Late reopening of fibrosed capsular bags to reposition decentered intraocular lenses

I. Howard Fine, MD, Richard S. Hoffman, MD

ABSTRACT

The infrequent postoperative complication of intraocular lens decentration in the presence of an intact fibrosed capsule has traditionally been treated with lens explantation and exchange for a sulcus-fixated lens. Many of these patients can be managed by reopening the fibrosed capsular bag and repositioning the lens within the bag. These cases can be performed quickly using topical anesthesia regardless of the time since the primary cataract procedure. *J Cataract Refract Surg 1997; 23:990-994*

With the increasing popularity of clear corneal incisions, more surgeons are turning to foldable intraocular lenses (IOLs) as their first choice for correcting aphakia. Perhaps the easiest IOL to implant is a silicone plate-haptic lens, which can be inserted with an injector through an incision size between 2.5 and 3.0 mm. The ease of implanting these lenses has been partially overshadowed by the unique difficulties caused by their not being fixated to any part of the capsular bag. One such difficulty is the increased tendency for lens decentration.[1,2]

Lens decentration is believed to result from progressive fibrosis and contracture of the capsulorhexis secondary to proliferated lens epithelial cells (LECs) and deposition of aberrant extracellular matrix.[3-6] As adhesions form between the anterior and posterior capsules, closing the peripheral bag can result in forces that "pea-pod" or shift IOL centration. Although all lens styles are at risk for decentration, plate-haptic lenses are perhaps more vulnerable than others and have been reported to displace into the vitreous cavity after neodymium:YAG (Nd:YAG) laser capsulotomy.[7]

As described by Grabow ("Staar AA4203C Complications," presented at the Welsh Cataract Congress, Houston, TX, USA, September 1988) and Osher and Eguchi ("Late Re-opening of the Capsular Bag," Audiovisual Journal of Cataract & Implant Surgery 1993, volume 9, issue 1), it is our experience that IOL decentration can be managed at any time in the postoperative period by reopening the capsular bag and recentering the lens within the bag. We believe this is a better method of handling decentrations than explantation and exchange for a sulcus-fixated lens.

Surgical Technique

Many patients with clinically significant lens decentration will present with concomitant posterior capsule opacification (PCO). It is important to determine whether symptoms of blurred vision, monocular diplopia, glare, and rings of light are secondary to lens decentration, PCO, or both. If there is any doubt as to the cause of a patient's complaints, we recommend proceeding with lens repositioning before performing an Nd:YAG laser capsulotomy because an open poste-

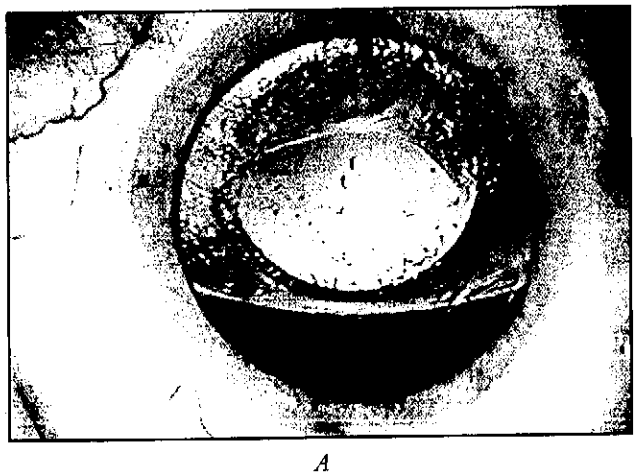
From Oregon Eye Associates, Eugene, Oregon, USA.

Reprint requests to I. Howard Fine, MD, Oregon Eye Associates, 1550 Oak Street, #5, Eugene, Oregon 97401, USA.

rior capsule will complicate any attempt at future lens repositioning. In addition, when these surgeries are performed (frequently in eyes with IOLs that allow 20/20 uncorrected visual acuity), it is very important to angle the microscope light away from the macula. Although these surgeries can be done quickly, macular burns can occur in a relatively short period when the microscope light is concentrated and focused on the macula by the IOL.

We have accomplished recentration through two or three paracenteses using topical anesthesia. Although most surgeons inject viscoelastic immediately after the paracentesis to protect the corneal endothelium, we do not recommend filling the anterior chamber with viscoelastic as this would limit the working space posterior to the iris plane for lens manipulation and capsular synechiolysis. The anterior capsular bag is reopened by viscodissection and blunt dissection. Forceps should not be used on the capsulorhexis or any portion of the bag because they tend to concentrate forces, making capsule tearing more likely. In contrast, viscodissection and blunt dissection distribute forces evenly over a broader area and can free adhesions between the anterior and posterior capsules without tearing the capsules.

