CASE REPORT

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Unusual Presentation of Extensive Visually Significant Pseudoexfoliative Deposits on an Intraocular Lens Implant in a Pseudophakic Eye: Insights and Implications

Abdelwahab Aleshawi¹, Mohammad Ali Al Qudah¹, Hamad Alazmi², Ahmed Al Sharie², Haya Sufyan Elnagar Jnr³, Hosni Alzoubi¹, Saad Almutairi², Seren Al Beiruti¹, Rami Al-Dwairi¹

¹Department of Special Surgery, Division of Ophthalmology, Faculty of Medicine, Jordan University of Science and Technology, Irbid, 22110, Jordan; ²Department of Ophthalmology, Ministry of Health, Kuwait City, 12009, Kuwait; ³Division of Ophthalmology, Department of Special Surgery, School of Medicine, The University of Jordan, Amman, 11942, Jordan

Correspondence: Abdelwahab Aleshawi; Rami Al-Dwairi, Department of Special Surgery, Division of Ophthalmology, Faculty of Medicine Jordan University of Science and Technology, P. O. Box: 3030, Irbid, 22110, Jordan, Tel +962795355056, Fax +962 2 7201064, Email abdelwahhabjamal@yahoo.com; ramialdwairi@yahoo.com

Objective: The aim of this report is to present a rare case of visually significant pseudoexfoliative deposition on an intraocular lens implant in a pseudophakic eye and describe the clinical characteristics, surgical approach, and histopathological characteristics.

Case Presentation: We present the case of a 61-year-old male with a history of cataract surgery in the left eye who presented with blurry vision bilaterally. Examination of the left eye revealed a centered posterior-chamber intraocular lens implant (IOL) with extensive, visually significant pseudoexfoliative plaques growing over the entire IOL. The decision was made to perform right eye phacoemulsification and IOL implantation and left eye IOL exchange. The tissue specimens were subsequently processed using the classical histological technique of paraffin embedding. Intraocular surgery improved the visual acuity from 6/30 in the left and 6/60 in the right eye to 6/6 in both eyes at 3 months postoperative. The extracted implant was examined under a microscope and showed amyloid-positive deposits.

Conclusion: This case highlights the importance of comprehensive examination for pseudoexfoliation, even in patients with pseudophakia. Visually significant PEX deposition was first reported and should be managed with caution.

Keywords: pseudoexfoliation syndrome, IOL, glaucoma, iris-claw implants

Introduction

Pseudoexfoliation syndrome (PEX) is an age-related systemic disease that primarily manifests in the lens capsule mainly and is characterized by the accumulation of microscopic granular amyloid-like protein fibers.^{1–3} PEX is the most common identifiable form of secondary open-angle glaucoma worldwide and is one of the most important predisposing factors for complicated cataract surgery.^{4,5} At presentation, approximately one-third of PEX syndrome cases are unilateral, whereas PEX complications are commonly bilateral.^{6–9}

PEX is a systemic deposition of fibrin-like material within the extracellular matrix-of virtually all anterior segment structures.⁸ It is related to a variety of ocular complications, such secondary open angle glaucoma (less commonly closure angle glaucoma), zonule instability, accelerated cataract formation, complicated cataract surgery, and endothelial corneal dysfunction.^{10,11} Depending on evidence from electron-microscopic and histochemical studies, PEX depositions supposed to be produced by the pre-equatorial lens epithelium, ciliary body epithelium, trabecular meshwork surface, corneal endotheliam, and vascular endothelial cells.¹¹ Deposition of PEX fibrillary material on the surface of an intraocular lens (IOL) is uncommon. Most of the previous reports described the development of PEX deposition on

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© 2025 Aleshawi et al. This work is published and licensed by Dove Medical Press Limited. The full terms of this license are available at https://www.dovepress.com/terms work you hereby accept the Terms. Non-commercial uses of the work are permitted without any further permission from Dove Medical Press Limited, provided the work is properly attributed. For permission for commercial use of this work, please see paragraphs 42 and 5 of our Terms (https://www.dovepress.com/terms.php). IOL after posterior capsulotomy.^{12,13} In this article, we report a case of extensive deposition of PEX material on posterior chamber IOL without a history of posterior capsulotomy. The density of deposition was severe enough to require IOL exchange.

Case Presentation

This is a case report of a 61-year-old man who presented to our service for evaluation of bilateral blurry vision and visual impairment in both eyes (BE) for one year. Ocular medical history revealed cataract surgery in the left eye 3 years ago at another institution with uneventful intraoperative and postoperative course. General examination indicated multiple attacks of deep vein thrombosis. On clinical ophthalmologic examination, the right eye had dense posterior subcapsular cataracts and moderate nuclear cataracts. The lens exhibited severe phacodonesis and moderate pupillary dilation, without apparent PEX. Examination of the left eye revealed a centered posterior-chamber IOL with extensive visually significant PEX deposition over the entire implant (Figure 1A and B). Review for the ophthalmic records of the details of the previous left cataract surgery revealed similar lenticular behavior of phacodonesis, poor pupillary dilation, and iris-expansion device was used during that operation. Fundus examination results were normal in both eyes. The cup to disc ratio was 0.3 in both eyes without signs of glaucomatous changes. His best-corrected visual acuity was 6/30 in the left eye and 6/60 in the right eye, with intraocular pressure (IOP) of 11 mmHg in both eyes. Optical coherence tomography for the optic nerve was performed and revealed normal thickness of retinal nerve fiber layer. Automated perimetry revealed normal visual field function.

