Surface Calcification of a 3-Piece Silicone Intraocular Lens in a Patient with Asteroid Hyalosis

A Clinicopathologic Case Report

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Objective: To illustrate the laboratory findings in a patient with bilateral asteroid hyalosis who presented with calcified deposits on a 3-piece silicone intraocular lens (IOL).

Design: Observational case report.

Methods: A 76-year-old diabetic woman underwent uneventful cataract surgery in 1994 with implantation of a silicone-optic polypropylene-haptic IOL in the left eye. A neodymium:yttrium–aluminum–garnet (Nd:YAG) laser posterior capsulotomy was performed 2 years after cataract surgery, but persistent whitish deposits were observed on the posterior optic surface of the lens. Over the next 3 years, the opacification increased in the region corresponding to the capsulotomy. The IOL was explanted/exchanged. The right eye had cataract surgery in 1995. The acrylic lens implanted in this eye developed no opacities after 6 years.

Main Outcome Measures: Gross, microscopic, and surface analyses of the explanted IOL.

Results: Gross and light microscopic analyses revealed the presence of confluent crustlike deposits on the central area of the posterior optic surface, as well as Nd:YAG pits. Individual spherules exhibiting a Maltese-cross pattern under polarizing light were also observed. Energy dispersive x-ray spectroscopic analyses demonstrated the composition of the confluent deposits to be similar to hydroxyapatite.

Conclusions: An association between asteroid hyalosis and dystrophic calcification of IOLs has been reported only with silicone plate haptic designs. The material opacifying the 3-piece silicone lens probably was derived from the asteroid bodies or from the process that results in this vitreous condition. Clinical evaluation of other pseudophakic patients with asteroid hyalosis will confirm if this phenomenon is restricted to silicone IOLs.
Ophthalmology 2005;112:447–452

We recently described 3 cases of late postoperative dystrophic calcification on the posterior optic surface of plate–haptic silicone intraocular lenses (IOLs).[1] In all cases, the patient had associated unilateral asteroid hyalosis. Another case with similar features also was reported recently by Wackernagel et al,[2] with the same lens design. To the best of our knowledge, the present report is the first describing the analyses performed on a 3-piece silicone IOL explanted because of optic opacification from a patient with this vitreous condition. In this case, the patient had bilateral asteroid hyalosis, and the acrylic lens implanted in the contralateral eye showed no opacities.

Originally received: July 23, 2004.
Accepted: October 4, 2004. Manuscript no. 240579.

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Presented in part at: American Academy of Ophthalmology annual meeting, October, 2004; New Orleans, Louisiana.

Supported by Research to Prevent Blindness, New York, New York (Olga Keith Wiess Scholar Award to LW).

The authors have no financial or proprietary interest in any product mentioned in this article.

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Case Report

The patient was a 76-year-old woman diagnosed with diabetes mellitus at age 51 and treated with insulin for 25 years. Her left eye had 2 focal laser treatments for diabetic macular edema before cataract surgery and 2 other treatments after this surgical procedure. She underwent uncomplicated cataract surgery in the left eye on October 4, 1994, with implantation of an AMO SI-30 NB 3-piece silicone IOL (Advanced Medical Optics, Santa Ana, CA). Viscoat (Alcon Laboratories, Fort Worth, TX) was the ophthalmic viscosurgical device used during the IOL implantation. Subsequently, the surgeon noted opacities on the posterior surface of the IOL (thought to be due to secondary cataract) on September 25, 1996. Neodymium:yttrium–aluminum–garnet (Nd:YAG) laser posterior capsulotomy was performed on the following day, but the opacities were still present on September 27, 1996. One of us (CRK) first examined the patient in June 9, 1999. A diamond-shaped opening in the posterior capsule associated with the Nd:YAG posterior capsulotomy was observed, as well as whitish opacities with linear scratches on the posterior optic surface of the

ISSN 0161-6420/05/$–see front matter
doi:10.1016/j.ophtha.2004.10.025

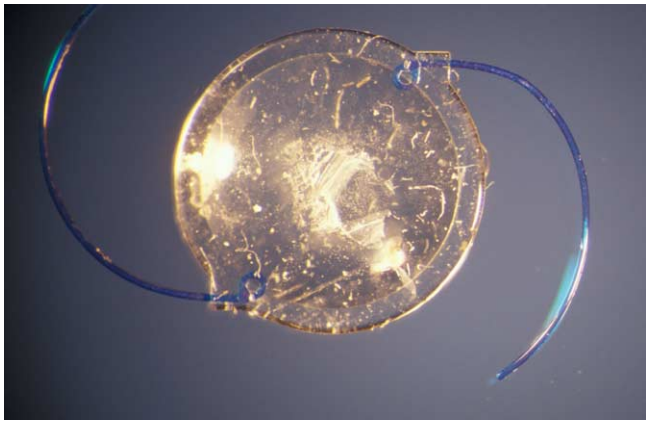

Figure 1. Gross photograph from the posterior surface of the explanted 3-piece silicone intraocular lens, showing the deposits on the central area of the optic. Multiple fibers were also found on the lens surface.

