
Modified technique using flexible iris retractors in clear corneal cataract surgery

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Flexible nylon iris retractors are a useful adjunct to cataract surgery in cases of small pupil. We present a modification of the standard technique. Instead of approaching the square-shaped pupil formed by iris retractors from the side, we recommend an approach anterior to 1 of the retractor hooks. From the surgeon's viewpoint, the pupil goes from a square shape to a diamond shape. This modification minimizes the likelihood of iris prolapse and iris damage during phacoemulsification and increases the workspace for the phacoemulsification needle.

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A small pupil presents a challenging problem for cataract surgeons. Many solutions have been devised to help increase the pupil size during cataract surgery. Simple stretching of the iris is effective, particularly when the pupil diameter is 4.0 to 5.0 mm and central posterior synechias are present. However, some pupils do not stretch well and are best served by other techniques.

Graether¹ describes a device to expand the pupil that many have found useful. Another useful tool for managing very small pupils is the iris retractor. MacKool² developed iris retractors that have small hooks connected to small blocks of titanium that can be used without an assistant to retract the iris. The device we have found most useful is the flexible iris retractor made from modified suture material with a plastic sleeve developed by de Juan and Hickingbotham.³ The instrument has been used for purposes other than iris retraction, including for capsular support in cases of zonular dehiscence.

In previously reported methods, 4 flexible iris retractor are generally used and are inserted 90 degrees apart from one another. The retractors are placed through paracentesis wounds at the limbus and then used to retract the iris, resulting in a pupil that goes from round to square. Classically, the incision is made along the side of 1 of the squares centered between 2 of the iris retractors (Figure 1). However, with this wound placement, the phacoemulsification needle must pass over the iris, which is often tented between the 2 hooks on either side and is sometimes slightly elevated. At times, even with the iris hooks, the iris can prolapse through a corneal incision (Figure 2). However, with scleral tunnel incisions at the limbus, this is the only choice for wound placement for phacoemulsification.

We describe a modification of this technique for clear corneal phacoemulsification. The phacoemulsification incision is shifted 45 degrees to an area just ante-

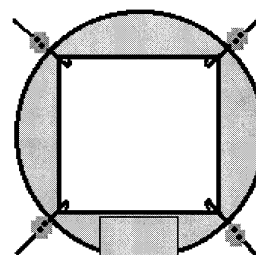


Figure 1. (Oetting) Drawing of the classic technique using iris retractors.

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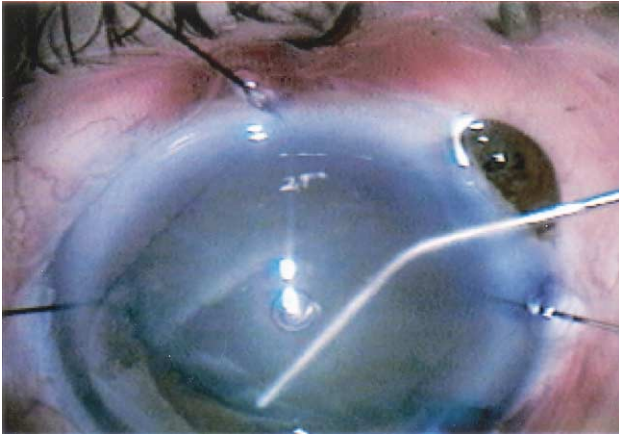


Figure 2. (Oetting) Iris prolapse using the classic square technique of iris retraction.

rior to 1 of the iris hooks (Figure 3). Because the iris is pulled under the wound, it is unlikely to prolapse through the wound. In addition, the phacoemulsification needle does not pass over the tented iris as it enters anterior and central to the retracted iris. Finally, because the phacoemulsification needle works along the diagonal of the square, more area is available.

Surgical Technique

The cornea is dried with a Weck-Cel® sponge (Solan), and the area for the wound is marked on the cornea with a surgical marker. A second mark is placed 180 degrees across from the wound, and the remaining 2 sites are marked 90 degrees on either side in a similar fashion. A paracentesis is made in a comfortable position for insertion of the second instrument. Four additional incisions are made at the marked sites for the iris hooks (eg, Alcon/Grieshaber ultrasharp microsurgical knife 681.05). Three of the iris hooks (Alcon/Grieshaber flexible iris retractors 611.65) are then placed (leaving the subincisional hook for later) as described by Nichamin.⁴ With 3 iris retractors in position, viscoelastic material is placed in the eye to stiffen it before the corneal incision is made. The clear corneal incision is made approximately 0.5 to 1.0 mm anterior to the limbus. The last iris retractor hook is placed in the subincisional area just posterior to the corneal phaco incision. Each hook is brought into position, creating a diamond-shaped pupil (Figure 4).