The decision was to perform right eye phacoemulsification and IOL implantation and left eye IOL exchange. An uneventful phacoemulsification with an intraocular lens implant was performed in the right eye and started with creation of two side ports and main clear corneal incision. Adequate-size circular continuous capsulorhexis with subsequent gentle hydrodissection and hydrodelineation were performed. Then, Phaco-chop technique was utilized to aspirate the cataract and posterior-chamber IOL was implanted successfully. After one month, the right eye achieved visual acuity of 6/6 with normal IOP. Then, the left eye underwent a successful IOL exchange. The operation started with two side ports and a 2.8 mm clear corneal incision. The IOL was delivered to the anterior chamber and split by Vannas scissors into two halves and extracted from the main wound. Subsequently, posterior capsulotomy and anterior vitrectomy were performed. Acetylcholine chloride solution was then injected in the anterior chamber and a retropupillary iris-claw IOL was implanted successfully after extending the corneal incision into about 5.4 mm. At the end of the operation, three nylon sutures were applied to the corneal incision. One month postoperatively, the sutures were released with a best corrected visual acuity of 6/6. The extracted implant was examined under a microscope and showed fibrillary deposition (Figure 2A–C). The deposition of the PEX material was unique in that it was diffusely distributed within the large stellate-like deposits. The best-corrected visual acuity after 3 months of successful surgery was 6/6 in both eyes. The intraocular pressure was within the normal range.



Figure I (A) optical coherence tomography showing the PEX material on the intraocular lens implant. (B) color photograph indicating the PEX material.



Figure 2 Light Microscopic appearance of the depositions on 10x magnification (A), 40x magnification (B) and 100x magnification (C).

Discussion

We report a unique case of visually significant large stellate-like PEX deposits over the posterior chamber IOL that was successfully managed with IOL exchange using a retropupillary iris-claw IOL. The deposition of PEX material on the surface of a posterior chamber IOL is generally known to be an uncommon finding. Following Nd:YAG laser posterior capsulotomy, Bahadur et al reported one case of PEX deposition on a posterior chamber IOL.¹² Similarly, Roberts et al described another case of PEX material deposition on posterior chamber IOL following posterior capsulotomy. The authors hypothesized that capsulotomy enabled alteration in aqueous flow within the posterior chamber of the anterior segment that would enhance PEX deposition on the IOL surface.¹³ On the other hand, Park and Kee published four similar cases of PEX deposition on IOLs, in which three patients had no previous posterior capsulotomy.^{14,15} In their series, da Rocha-Bastos et al proposed the theory of mechanical or ischemic factors in increasing the chance of PEX production in tissues adjacent to the IOL. This assumption was enhanced by the report of PEX deposition on the IOL in the ciliary sulcus (three cases) or by the ischemia of the ciliary body induced by a scleral buckle (one case).¹⁰ The implantation of the IOL within the ciliary sulcus would reduce the distance between the IOL and iris tissue, this factor would enable the deposition of PEX material over the IOL.^{10,16} In 2012, a series of five patients presented with PEX deposition on the surface of IOL was reported, and eventually all patients developed primary open-angle glaucoma years after cataract surgery.¹⁵ In our report, the IOL was implanted in a bag in a patient with a history of capsulotomy or glaucoma.

Although the exact origin of PEX material remains unclear, recent publications indicate that PEX depositions are synthesized by non-pigmented ciliary epithelial cells, trabecular endothelial cells, vascular endothelial cells in the iris, and preequatorial lens epithelium cells.¹⁰ PEX deposits were found on natural lenses. PEX deposits are composed of different extracellular, molecular, and membrane proteins and enzymes that include tropoelastin, fibrillin-1, elastin, LOL1, amyloid, fibulin, vitronectin, and clusterin.¹⁷ In addition to the structures of the eye, similar deposits have been identified in various visceral organs such as lung, heart, brain, vessels, kidney, gallbladder and meninges and it is linked to venous thrombosis, and cardiovascular events.^{18–20} It is unusual for such cases to be reported as the distance between the posterior iris epithelium and an IOL is too large to allow deposition of PEX material, resulting in these cells passing into the posterior chamber.¹⁶

The most common pattern of deposition is radial striations or lines on the anterior surface of the IOL, similar to the pattern commonly detected in PEX material on crystalline lens.^{14,21} Park and Kee reported two other patterns of PEX deposition on IOL.¹⁴ In their series, the pattern of deposition in case 3 was a scattered dot-like deposition on the posterior capsule and posterior surface of the IOL. In the fourth case, the posterior surface of the IOL was only involved.¹⁴ It is believed that IOL material (either PMMA, acrylic, or silicone) might have influenced the pattern of deposition of the PEX material.¹⁴ The absence of a central disc pattern in these cases might result from the absence of the anterior capsule, or it may be that the adhesive power of the IOL for the PEX material is lower than that of the crystalline lens.¹⁴

We suppose that the deposition of PEX material on the surface of the IOL might result from enhanced production of PEX material from the stimulated structured adjacent to the IOL. We are still unable to fully understand the clinical significance of PEX depositions on IOL surfaces. Nevertheless, this sign should alert ophthalmologists to the possibility of progression from PEX depositions to secondary PEX glaucoma or an increased risk of progression of already established PEX glaucoma. However, due to its subtlety, the diagnosis may be delayed. Accordingly, encouraging the patient for more follow-up would be justified.

This case highlights the importance of comprehensive examination of patients with PEX, even of patients who are pseudophakic. Cautions while dealing with cataract surgery for those patients should be taken promptly. Based on the fact most cases of PEX depositions over IOL developed glaucoma after cataract surgery, we encourage careful follow-up after cataract surgery to monitor the development of glaucoma. Herein, visually significant PEX deposition was reported. Examination of the extracted IOL under a microscope was performed.

Consent for Publication

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. The institutional review board approval is not required for case reports.

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Disclosure

In this work, the authors declare no conflicts of interest.

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