

Spontaneous levitation of dropped nucleus on first post-operative day

SAGE Open Medical Case Reports
Volume 5: 1–3
© The Author(s) 2017
Reprints and permissions:
sagepub.co.uk/journalsPermissions.nav
DOI: 10.1177/2050313X17708713
journals.sagepub.com/home/sco



Mayuresh P Naik, Harindersingh Sethi, Anuj Mehta, Abhinav Bhalla and Komal Saluja

Abstract

A 60-year-old male patient presenting with gradual painless progressive diminution of vision was diagnosed with nuclear sclerosis grade III (LOCS). Intra-operatively, there was a nuclear drop into the vitreous cavity. The patient was left aphakic and was deferred for further vitreoretinal procedure the next day. On first post-op day, the nucleus fragment (of roughly the same size that had dropped into the vitreous) was seen in the anterior chamber. A gentle ultrasonography B-Scan done for posterior segment evaluation was anechoic. Incision was enlarged and viscoexpression of the nucleus fragment was done followed by thorough anterior vitrectomy. Post-operatively, dilated full fundus examination showed clear vitreous cavity without any evidence of retinal tear or detachment. This was later confirmed by an anechoic ultrasonography B-Scan. After 2 weeks, three-piece foldable IOL was placed in the sulcus with posterior optic capture and the patient attained a best-corrected visual acuity of 6/9P.

Keywords

Nucleus drop, vitrectomy

Date received: 17 November 2016; accepted: 12 April 2017

Case report

A 60-year-old male patient presenting with gradual painless progressive diminution of vision had best-corrected visual acuity (BCVA) 6/60 in both eyes. Anterior segment examination was unremarkable. Pre-operative evaluation revealed a well-dilating pupil with no evidence of any pseudo-exfoliative material neither any iridodonesis-phacodonesis nor any subluxation. Lens had nuclear sclerosis grade III (lens opacification classification system [LOCS]).

Intra-operatively, after a 5.5-mm capsulorhexis, hydro-dissection-hydrodelineation was done. After introducing the phaco probe into the anterior chamber, as soon as phacoemulsification was started (flow rate 22 mL/min, vacuum 50 mmHg, power 65%) and anterior surface of the nucleus was touched, there was sudden deepening of the anterior chamber followed by nuclear drop into the vitreous cavity. Probe was withdrawn while simultaneously injecting a dispersive ophthalmic viscosurgical device (OVD) via sideport into the anterior chamber. A linear posterior capsular tear was noticed and plugged with dispersive OVD. The remnant nuclear piece was safely emulsified followed by thorough anterior vitrectomy (cut rate 4000/s, vacuum 200 mmHg, aspiration 25 mL/min). After careful irrigation-aspiration of

remnant cortex, patient was left aphakic and was deferred for further vitreoretinal procedure the next day.

On first post-op day, the nucleus fragment (of roughly the same size that had dropped into the vitreous) was seen to be floating in the anterior chamber in entirety (Figure 1). A gentle ultrasonography (USG) B-Scan done for posterior segment evaluation was anechoic. Eyedrop pilocarpine 2% was instilled and the patient was taken back into the operating room. Incision was enlarged and viscoexpression of the nucleus fragment was done. Thorough anterior vitrectomy (cut rate 4000/s, vacuum 250 mmHg, aspiration 25 mL/min) was repeated and wound was closed with three interrupted 10-0 nylon sutures (Figure 2).

Department of Ophthalmology, Vardhman Mahavir Medical College & Safdarjung Hospital, New Delhi, India

Corresponding Author:

Mayuresh P Naik, Department of Ophthalmology, Vardhman Mahavir Medical College & Safdarjung Hospital, Room No. 430 of Eye OPD, 4th Floor of OPD Building, Ansari Nagar, Ring Road, New Delhi 110 029, India.

Email: mayureshpnaik@gmail.com





Figure 1. Spontaneous levitation of dropped nuclear fragment on first post-op day.

