Lens Dislocation Due to Family Violence

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Abstract

**Purpose** To report dislocation of the lens or intraocular lens (IOL) caused by family violence, a social problem that is increasing worldwide.

**Methods** Retrospective case series. We investigated the medical records of 43 consecutive eyes of 41 cases with lens or IOL dislocation that underwent surgery at our hospital. Of all eyes, 4 eyes of 3 cases were caused by family violence.

**Results** Case 1. A 70-year-old female with narrow anterior chamber and high intraocular pressure in her left eye due to lens dislocation was referred to our hospital after her husband had beaten her with a fist. She explained to the previous doctor that she had hit her eye by herself.

Case 2. A 99-year-old female with in-the-bag IOL dislocation in her left eye 10 years after receiving cataract surgery was referred to our hospital. The following year, she was referred to our hospital because the same incident occurred in her right eye. She explained to the previous doctor that she had fallen, but was found to be due to family violence.

Case 3. A 62-year-old female suffered dislocation of an IOL inserted in her left eye 10 years previously. She also presented with a mature cataract in the right eye. While her explanation to the referring doctor was that she tumbled and fell, further inquiry revealed family violence to be the cause.

**Conclusion** Lens dislocation may be caused by family violence despite a conflicting initial clinical history.

Background

Incidence of intraocular lens (IOL) dislocation is increasing along with the number of cataract surgery performed each year [1]. The cumulative risk of IOL dislocation is increasing yearly after cataract extraction in a population-based cohort [2, 3]. Differential diagnosis and causes of lens or IOL dislocation includes various ocular and systemic diseases. These include pseudo exfoliation syndrome, trauma, high myopia, pigmentary retinal dystrophy, medical history of vitrectomy, atopic dermatitis, ciliary zonule fragility [4–9]. Among them, trauma is often ranked relatively high in reported studies (5.3–21.6%) [10, 4, 1, 6, 7, 9]. However, there are few reports with details of the cause of trauma and lens or IOL dislocation.

On the other hand, there are a few reports of lens or IOL dislocation due to family violence [11, 12]. Family violence includes domestic violence, child abuse and elder abuse. The victims of family violence are increasing yearly around the world because cases are becoming more recognized [13]. Therefore, for example, Family Violence Prevention and Services Act was enacted since 1984 in the United States. The United Nations General Assembly in 1993 adopted the Declaration on the Elimination of Violence against Women. Like many other countries, the Act on the Prevention of Spousal Violence and the Protection of Victims and the Elderly Abuse Prevention Law was enforced in 2001 and 2006 in Japan.
The purpose of this study is to report details on cases of lens or IOL dislocation caused by family violence.

**Methods**

This is a retrospective, observational study conducted in a single center. The Institutional Review Board of Jichi Medical University approved this study, and the study protocol adhered to the tenets of the Declaration of Helsinki. Consecutive eyes with lens or IOL dislocation that underwent surgery at our hospital between April 2014 and November 2018 were included. Cases of dislocation within 1 month after cataract surgery were excluded.

The medical charts of all included patients were reviewed. The patients had undergone comprehensive ophthalmologic examinations at our hospital including best-corrected visual acuity (BCVA), intraocular pressure (IOP), slit-lamp examination and dilated ophthalmoscopy. In addition, we recorded clinical course including detailed inquiry from medical records. BCVA was measured with a 5-meter Snellen chart. IOP was measured with a non-contact tonometer (NT-4000, Nidek, Tokyo).

**Results**

Forty-three eyes of 41 patients (23 male and 18 female) were included. The causes of lens or IOL dislocation are shown in Table 1. Four eyes among the 43 eyes were caused by family violence (9%). We report these 4 eyes of 3 patients.

| Causes                  | eyes / cases (%) |
|-------------------------|------------------|
| Trauma (all)            | 12 / 11 (28)     |
| Trauma (Normal trauma)  | 8 / 8 (19)       |
| Trauma (Family violence)| 4 / 3 (9)        |
| Fragile ciliary zonule  | 6 / 6 (14)       |
| High myopia             | 6 / 6 (14)       |
| Pseudo-exfoliation      | 6 / 6 (14)       |
| Post vitrectomy         | 8 / 8 (19)       |
| Unknown                 | 5 / 4 (11)       |

