Endoilluminator-assisted pediatric cataract surgery with hazy cornea

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The purpose of this study was to demonstrate the usefulness of endoilluminator in pediatric cataract with hazy corneas. We describe a series of three cases of pediatric cataract where visualization of intraocular structures was inadequate under the operating microscope. The endoilluminator was held at the limbus with light directed obliquely to visualize the details of intraocular structures against the hazy cornea using oblique illumination. It allowed structures behind the hazy cornea to be seen with ease. A simple modification in surgical procedure of pediatric cataract using an endoilluminator helps in better visualization of intraocular structures in difficult situations.

Key words: Endoilluminator, hazy cornea, oblique illumination, pediatric cataract

Pediatric cataract surgery is a challenging procedure in itself, and it becomes more difficult when encountered with hazy cornea. In cases of corneal haze, visualization of intraocular structures is difficult, and hence, procedures such as capsulorhexis and vitrectomy become even more challenging. Use of endoilluminator is described sparingly in anterior-segment surgeries. During anterior-segment surgeries complicated by hazy media, endoilluminator acts as an external light source enhancing visibility of the operating surgeon, aiding in smooth performance achieving better surgical outcome. Here, we describe three different pediatric cataract scenarios with hazy cornea, in which the technique of endoilluminator-assisted cataract surgery allowed the surgery to be performed with ease.

Case Reports

Case 1

A 3-year-old child presented with a history of needle injury to the left eye. Examination revealed a 4-mm full-thickness corneal tear involving the visual axis with lenticular material extruding through the tear, suggestive of the anterior capsular rupture [Fig. 1a]. After suturing the tear, a rent in the posterior capsule (PC) was noted and primary lens aspiration was therefore attempted. However, it could not be completed under the microscope light alone due to the associated corneal edema [Fig. 1b]. In view of this, the endoilluminator was held at the limbus with the light directed obliquely and the extent of the anterior capsular and PC dehiscence was clearly identified [Fig. 1c]. It also identified the presence of vitreous in the anterior chamber, for which vitrectomy was initiated first followed by careful aspiration of the lenticular material. The vitrector was then used to fashion the PC opening into an adequate size and complete the anterior vitrectomy (AV). Intraocular lens implantation was planned for the next sitting.

Case 2

A 6-month-old male child was referred to our department with white reflex in the right eye since birth. Examination revealed microcornea of 9 mm with a large anterior polar cataract adhered to the endothelium, suggestive of Peter's anomaly [Fig. 2a]. The left eye was essentially normal. Surgery was planned to clear the visual axis. The adhesions between the lenticular bag and endothelium became evident using the endoilluminator [Fig. 2b], which were not seen under the normal microscope light [Fig. 2c]. We could then proceed with cutting and peeling of the adhesions and rest of steps of lens aspiration and primary posterior capsulectecmy (PPC) with ease under direct visualization. At the end of the surgery, an adequate size of the PC opening could be achieved [Fig. 2d].

Case 3

An 8-year-old child came with blurring of vision in both eyes since 1 year. Slit-lamp examination revealed cataractous microspheric lens that had dislocated in the anterior chamber in both eyes [Fig. 3a], with corneal opacity secondary to adherence of the lens to the endothelium. The patient was taken up for a lensectomy in the left eye first. The cornea of the left eye also showed central leucomatous opacity [Fig. 3b] when seen with the endoilluminator that was not evident otherwise [Fig. 3a]. After making a nick in the anterior capsule, lens aspiration was performed using the endoilluminator, the capsular bag attached to the endothelium was peeled off using a microrhexis forceps [Fig. 3c], and an adequate AV was done to complete the procedure [Fig. 3d].

Discussion

Endoilluminator has been used as an oblique source of light during anterior-segment surgeries mainly for performing continuous curvilinear capsulorhexis in white cataract[1,2] and intumescent cataracts.[3] We have previously described the technique of using the endoilluminator[4] for better visualization

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Quick Response Code:

Website: www.ijo.in

DOI: 10.4103/ijo.IJO_1180_17

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Manuscript received: 16.01.18; Revision accepted: 27.04.18

Cite this article as: Matalia JH, Rajput VK, Matalia H, Shetty BK. Endoilluminator-assisted pediatric cataract surgery with hazy cornea. Indian J Ophthalmol 2018;66:1198-200.