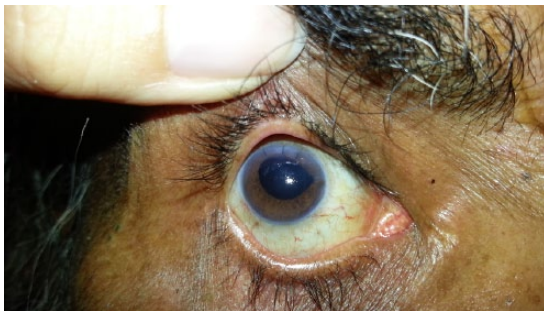


Figure 2. Post-op status after viscoexpression and thorough anterior vitrectomy.

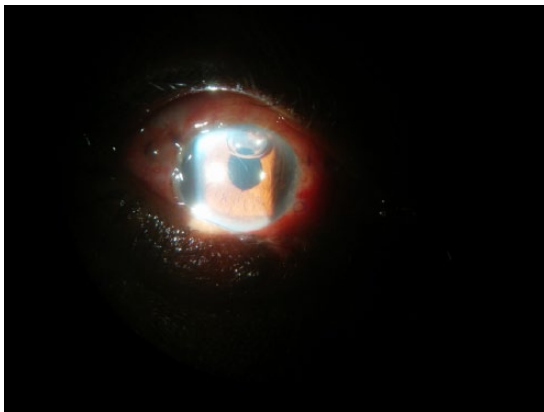


Figure 3. Final status of patient after insertion of three-piece foldable IOL in the sulcus with posterior optic capture.
IOL : Intracocular lens.

Post-operatively, dilated full fundus examination showed clear vitreous cavity without any evidence of retinal tear or detachment. This was later confirmed by an anechoic USG B-Scan. After 2 weeks, three-piece foldable IOL was placed in the sulcus with posterior optic capture and the patient attained a BCVA of 6/9P (Figure 3).

Discussion

A study in India reported the incidence of nucleus drop as being 0.3%–1.3%,¹ whereas in the United States, the incidence was found to be 0.3%.² The incidence of dropped

nucleus with experienced surgeons was 0.2% which was significantly less than that observed with inexperienced surgeons 0.6%.¹ Once a surgeon recognizes posterior capsule rupture, the aim of the surgeon is to remove the remaining nucleus, epinucleus and cortex safely, followed by excision of vitreous from the anterior chamber using an automated vitreous cutter with a high cutting rate. If the nucleus dislocates into the posterior vitreous or onto the retina, the surgeon needs to control his nerves and avoid unplanned unnecessary maneuvers. An experienced vitreoretinal surgeon should be consulted at this point.

It is difficult to discernify the cause of the posterior capsular rupture (PCR) in such cases wherein the PCR occurs almost at the start of phacoemulsification. Vigorous hydrodissection in the presence of a small capsulorhexis may lead to a PCR and subsequent nucleus drop as soon as the phaco probe dissipates its energy to the nucleus. Second, if the capsular bag may not have been decompressed off the hydrodissection fluid, possibility exists that the irrigation from the phaco probe may find its way between the capsule and the cortex; subsequently leading to a PCR that may not be detectable early enough to prevent complications. However, finally, in the presence of an adequate capsulorhexis with gentle yet sufficient hydrodissection and subsequent decompression of the capsular bag off the hydrodissecting fluid, an inadvertent PCR could be attributed to a weak posterior capsule. It could be postulated that the pressure of the hydrodissecting fluid within the capsular bag along with the energy dissipated by the phaco probe may force such a weak capsule to rupture as evidenced by sudden deepening of the anterior chamber with or without a nucleus fragment drop.

The timing of vitrectomy is a case of nucleus drop and has been a question of debate for a long time. Some studies have suggested that outcomes are better if pars plana vitrectomy (PPV) is performed within 2 weeks of nucleus drop.^{3,4} Chalam et al.⁵ conducted a retrospective, observational case study of patients who underwent “concurrent” PPV for dislocated lens fragments between the period 2000 and 2008. Their review suggested that concurrent PPV for retained lens fragments after cataract surgery is beneficial and may decrease the risk of glaucoma and prevent development of rhegmatogenous retinal detachment (RRD). Lai et al.,⁶ Chen et al.⁷ and Soliman Mahdy et al.⁸ also supported this view while reinstating that immediate vitrectomy in the same sitting of the cataract surgery is a surgical option in the management of dislocated intravitreal lens fragments when vitreoretinal support is available. Most patients achieve a good visual outcome with reduced risk of secondary glaucoma and cystoid macular edema after surgery. Even though a review by Falavarjani et al.⁹ showed a trend toward better visual results in the early intervention group (within 2 weeks of complicated cataract surgery), however, the difference was not statistically significant. They believed that timing for PPV depends on the patient’s clinical condition. This is in accordance with other studies demonstrating that timing of PPV is not significantly associated with visual outcomes.^{10,11}