**Case 1**
Patient 1 is a 70-year-old female who was referred to us as closure angle glaucoma because of narrow anterior chamber and high intraocular pressure in her left eye (Fig. 1a). She explained to a previous doctor that her elbow had struck her left eye and she had monocular diplopia in her left eye one week after the incidence. Her BCVA was 0.5, and her IOP was 34mmHg in her left eye. In addition, the refraction of her left eye was more myopic (-3.0 Diopter) than her right eye (-0.75 Diopter). After mydriasis, we found that the narrow anterior chamber was due to lens dislocation (Fig. 1b). Therefore, we underwent her interview again in detail when her husband was not present. Finally, she explained that her husband beat her left eye 8 months ago and had hit her left eye again 2 weeks ago. She was treated by the previous doctor as subconjunctival hemorrhage and iritis of unknown cause after the first beating. After she became aware of double vision 1 week after the second beating, she consulted the same doctor again. We promptly performed phacoemulsification and aspiration, IOL suture, and vitrectomy. The eye has been stable since then, and we reintroduced her to the former doctor after 1-month follow up. However, 1 year later, she was introduced to us again with increased intraocular pressure and iritis. The iritis was not considered traumatic, because it could be controlled by steroid eye drops. However, we could not stop the steroid eye drops because of recurrence. Intraocular pressure was finally controlled within the normal range by using three types of anti-glaucoma instillation. Her BCVA in the left eye was 1.2 and IOP was 16mmHg at last visit.

Case 2

Patient 2 is a 99-year-old female who was referred to us with complete in-the-bag IOL dislocation into the vitreous cavity in her left eye after she fell, according to her family’s explanation (Fig.1c). She underwent cataract surgery in both eyes when she was 89 years old. We performed IOL removal, IOL suture, and vitrectomy immediately. At the postoperative outpatient clinic, there was a bruise in the eyelid and forehead of the patient, and elder abuse was discovered after a detailed interview with the key person, her granddaughter. Approximately 1 year later, she was referred to us with in-the-bag IOL dislocation in her right eye (Fig. 1d). Her family explained that one of the family members may have hit her near the eye a few days ago. We performed IOL removal, IOL suture, and vitrectomy immediately. Both eyes showed a good prognosis. Her BCVA was 0.15 in right eye and 0.4 in left eye, her IOP was 9mmHg in both eyes at last visit.

Case 3

Patient 3 is a 62-year-old female who was referred to us with a mature cataract in her right eye and complete in-the-bag IOL dislocation into the vitreous cavity in her left eye (Fig. 1e, f). She received cataract surgery in her left eye 10 years prior. Her visual acuity had declined after her husband hit her left eye, but she explained to the previous doctor that she had fallen down. When we asked them again what the real reason was, since it was important to choose a treatment policy, her husband confessed to the beating. Her BCVA was light perception in her right eye and 1.2 with +6.5 Diopter in her left eye. Her IOP was 13mmHg in both eyes. We performed IOL removal, IOL suture, and vitrectomy in her left eye immediately, and phacoemulsification with IOL implantation in her right eye 1 week after the left eye
surgery. Both eyes showed good course. Her BCVA was 1.2 in both eyes and IOP was 14mmHg and 13mmHg in her right and left eye at last visit.

**Discussion**

We described 3 patients with IOL or lens dislocation that could be clearly determined to be due to family violence. Differential diagnosis of lens or IOL dislocation includes various ocular and systemic diseases. Trauma is known as one of the main causes of lens or IOL dislocation. However, pseudo-exfoliation (PE) was reported to be more associated with IOL dislocation [3]. In our case series, although the number of cases is small, there were more traumatic cases (28%) and less PE cases (14%) compared to previous reports [4, 6, 7, 9].

The proportion of males in all IOL dislocation cases was 56% in this study, but all IOL dislocation cases related to family violence were female. There are many reports that males are more common in IOL dislocation cases [10, 4, 5, 1, 7, 9]. When combined with this study and the previous reports, family violence-related IOL or lens dislocation cases were 1 male and 4 females [11, 12]. It is noteworthy that family violence-related IOL dislocation is clearly higher in females at 80%. Generally, females are more prone to become victims of family violence [14, 15]. Thus, as shown in the current case series, female IOL dislocation cases without obvious risk factors for IOL dislocation should be considered to be possibly due to family violence.

All IOL dislocation cases in this study were in-the-bag IOL cases. The number of in-the-bag IOL dislocations has been increasing recently, with an incidence of 0.05-3.0% in previous reports [2, 1, 16–18, 3, 19–21]. Due to the limitation of our study, we could not determine the incidence of in-the-bag IOL dislocations. Possible predisposing factors for in-the-bag IOL dislocation were reported to be pseudoexfoliation, retinitis pigmentosa, a history of vitrectomy, ocular trauma, and a long axis [7]. Some of these traumas reported in late IOL dislocations may contain family violence cases.