The first paracentesis location should allow easy access to the capsulorhexis in an area in which there is a large portion of the IOL under the capsulorhexis. The cannula can then be slipped under the capsulorhexis and over the IOL. Sodium chondroitin sulfate–sodium hyaluronate (Viscoat®) can be injected into the capsular bag and into the capsular fornices, carefully dissecting the anterior capsule off the posterior capsule. The capsulorhexis can be swept with a blunt cannula as long as there is mechanically advantageous access to the capsulorhexis through the initial side port. The second paracentesis location should give better access to the remainder of the capsulorhexis. In this way, one can fully open the capsular bag and bluntly dissect and



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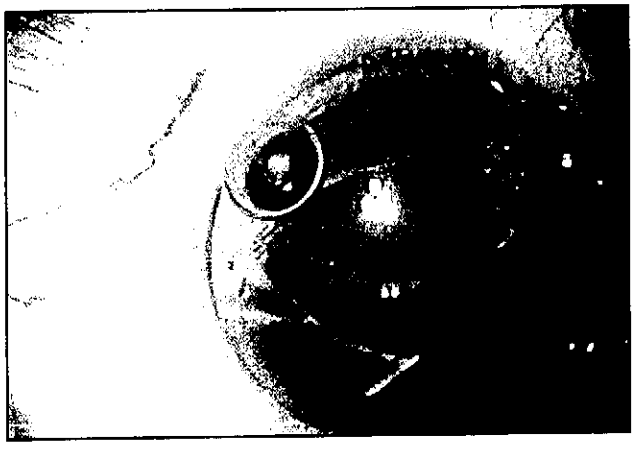

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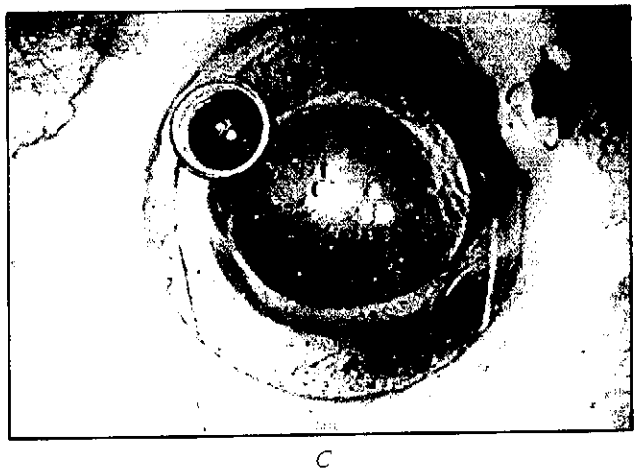
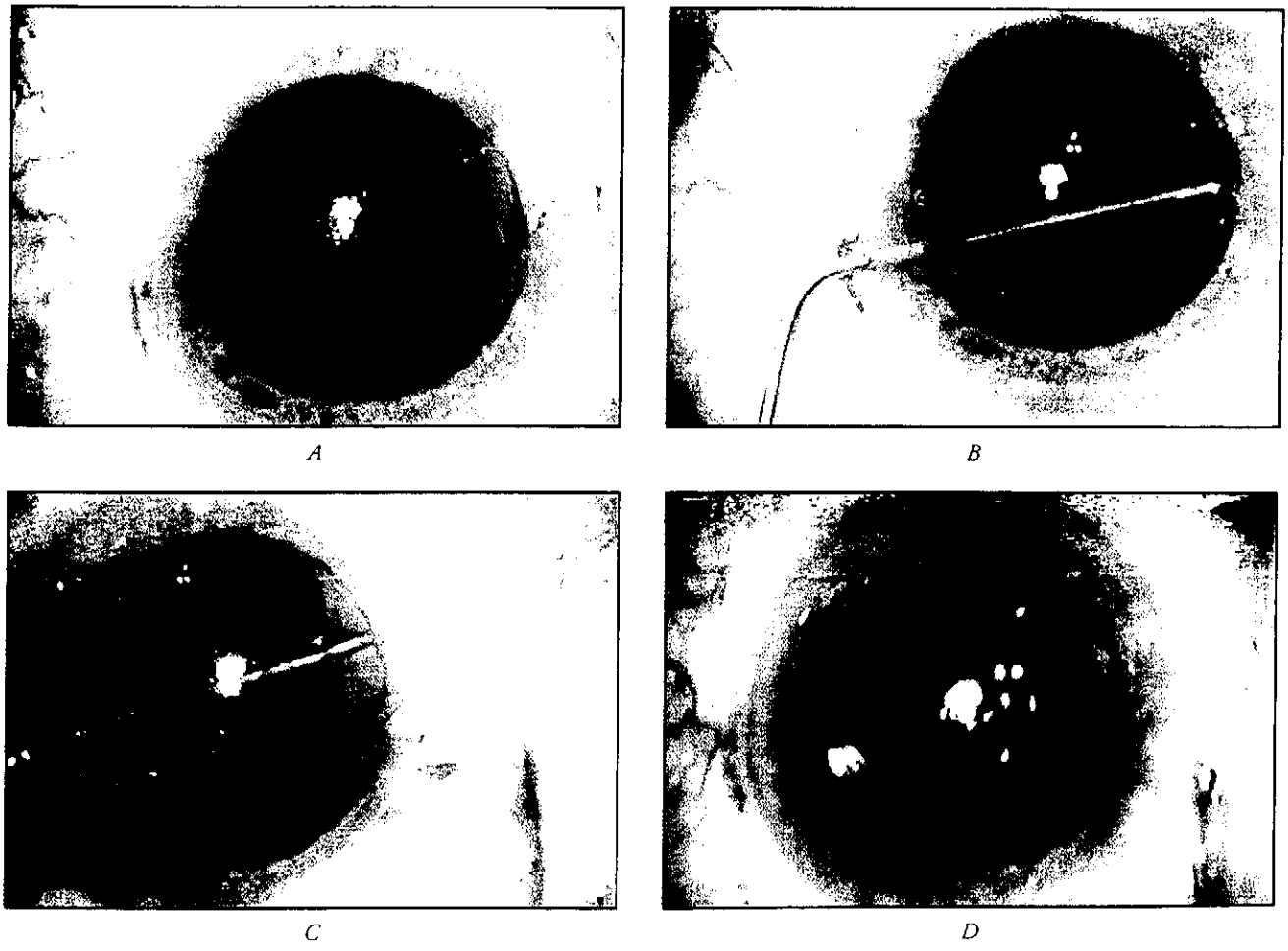


