Performing cataract surgery in an eye with a shallow anterior chamber is challenging. This situation is often seen in patients with narrow-angle glaucoma, hypermature cataract, high hyperopia, nanophthalmos, or iridocorneal endothelial syndrome. It is also common after penetrating keratoplasty or filtration surgery.\(^1\)\(^-\)\(^5\)

In such cases, we have recently started applying an oculopressor for 10 to 15 minutes before cataract surgery, then waiting another 15 or 20 minutes to deepen the anterior chamber and promote intraocular hypotension before commencing surgery. Using this approach, we have been able to facilitate safer cataract surgery and compensate for shallow anterior chambers.

A shallow anterior chamber can cause several types of difficulties during cataract surgery. First, it complicates the creation of clear corneal wounds because the anterior lens capsule or endothelial cells can be damaged during incision creation; second, it makes it more difficult to perform the capsulorrhexis with forceps or cystotome; and third, it increases the risk of touching the endothelial cells during surgical manipulation, which can lead to corneal edema or decompensation. Due to fluid flow, iris prolapse can also be encountered in eyes with a shallow anterior chamber.

**CORE VITRECTOMY**

Because of the risk of surgical complications, various techniques have been devised to deepen the anterior chamber before cataract surgery. For instance, some prefer to perform a core pars plana vitrectomy (PPV) at the beginning of surgery. However, before the cataract is removed it blocks the view of the retina, for which reason the term *blind core PPV* was coined (personal communication, I. Howard Fine, MD). In this technique, a small amount of vitreous is removed with a vitrectome through the pars plana, and the anterior chamber is then deepened by injecting fluid or an ophthalmic viscosurgical device (OVD).

Blind core PPV can be successful, but it also has drawbacks. Principally, many cataract surgeons have little experience performing PPV. Additionally, damage to the posterior capsule can occur during the procedure, which might lead to further and more severe intraoperative complications such as a dropped nucleus. Vitreous bleeding from the pars plana wound and choroidal effu-
Aversion syndrome can occur. Retinal damage can also occur due to lack of surgical experience, and inappropriate wound closure can lead to wound leakage, vitreous incarceration, and potentially endophthalmitis.

**OCULOPRESSOR**

Our alternative approach to deepening the anterior chamber is use of an oculopressor. This instrument was invented and first used by Professor Dániel Vörösmarthy in Hungary, whose first article describing its use to achieve hypotony during manual cataract extraction surgery was published more than 40 years ago.6

The oculopressor has since been widely used before both intra- and extracapsular cataract extraction, at a time when cataract surgery was routinely performed under peribulbar or retrobulbar injection. Application of the oculopressor squeezes fluid from the vitreous, so vitreous pressure is decreased and the eye is softened.

**CLINICAL EXPERIENCE**

We evaluated the use of oculopression in a small series of patients. Oculopression was applied for 15 minutes on

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**TAKE-HOME MESSAGE**

- The oculopressor squeezes fluid from the vitreous to decrease vitreous pressure and soften the eye.
- The shallow anterior chamber can be deepened by applying oculopression for 10 to 15 minutes and waiting another 20 minutes before commencing cataract surgery.

Different types of oculopressors, such as the Deutschmann oculopressor with manometer (Figure 1), the Honan balloon, and the Super Pinky ball, have been used to decrease the vitreous volume and thus vitreous pressure. With these methods, vitreous loss could be prevented and expulsive hemorrhage avoided.
20 eyes of 20 patients using a rubber band and Super Pinky ball with patients either in a sitting or lying position (Figure 2). Heart rates were monitored with electrocardiograph and pulse oximeter.

The depth of the anterior chamber was measured before and after oculopression with the OcuScan RxP A-scan ultrasound device (Alcon Laboratories, Inc., Fort Worth, Texas) using the noncontact immersion method, and with Visante OCT optical coherence tomography (Carl Zeiss Meditec, Jena, Germany). The axial length of the eyes was also measured with ultrasound before oculopression and immediately and 20 minutes after removal of the Super Pinky.

Oculopression was applied safely after topical anesthesia in all patients. The change in anterior chamber depth in 10 eyes with originally normal anterior chamber depth (3.326 mm) was 7.2%, which was not clinically significant (Figure 3). The change in anterior chamber depth in 20 eyes with originally shallow chamber depth (2.318 mm) was 9.7%, which was clinically significant (Figure 4; Table 1).

**CONCLUSION**

In eyes with shallow anterior chambers, the anterior chamber can be deepened by applying oculopression for 10 to 15 minutes and waiting another 20 minutes before commencing cataract surgery. Even if the amount of anterior chamber deepening achieved with this technique is not significant, filling the chamber with OVD and performing the cataract extraction in a softened eye is much easier and safer.

**TABLE 1. CHANGE IN ANTERIOR CHAMBER DEPTH (ACD) AND AXIAL LENGTH (AL) AFTER OCULOPRESSION**

<table>
<thead>
<tr>
<th>Original eye status</th>
<th>ACD</th>
<th>AL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average AC depth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before oculopression</td>
<td>3.326 mm</td>
<td>23.608 mm</td>
</tr>
<tr>
<td>20 minutes after oculopression</td>
<td>3.567 mm</td>
<td>23.600 mm</td>
</tr>
<tr>
<td>Shallow AC depth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before oculopression</td>
<td>2.318 mm</td>
<td>23.496 mm</td>
</tr>
<tr>
<td>20 minutes after oculopression</td>
<td>2.775 mm</td>
<td>23.482 mm</td>
</tr>
</tbody>
</table>

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