The patients in this study did not complain of family violence voluntarily at first visit. In addition, all of our cases were not recognized as family violence victims at the initial examination in former clinics. Patients tend to hide the fact that they are victims of family violence [22]. There are some reports that most abused women did not volunteer a history of violence even to their regular clinicians [23, 24]. Doctors lack knowledge about family violence and lack of education for how to deal with family violence [25]. Our cases may only be the tip of the iceberg. In some cases, it is necessary to avoid family attendance and take a detailed interview.

Case 2 raised an important issue. We could not avoid IOL dislocation occurring in the fellow eye 1 year after IOL dislocation in her left eye. In fact, it is difficult for ophthalmologists alone to deal with family violence. To prevent the recurrence, when an ophthalmologist diagnoses family violence, it may be better to work in partnership with a specialized team of family violence.
On the other hand, the most common sites of injury due to family violence were reported to be the eyes, the side of the face, and the throat or neck [26]. Of ocular injuries in battered women, 86% were result of a punch with a closed fist, and orbital fracture, ruptured globe and traumatic hyphema were reported as serious injuries [27]. Family violence and sexual assault were reported as frequent cause of orbital fractures among women [28]. This study revealed that family violence against women may cause IOL dislocation. Further studies in a larger number of cases are necessary to clarify actual conditions of eye injury due to family violence.

Conclusions

Family violence should be considered as a cause of lens dislocation despite a conflicting initial clinical history. Detailed inquiry is required to discover the victims of family violence.

Declarations

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Conflicts of interest

The authors declare that they have no conflict of interest.

Availability of data and material

The data that support the findings of the present study are available from the corresponding author on reasonable request.

Author's contributions

MST and HT contributed to the conception of the work. YT and RT searched the literature and extracted the data. MST and AK wrote the manuscript. TK revised the manuscript and produced the final version. All authors read and approved the final manuscript.

Ethics approval

This retrospective case series was approved by the Institutional Review Board of Jichi Medical University and followed the tenets of the Declaration of Helsinki.

Informed consent

Informed consent was obtained from all individual participants included in the study.

References
1. Gimbel HV, Condon GP, Kohnen T, Olson RJ, Halkiadakis I (2005) Late in-the-bag intraocular lens dislocation: incidence, prevention, and management. J Cataract Refract Surg 31:2193-204. doi:10.1016/j.jcrs.2005.06.053.

2. Dabrowska-Kloda K, Kloda T, Boudiaf S, Jakobsson G, Stenevi U (2015) Incidence and risk factors of late in-the-bag intraocular lens dislocation: evaluation of 140 eyes between 1992 and 2012. J Cataract Refract Surg 41:1376-82. doi:10.1016/j.jcrs.2014.10.040.

3. Pueringer SL, Hodge DO, Erie JC (2011) Risk of late intraocular lens dislocation after cataract surgery, 1980-2009: a population-based study. Am J Ophthalmol 152:618-23. doi:10.1016/j.ajo.2011.03.009.

4. Fernández-Buenaga R, Alio JL, Pérez-Ardoy AL, Larrosa-Quesada A, Pinilla-Cortés L, Barraquer R et al. (2013) Late in-the-bag intraocular lens dislocation requiring explantation: risk factors and outcomes. Eye (Lond) 27:795-801; quiz 2. doi:10.1038/eye.2013.95.

5. Fujikawa A, Mohamed YH, Kinoshita H, Tsuiki E, Kitaoka T (2018) Spontaneous dislocation of the posterior chamber intraocular lens. Int Ophthalmol 38:1111-7. doi:10.1007/s10792-017-0567-6.

6. Gross JG, Kokame GT, Weinberg DV, Group DI-T-BILS (2004) In-the-bag intraocular lens dislocation. Am J Ophthalmol 137:630-5. doi:10.1016/j.ajo.2003.10.037.

7. Hayashi K, Hirata A, Hayashi H (2007) Possible predisposing factors for in-the-bag and out-of-the-bag intraocular lens dislocation and outcomes of intraocular lens exchange surgery. Ophthalmology 114:969-75. doi:10.1016/j.ophtha.2006.09.017.

8. Kim SS, Smiddy WE, Feuer W, Shi W (2008) Management of dislocated intraocular lenses. Ophthalmology 115:1699-704. doi:10.1016/j.ophtha.2008.04.016.

