Repeated intraocular lens dislocation followed by haptic deformation and loss of tension: a case report

xinqi ma

Sun Yat-Sen University Zhongshan Ophthalmic Center

ming zhou

Sun Yat-Sen University Zhongshan Ophthalmic Center

jiatie wen

Sun Yat-Sen University Zhongshan Ophthalmic Center

yujia ouyang

Sun Yat-Sen University Zhongshan Ophthalmic Center

chongde long (✉ longchd@mail.sysu.edu.cn)

Sun Yat-Sen University Zhongshan Ophthalmic Center <https://orcid.org/0000-0002-2999-0330>

Case report

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Abstract

Background: Intraocular lens (IOL) dislocation is a rare but serious postoperative complication of intraocular lens implantation, so far, there is no report describing late intraocular lens dislocation caused by a deformed haptic piercing through the iris.

Case report: A 29-year-old male developed IOL dislocation one and a half years after IOL implantation in his right eye. The eye examination showed that haptic pierced the iris at 10 o'clock in his right eye, according to intraoperative exploration, the haptic was deformed and became less elastic, the patient underwent the surgery of IOL reposition for various factors, but finally did not achieve a satisfactory outcome.

Conclusion: Late IOL dislocation followed by haptic deformation is difficult to detect unless there are serious complications. When the position of IOL haptics is not in a plane with its optical surface, it should be highly vigilant that the function of the haptics may be abnormal. IOL replacement should be performed as soon as possible for the IOL dislocation caused by the loss of haptic tension.

Background

Intraocular lens dislocation is a rare but serious postoperative complication of IOL implantation, which can seriously affect visual acuity and lead to bad prognosis of surgery. The cases of IOL dislocation are reported more frequently in recent years with the growing community of patients who has undergone cataract surgery¹. The early IOL dislocation often occurs due to improper IOL fixation and intraoperative complications and late dislocation occurs three months or later after surgery as a result of progressive zonular weakness, capsular contraction syndrome, physical labor that causes high intraocular pressure and trauma². The surgical treatment of patients with IOL dislocation includes IOL reposition and IOL replacement, but the optimal management for IOL dislocation need to be considered comprehensively³. To the best of our knowledge, this is the first study to report late IOL dislocation caused by a deformed haptic piercing through the iris. We report a case of late IOL dislocation caused by loss of haptic tension. In this case, the surgeon combined various factors and tried to adjust the position of the intraocular lens, but finally did not achieve a satisfactory outcome. This case provides experience and lessons for the choice of intraocular lens dislocation.

Case Presentation

A 29-year-old man was admitted to our clinic with aphakia in his right eye on October 27, 2016. He had undergone pars plana vitrectomy and lensectomy for ocular trauma in his right eye one year earlier, and in that operation, his anterior capsule of lens was preserved for secondary IOL implantation. His preoperative uncorrected visual acuity (UCVA) was 1.6 logarithm of the minimum angle of resolution (logMAR) units in the right eye, and the best-corrected visual acuity (BCVA) was 0.05 logMAR unit. In the secondary IOL implantation, a 3-piece hydrophobic acrylic IOL (AR40e, AMO) was implanted in his right

eye and the two haptics were adjusted to 3 and 9 o'clock positions. No obvious postoperative complication occurred on the first day after surgery.

One and a half years after IOL implantation, he was admitted with spontaneous vision loss accompanied by redness in the right eye. Upon eye examination, the UCVA of his right eye was 0.70 logMAR unit and the BCVA was not improved. There was a series of eye signs of conjunctival congestion, edema of corneal inferior temporal, anterior chamber flare, iris depigmentation at 6 o'clock, IOL dislocation to the temporal side and haptic piercing the iris at 10 o'clock in his right eye (Fig. 1). Clinical specular microscope (CSM) showed that the endothelial cell density was reduced to 1140 cells/mm² in his right eye. According to intraoperative exploration, the haptic piercing the iris was found becoming less elastic so that it could hardly support the IOL steadily. But for the reason that he refused to replace the intraocular lens, he had undergone IOL reposition eventually and the haptic of poor tension was adjusted to the position of 1 o'clock. The examination on the first day after operation showed that there were symptoms of conjunctival congestion, edema of corneal, weakly positive anterior chamber flare in his right eye (Fig. 2), his postoperative UCVA was 1.10 logMAR units and the BCVA was not improved.

One month after surgery, the patient presented for a follow-up examination and IOL dislocation was found again with no cause or discomfort of patient. His UCVA was 1.10 logMAR units and the BCVA was 1.0 logMAR unit, the haptic could be seen to lift the iris at 1 to 2 o'clock, his IOL was displaced to the 1 o'clock and the edge of IOL was visible in the pupil area when the pupil diameter was 4–5 mm (Fig. 3). Ultrasound biological microscope (UBM) showed there was an abnormal echo of IOL haptic behind the iris at 1 to 2 o'clock in his right eye and there was no fracture or relaxation of the zonular fibers (Fig. 4), CSM examination showed the cell density was 1208 cells/mm² in his right eye. He was not willing to accept surgery again, and his BCVA of regular follow-up was 1.0 logMAR unit in his right eye.