The remainder of the procedure is performed in a standard fashion. The iris stays in the anterior chamber

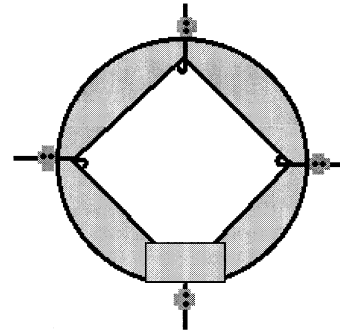


Figure 3. (Oetting) Drawing of the modified diamond technique using iris retractors.

as the subincisional iris is retracted under the wound. Phacoemulsification is eased with the extra space afforded by working along the diagonal, and the surgeon does not need to pass over iris to get to the lens (Figure 5). The phaco tip easily glides by the retractor as the retractor is flexible and tends to bend out of the way. At the conclusion of the case, the retractors are removed in the standard fashion as described by Nichamin.⁴

Discussion

Our modification of the iris retractor technique is useful in clear corneal phacoemulsification. Rather than

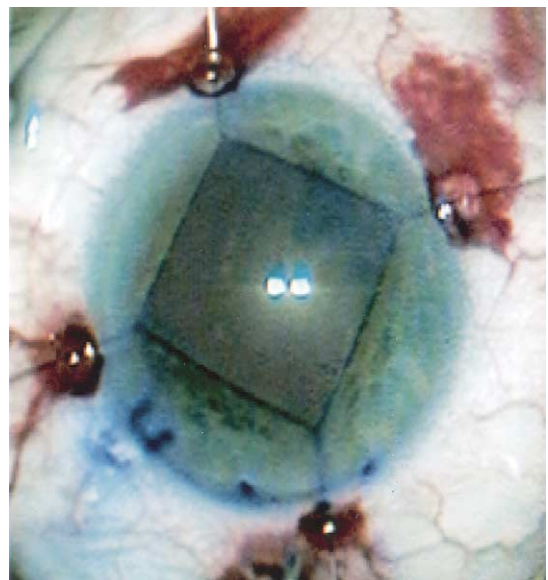


Figure 4. (Oetting) Placement of iris retractors in the modified diamond configuration.

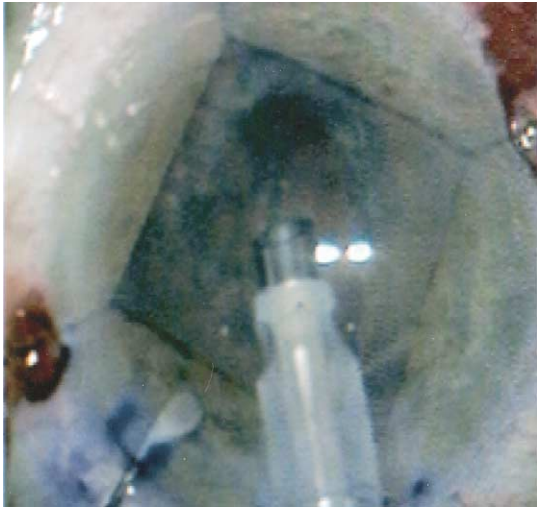


Figure 5. (Oetting) Phacoemulsification using modified iris retractor configuration.

approaching the square-shaped pupil formed by the retractors from the side as classically described, we approach from the apex of the square with the phacoemulsification incision just anterior to 1 retractor hook. As such, from the surgeon's perspective, the pupil looks more like a diamond than a square.

We believe that the modified technique has several advantages. In the conventional technique, when the square pupil formed by the iris retractors is approached from the side, the iris can prolapse through the wound. This is particularly true in patients with small pupils who tend to have atonic and atrophic irides that seem

particularly "floppy" and prone to prolapse. When approached from the apex of the square or in the diamond configuration, the iris is pulled posterior to the phacoemulsification wound, making prolapse far less likely.

Second, the phacoemulsification needle in the square configuration must pass over the tented iris to reach down into the lens material. When the wound is rotated 45 degrees to a diamond configuration, it is already anterior to the retracted iris; the surgeon does not need to pass over the iris to reach the lens material.

The final advantage is that the diamond configuration provides more room for nucleus fragmentation and removal. The diamond configuration allows the surgeon to work along the diagonal of the square-shaped pupil formed by the iris retractors. This provides more room for grooving the nucleus and increased peripheral visualization for chopping.

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