lens, only in the area where the capsule was opened. Asteroid hyalosis was also noted at that visit. According to the prior surgeon's records, asteroid hyalosis had not been noted in the vitreous cavity until February 1998. As part of the patient's medical treatment, serum calcium was measured at 8.7 mg/dl (normal range, 8.8–10.5 mg/dl), indicating that the patient was slightly hypocalcemic. By August 2000, the patient's best-corrected visual acuity (BCVA) was 20/300 in the left eye, attributed, at least in part, to the opacities on the posterior surface of the IOL. On August 17, 2000, IOL explantation/exchange was performed, in association with a limited anterior vitrectomy. A Storz Surgical (St. Louis, MO) IOL model 560 CUV polymethyl methacrylate (PMMA) lens was implanted in the ciliary sulcus. The patient's BCVA improved after the procedure, but was limited to 20/100 due to diabetic ischemic optic neuropathy. Best-corrected visual acuity in the right eye was 20/60, for the same reason. The patient had had an uneventful cataract surgery in her right eye on July 23, 1995 with implantation of an acrylic IOL (AcrySof, model

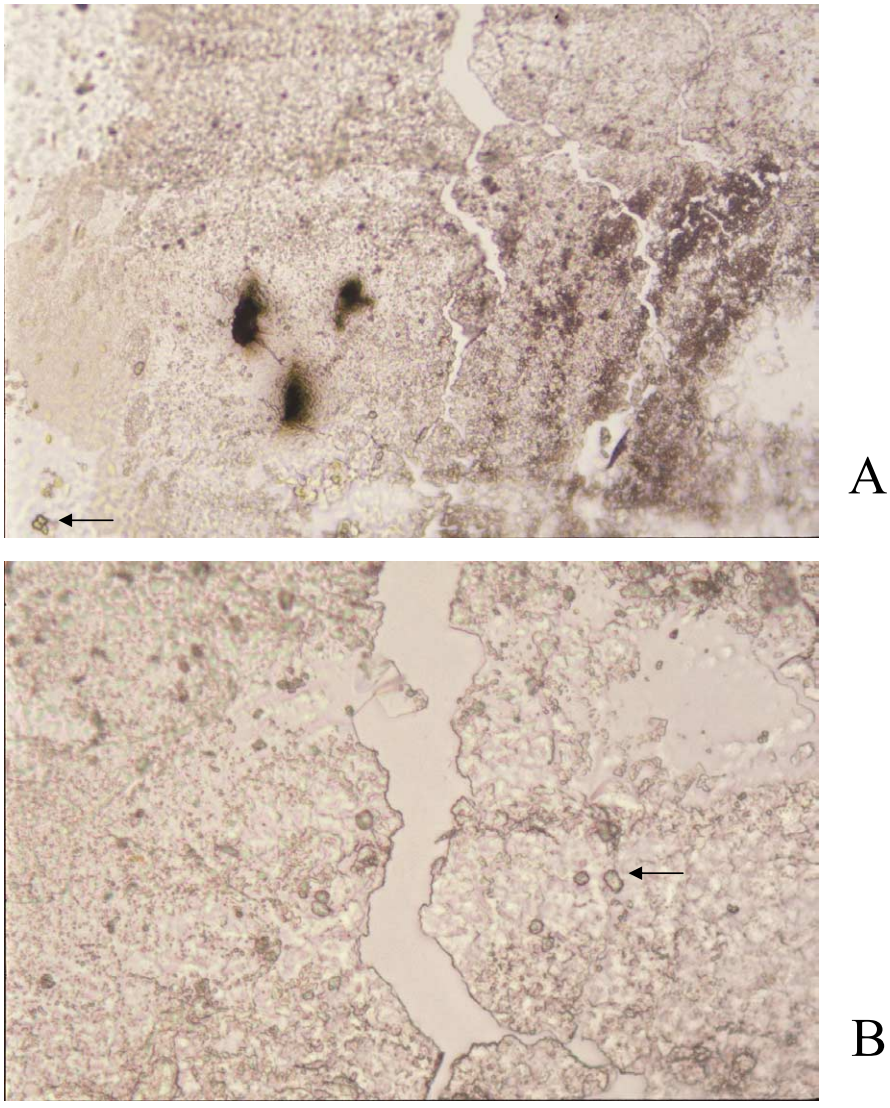

Figure 2. Light photomicrographs from the deposits on the posterior optic surface of the explanted lens. **A**, The deposits are confluent in this area, with a crustlike appearance. Three pits on the optic surface can also be seen (original magnification, ×100). **B**, Clear areas with the appearance of cracks were found interspersed with the confluent deposits (original magnification, ×200). The arrows in A and B show relatively large individual spherules, which were found to present a Maltese-cross pattern under polarizing light.