Fortunately, in our patient, there was spontaneous levitation of the dropped nucleus fragment on the first post-operative day before the patient could be taken up inside the operating room for vitreoretinal surgery.

The reason for such spontaneous levitation of a dropped nuclear fragment is unfathomable. It is quite possible that during the vitrectomy and aspiration used after the posterior capsular rent, despite use of low-flow rate and use of dispersive OVD to plug the defect, some minimal amount of irrigating liquid seeps through the posterior capsular rent and thereby hydrates the vitreous gel. This hydrated vitreous gel sets up convection currents and may probably contribute to the spontaneous levitation of the nuclear fragment into the anterior chamber.

Thus, some studies suggest a concurrent PPV in the same sitting while some advise early PPV within 2 weeks. However, a deferring the vitreoretinal procedure to the next day has its own advantages. First, in the event that the nucleus drop occurred at the hands of an anterior segment surgeon, a better equipped vitreoretinal surgical team may be able to handle the drop in a better way. Second, there arises the problem of augmenting the peribulbar block in case it is decided to tackle the vitreoretinal procedure in the same sitting. And this is cumbersome in a hypotonous vitrectomized globe. Finally, in case of such a spontaneous levitation of a nuclear fragment, it may avoid a vitreoretinal procedure altogether.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship and/or publication of this article.

References

1. Mathai A and Thomas R. Incidence and management of posteriorly dislocated nuclear fragments following phacoemulsification. *Indian J Ophthalmol* 1999; 47: 173–176.
2. Smiddy WE. Management of dislocated foldable intraocular lenses. *Retina* 2005; 25: 576–580.
3. Yao K, Shentu X, Jiang J, et al. Phacofragmentation without perfluorocarbon liquid for dislocated crystalline lenses or lens fragments after phacoemulsification. *Eur J Ophthalmol* 2002; 12: 200–204.
4. Monshizadeh R, Samiy N and Haimovici R. Management of retained intravitreal lens fragments after cataract surgery. *Surv Ophthalmol* 1999; 43: 397–404.
5. Chalam KV, Murthy RK, Priluck JC, et al. Concurrent removal of intravitreal lens fragments after phacoemulsification with pars plana vitrectomy prevents development of retinal detachment. *Int J Ophthalmol* 2015; 8(1): 89–93.
6. Lai TY, Kwok AK, Yeung YS, et al. Immediate pars plana vitrectomy for dislocated intravitreal lens fragments during cataract surgery. *Eye* 2005; 19(11): 1157–1162.
7. Chen CL, Wang TY, Cheng JH, et al. Immediate pars plana vitrectomy improves outcome in retained intravitreal lens fragments after phacoemulsification. *Ophthalmologica* 2008; 222(4): 277–283.
8. Soliman Mahdy M, Eid MZ, Shalaby KA, et al. Intravitreal phacoemulsification with pars plana vitrectomy for management of posteriorly dislocated nucleus or lens fragments. *Eur J Ophthalmol* 2010; 20(1): 115–119.
9. Falavarjani KG, Hashemi M, Fazel AJ, et al. Pars plana vitrectomy and intravitreal phacoemulsification for dropped nuclei. *J Ophthalmic Vis Res* 2012; 7(2): 125–129.
10. Lambrou FH and Stewart MW. Management of dislocated lens fragments during phacoemulsification. *Ophthalmology* 1992; 99: 1260–1262.
11. Gilliland GD, Hutton WL and Fuller DG. Retained intravitreal lens fragments after cataract surgery. *Ophthalmology* 1992; 99: 1263–1267.