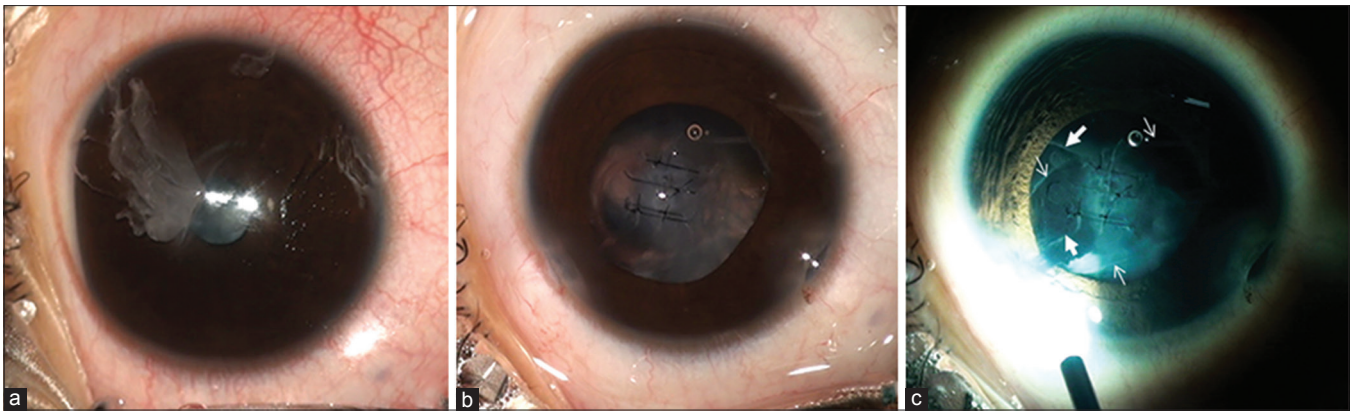

Figure 1: Intraoperative photograph; (a) extent of the corneal tear with extruding lenticular matter; (b) difficulty in intraocular visualization under microscopic light due to the corneal edema around the tear; (c) external endoillumination of anterior chamber enhancing the intraocular visibility delineating the extent of the anterior (thin arrow) and posterior capsular rupture (thick arrow)

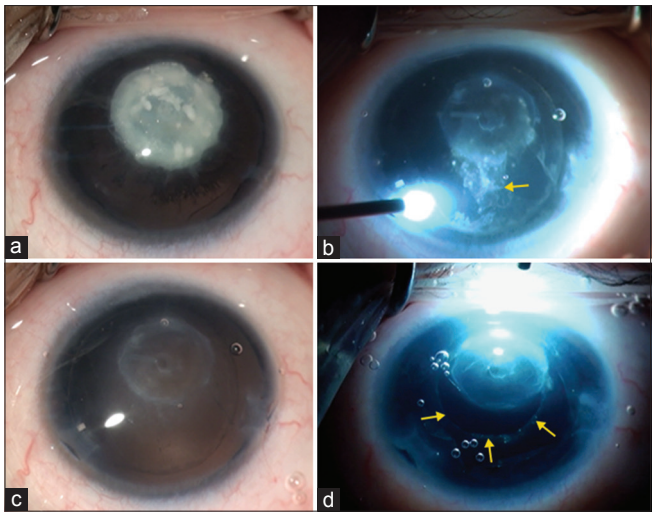

Figure 2: (a) Preoperative photograph showing the corneal opacity and cataractous changes in the lens; (b) intraoperative photograph after lens aspiration showing the keratolenticular adhesions (yellow arrow) clearly visible with endoilluminator, (c) no adhesions visualized under microscope light alone, (d) photograph at the end of surgery showing adequacy of primary posterior capsulectomy and anterior vitrectomy (yellow arrow) using endoilluminator

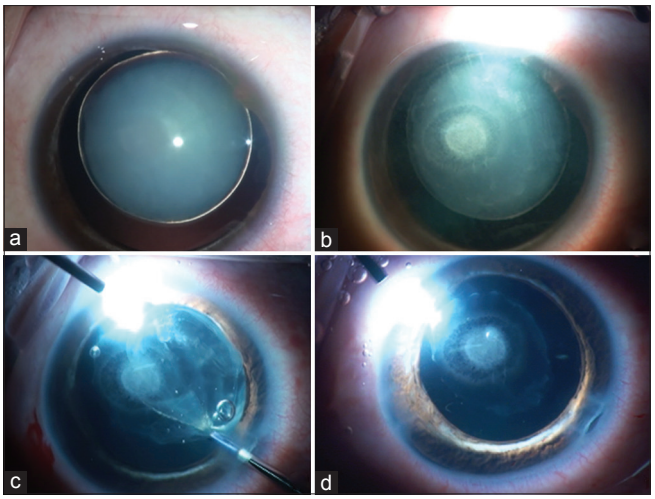

Figure 3: Preoperative photograph: (a) normally appearing cornea under microscope light, (b) central leucomatous opacity is clearly differentiated against the cataract using the oblique light of endoilluminator. Intraoperative photograph: (c) capsular bag attached to the endothelium is being peeled off using a microrhexis forceps, (d) immediate postoperative photograph of the eye

of the vitreous during AV. We have also reported the use of endoilluminator as an effective tool during pediatric cataract surgery in 76 eyes of 44 children for better visualization of the PC in performing adequate posterior capsulectomy and ensuring completeness of AV.[5] Endoilluminator works on the principle of oblique illumination, wherein the eye is directly seen under the microscope with the light of the microscope switched off and the endoilluminator being held at an angle more than 70°, externally along the limbus to illuminate the anterior-segment structures.

In this series, we describe its use in pediatric cataract surgery with associated corneal haze. In our first case, difficulty was encountered during the removal of cortical material that was admixed with the vitreous and in visualization of the extent of PC dehiscence. Intracameral triamcinolone can also assist to remove prolapsed vitreous but will not show extent of PC dehiscence and its use may not be without complications.[6,7] Similarly, in the second case with type II Peters anomaly with deficient endothelium and Descemet's membrane, the endoilluminator picked up the adhesions with the lens. The third case had cataract and glaucoma due to the dislocated microphakic lens in anterior chamber. The chronic endolenticular touch led to the development of corneal opacity in the center, hindering visualization of intraocular structures. It was the endoilluminator that came to our rescue in performing the surgery with ease.

Conclusion

Endoilluminator is a readily available tool that helps in better visualization of intraocular structures in difficult situations.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published

and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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