.[5] They advanced the inferior pupil superiorly, with creation of a new pupil opening in the mid-periferial inferior iris in cases with severely updrawn pupils associated with significant iris tissue loss.[5]

Besides forming a new pupilla using the patient's own iris, artificial iris reconstruction lenses were implanted in combination with penetrating keratoplasty to treat acquired aniridia.[6] The authors reported reduced visual disturbances and improved aesthetic appearance in the eyes.[2] Postoperative anisocoria was not a good experience for the patients. They suggested a smaller pupilla and an iris portion larger in diameter would function better.[2]

In our present case, when compared with the early postoperative pupillary length, the newly-formed iris traction lines in the late postoperative period caused a 25% pupillary elongation parallel to the iris traction lines (Fig. 4). Therefore, we suggest that the pupilla being con-

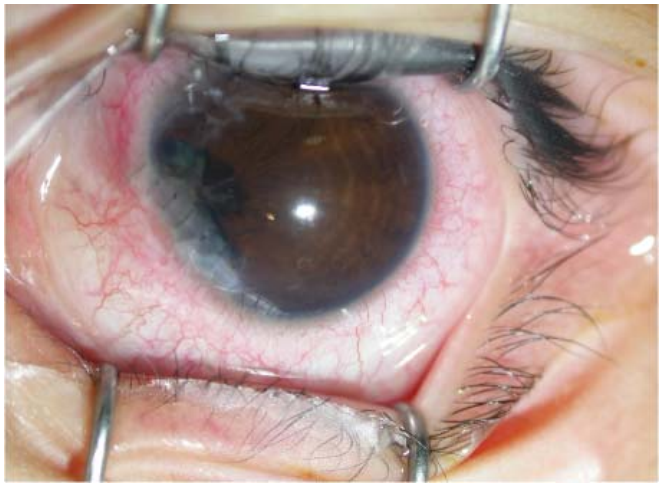

Figure 1: Appearance of the left eye of the patient with no visible pupilla prior to pupilloplasty.

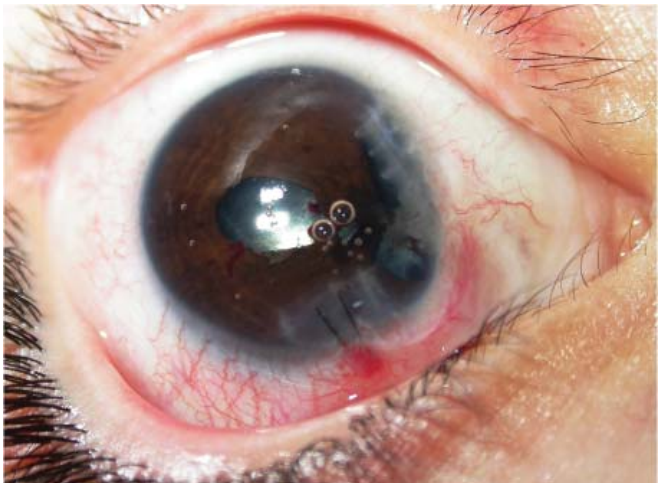

Figure 2: Appearance of the same eye with the newly formed central pupilla in the early postoperative period.

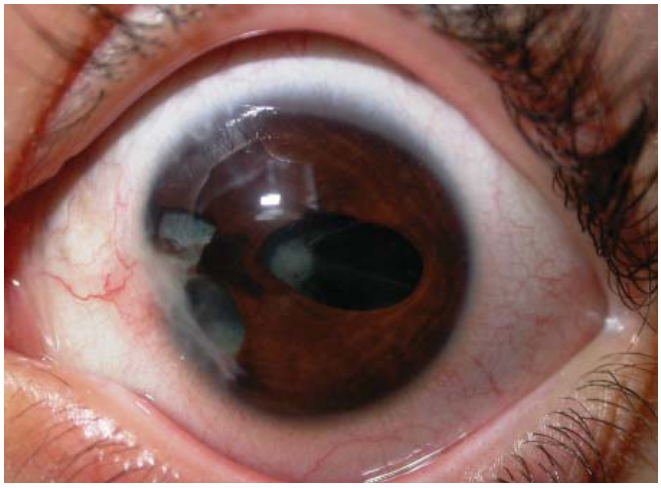

Figure 3: Appearance of the left eye in the late postoperative period.

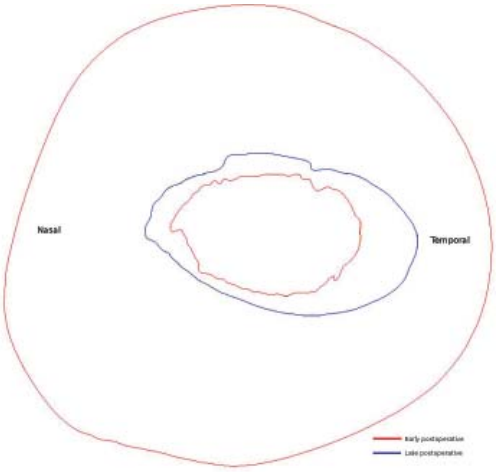

Figure 4: Shematic diagram of the borders of the newly formed pupilla early postoperatively (inner red lines) and late postoperatively (blue lines).

structed should be made a little smaller in length than the desired length. We also suggest to form a pupilla with an axis perpendicular to the traction lines to prevent the unusual shape of the pupilla and give it a round shape.

Besides, prevention of childhood penetrating eye injuries merits at least as much attention as treatment, because of the negative effects of such traumas on psychological and physical growing up of the child.

Overall, a timely and successful restoration of the pupilla regarding the shape it will probably gain postoperatively will decrease the complications that the problematic pupilla causes and help the individual keep the health of the whole eye.

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