Discussion

Intraocular lens (IOL) dislocation is one of the complications after cataract extraction with intraocular lens implantation. Although occurring rarely, it seriously affects the vision of patients⁴. A recent observational study showed that the cumulative IOL dislocation risk at 5,10,15,20, and 25 years after cataract extraction was 0.1%, 0.1%, 0.2%, 0.7%, and 1.7%, respectively⁵. Causes of IOL dislocation include trauma, iatrogenic IOL injury, progressive weakness of Zonule of Zinn, capsular contraction syndrome, and physical labor that causes elevated intraocular pressure. Among them, injury of IOL haptics is one of the essential reason of IOL dislocation⁶. First, it mainly includes haptic fracture and haptic deformation. The cause of haptic fracture is relatively clear, which is often caused by extraocular forces such as trauma, YAG laser or iatrogenic operation⁷⁻⁹. The fractured haptic drive the artificial lens to lose its positional stability, so that IOL eccentricity, deviation and tilting occur in the early stage, making patients susceptible to their visual acuity. The treatment is to perform IOL replacement as early as possible, at the same time, the fractured haptic should be taken out as an intraocular foreign body. Early detection and clear treatment grant the patients the privilege to get timely treatment; however, the cause of haptic deformation may be

extraocular force or may be intraocular force, such as capsular contraction syndrome⁷. The tension of the deformed haptic may remain or may be lost. In the case of IOL dislocation caused by haptic deformation, the retention of IOL depends on multiple factors, such as the IOL condition and degree of IOL dislocation as well as the integrity of the capsule, function of the Zonule of Zinn and the intraoperative condition. In this case, although the dislocated intraocular lens is structurally intact, the haptic has lost some of its tension, driving it to break away from the ciliary sulcus; the tip of the haptics repeatedly rubs against the iris, eventually piercing the iris, damaging the corneal endothelium, and causing corneal edema. When the patient came to our hospital for treatment, corneal endothelium had already been damaged, and surgery should be considered as soon as possible.

Both intraocular lens reposition and intraocular lens replacement are safe and effective methods for the treatment of IOL dislocation¹⁰. A large sample of meta-analysis showed that neither of these methods had a significant effect on postoperative visual acuity and did not increase the risk of re-dislocation of IOL. After the operation of intraocular lens reposition, the incidence of anterior vitrectomy and cystoid macular edema is potentially lower than that of intraocular lens replacement, and in most cases, the incision of intraocular lens reposition is smaller than that of intraocular lens replacement; As for intraocular lens replacement, the advantage is to provide opportunities for re-correction in patients who are not satisfied with last postoperative vision correction³. Therefore, in the case of complete intraocular lens, capsular bag and good function of the Zonule of Zinn, intraocular lens reposition is a suitable choice for patients with satisfactory visual acuity after intraocular lens implantation. In this case, the patient's anterior lens capsule is intact, the function of the Zonule of Zinn is normal, and IOL is still structurally intact, but one haptic has already pierced the iris, indicating that its tension and memory have been damaged, and the treatment and operation of this condition has not been reported in the literature. In this case, the patient refused to replace IOL due to economic conditions, so the intraocular lens reposition was selected, and the lens haptic was returned to the ciliary sulcus during the operation. The intraocular lens was still able to maintain the suitable position during the operation. However, the dislocation of the intraocular lens inevitably occurred one month after the operation, because the tension distribution of the damaged haptic is not in the same plane as the crystal optical surface, which makes it unable to stably support the IOL, so still causes the haptic to escape the ciliary sulcus. After 16 months of intraocular lens reposition, the patient's visual acuity was stable and no other discomfort was felt. However, after 1 month of operation, the IOL haptic had already risen to the iris, and the iris was yet damaged by chronic friction. The long-term complications do not rule out uveitis, glaucoma, IOL re-dislocation and corneal decompensation.

Conclusion

This case suggests that in the choice of surgical procedure, intraocular lens replacement should be performed as soon as possible for the IOL dislocation caused by the loss of haptic tension. When the position of IOL haptics is not in a plane with its optical surface, it should be highly vigilant that the function of the haptics may be abnormal and the tension may be lost. In this case, the reason for the

tension loss of the lens haptic may be that the haptic is damaged during the folding or bolus injection of the IOL or during the operation. This situation is more difficult to detect than the haptic fracture, so it should be carefully examined when IOL is implanted in order to avoid this happening from the source.

Abbreviations

IOL: intraocular lens; UCVA: uncorrected visual acuity; logMAR: logarithm of the minimum angle of resolution; CSM: Clinical specular microscope; UBM: Ultrasound biological microscope.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable requests.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

All authors made substantial contributions to acquisition of data, or analysis and interpretation of data; Xinqi Ma and Ming Zhou were involved in drafting the manuscript, Chongde Long revised it critically for important intellectual content and gave final approval to the version to be published. All authors read and approved the final manuscript.

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Figures

Figure 1

The slit-lamp examination before IOL reposition revealed that the haptic punctured the iris at 10 o'clock, and IOL shifted to the temporal side.

Figure 2

The slit-lamp showed anterior segment photography on the first postoperative day of IOL reposition.

Figure 3

Right Eye examination One month after IOL reposition. (a-d) The haptic could be seen to lift the iris, the IOL was displaced to the upper part of the nose, the IOL equator was visible in the pupil area, and the iris

rupture was located at 12 o'clock. (e and f) UBM examination showed that the iris was lifted at 1-2 o'clock, and IOL was displaced.