C

Figure 1. (Fine) Patient with symptomatic decentration of a plate-haptic lens (*A*). Dissection of adhesions between capsulorhexis and posterior capsule by a combination of blunt and viscodissection. Note the broad angle of contact between the viscoelastic cannula and the adhesion (*B*). In this patient, once all adhesions have been broken, the lens is repositioned in the axis of the lysed adhesions for best centration (*C*).

A *B*

Figure 2. (Fine) Patient with symptomatic superior decentration of one-piece poly(methyl methacrylate) lens with concomitant dense PCO. Viscodissection of fibrosed capsulorhexis from posterior capsule (*A*) followed by lens repositioning results in a well-positioned lens postoperatively (*B*). The patient had an Nd:YAG laser capsulotomy 2 weeks after lens repositioning.



A *B*

C *D*

Figure 3. (Fine) A decentered plate-haptic lens resulting from asymmetric implanation with the temporal plate in the bag and the nasal plate in the ciliary sulcus. Fibrosis of the capsulorhexis to the posterior capsule can be seen behind the lens optic (*A*). Viscodissection of capsule surrounding the in-the-bag haptic (*B*) is followed by prolapse of this haptic into the sulcus. Blunt dissection and viscodissection are then performed under the lens to fully open the bag for 360 degrees (*C*). The lens is then reposited and well centered in the bag (*D*). The temporal limbus is at bottom of photographs.

separate any fibrosis of the capsulorhexis to the posterior capsule (Figures 1 to 3).

One must be careful not to overly stress the capsulorhexis, causing the bag to tear. When possible, sweeping forces in the adhesions between the capsulorhexis and the posterior capsule should follow the long axis of a plate-haptic lens or the axis of the haptics in a looped-haptic lens. This will limit movement of the bag and thus prevent zonular dialysis. By a combination of blunt dissection and viscodissection, the capsular fornices are fully expanded, adhesions between anterior and posterior capsules and between capsulorhexis and posterior capsule are fully freed, and the lens can be easily manipulated within the capsular bag.

When the capsulorhexis is oval, we usually reposition a plate-haptic lens so that the long axis of the lens is parallel to the long axis of the capsulorhexis. In contrast, we try to align the long axis of a looped-haptic lens perpendicular to the long axis of an oval capsulorhexis in an effort to stretch that capsulorhexis into a rounder configuration.

After reopening the bag and recentering the lens, one can carefully inject a miotic such as acetylcholine chloride (Miochol®) through one paracentesis while depressing the posterior lip of that paracentesis with the cannula. This allows viscoelastic to escape as the miotic is injected into the distal anterior chamber angle.