9. Krėpštė L, Kuzmienė L, Miliauskas A, Janulevičienė I (2013) Possible predisposing factors for late intraocular lens dislocation after routine cataract surgery. Medicina (Kaunas) 49:229-34.

10. Ascaso FJ, Huerva V, Grzybowski A (2015) Epidemiology, Etiology, and Prevention of Late IOL-Capsular Bag Complex Dislocation: Review of the Literature. J Ophthalmol 2015:805706. doi:10.1155/2015/805706.

11. Georgalas I, Ladas I, Papacostantinou D, Taliatzis S, Koutsandrea C (2012) Management of crystalline lens dislocation into the anterior chamber in a victim of domestic violence. Clin Exp Optom 95:113-5. doi:10.1111/j.1444-0938.2011.00637.x.

12. Mutoh T, Tien T, Horie M, Matsumoto Y, Chikuda M (2012) Case of bilateral complete posterior dislocation of lens caused by elder abuse. Clin Ophthalmol 6:261-3. doi:10.2147/opth.S28990.

13. Carrillo R (2002) Overview of international human rights standards and other agreements and responses of the judicial system to violence against women. Int J Gynaecol Obstet 78 Suppl 1:S15-20. doi:10.1016/s0020-7292(02)00039-5.

14. Sheridan DJ, Nash KR (2007) Acute injury patterns of intimate partner violence victims. Trauma Violence Abuse 8:281-9. doi:10.1177/1524838007303504.

15. Uno H, Ui S, Aoyama A (2004) [Domestic violence–public health perspectives]. Nihon Koshu Eisei Zasshi 51:305-10.
16. Jakobsson G, Zetterberg M, Sundelin K, Stenevi U (2013) Surgical repositioning of intraocular lenses after late dislocation: complications, effect on intraocular pressure, and visual outcomes. J Cataract Refract Surg 39:1879-85. doi:10.1016/j.jcrs.2013.06.023.

17. Mello MO, Scott IU, Smiddy WE, Flynn HW, Feuer W (2000) Surgical management and outcomes of dislocated intraocular lenses. Ophthalmology 107:62-7. doi:10.1016/s0161-6420(99)00017-2.

18. Mönestam EI (2009) Incidence of dislocation of intraocular lenses and pseudophakodonesis 10 years after cataract surgery. Ophthalmology 116:2315-20. doi:10.1016/j.ophtha.2009.05.015.

19. Smiddy WE, Ibanez GV, Alfonso E, Flynn HW (1995) Surgical management of dislocated intraocular lenses. J Cataract Refract Surg 21:64-9. doi:10.1016/s0886-3350(13)80482-8.

20. Smith SG, Lindstrom RL (1985) Malpositioned posterior chamber lenses: etiology, prevention, and management. J Am Intraocul Implant Soc 11:584-91. doi:10.1016/s0146-2776(85)80139-7.

21. Stark WJ, Maumenee AE, Datiles M, Fagadau W, Baker CC, Worthen D et al. (1983) Intraocular lenses: complications and visual results. Trans Am Ophthaml Soc 81:280-309.

22. Rhodes KV, Levinson W (2003) Interventions for intimate partner violence against women: clinical applications. JAMA 289:601-5. doi:10.1001/jama.289.5.601.

23. Caralis PV, Musialowski R (1997) Women's experiences with domestic violence and their attitudes and expectations regarding medical care of abuse victims. South Med J 90:1075-80. doi:10.1097/00007611-199711000-00003.

24. McCauley J, Yurk RA, Jenckes MW, Ford DE (1998) Inside "Pandora's box": abused women's experiences with clinicians and health services. J Gen Intern Med 13:549-55. doi:10.1046/j.1525-1497.1998.00166.x.

25. Physicians and domestic violence. Ethical considerations. Council on Ethical and Judicial Affairs, American Medical Association. (1992) JAMA 267:3190-3.

26. Reijnders UJ, van der Leden ME, de Bruin KH (2006) [Injuries due to domestic violence against women: sites on the body, types of injury and the methods of infliction]. Ned Tijdschr Geneeskd 150:429-35.

27. Beck SR, Freitag SL, Singer N (1996) Ocular injuries in battered women. Ophthalmology 103:148-51. doi:10.1016/s0161-6420(96)30748-3.

28. Hartzell KN, Botek AA, Goldberg SH (1996) Orbital fractures in women due to sexual assault and domestic violence. Ophthalmology 103:953-7. doi:10.1016/s0161-6420(96)30580-0.