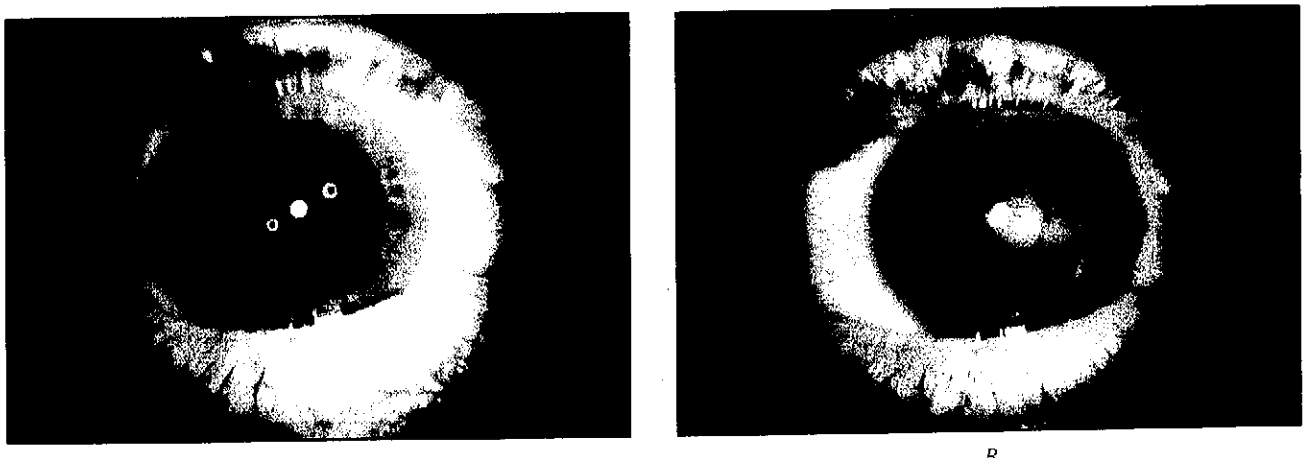
In the rare instance when lens decentration occurs secondary to asymmetrical implantation or one of the plate haptics prolapses out of the capsular bag, we recommend prolapsing the remaining lens haptic into the ciliary sulcus to assist in the lysis of capsular adhesions. The lens can then be easily reinserted into the bag after the bag is completely reopened (Figure 3).

We have found that these capsular bags have often undergone all the metaplasia, fibrosis, and contracture they are likely to and will not progress further (Figure 4). If in doubt, after lens repositioning, make a snip in the fibrosed ring and tear a new continuous curvilinear capsulorhexis outside the fibrotic and metaplastic ring.

Discussion

Attempts to decrease the rate of lens decentration have focused on two areas: alterations in capsulorhexis size and lens design. Some surgeons[8,9] are now recommending a larger capsulorhexis to decrease the burden of residual LECs and perhaps the tendency for capsular contracture, which can contribute to lens decentration. By the same token, a large capsulorhexis presents greater opportunity for a portion of the capsulorhexis to adhere to the posterior capsule beyond the optic of the IOL, increasing the risk of lens movement.

The manufacturers of plate-haptic, foldable, silicone IOLs have responded to the challenge of lens decentration by altering lens design. The Staar Surgical IOL now has two large 1.15 mm fenestrations that allow fibrosis of the anterior capsule to the posterior



A *B*

Figure 4. (Fine) The same patient as in Figure 3. The lens is stable, and there is no capsular fibrosis progression from immediate postoperative recentration (*A*) to more than 2 years postoperative recentration (*B*).

capsule through the fenestrations, increasing lens stability (D.J. Apple, MD, "Enhancement of Silicone Plate IOL Fixation by the Use of Positioning Holes in the Lens Haptic," N. Mamalis, MD, "Comparison of Silicone Plate Haptic IOL Models AA-4203 and AA-4203F in a Rabbit Model," presented at the Symposium on Cataract, IOL and Refractive Surgery, Seattle, Washington, USA, June 1996). Chiron Surgical has also altered their plate-haptic design. Two polyimide half haptics inserted at opposite ends of the plate allow fibrosis of the peripheral capsule between the half haptic and the edge of the plate to increase lens stability (J. Colin, MD, P. Condon, MD, personal communications, June 1996).

These alterations in surgical technique and lens design may diminish the incidence of lens decentration; however, the potential for decentration of older lens designs already implanted and newer lenses will still occur. As a result, a method of managing this problem is necessary. We have safely reopened fibrosed capsular bags with decentered IOLs as many as 3 years postoperatively (Figure 3) and believe that recentration can be performed regardless of the time since implantation. This can be done rapidly using topical anesthesia and is preferable to the more invasive procedure of IOL exchange.

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