TECHNIQUE

25-Gauge Pars Plana Lensectomy With Vitrectomy

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BACKGROUND AND OBJECTIVE: To describe a technique of 25-gauge pars plana lensectomy with primary posterior capsulotomy and sparing of the anterior lens capsule that is suitable for all lens densities.

PATIENTS AND METHODS: The authors describe a technique they routinely employ for pars plana vitrectomy using primarily a 25-gauge, three-port approach with intraoperative lens density assessment and possible fragmatome use for dense lenses. An analysis of the ability to achieve surgical goals is provided.

RESULTS: Surgical goals were achieved in all 68 cases performed during an 18-month period. Anterior lens capsule was consistently spared, and 25-gauge fluidics functioned well even in the presence of a fragmatome and single 20-gauge sclerotomy.

CONCLUSION: 25-gauge pars plana lensectomy with vitrectomy with and without fragmatome incision is an efficacious technique for lensectomy.


INTRODUCTION

Pars plana lensectomy is a method of crystalline lens extraction frequently employed for patients with inherited cataracts, complicated cataracts, ectopia lentis, or vitreoretinal pathology with cataract. Lens extraction has been described with the use of a microvitrector in 20- and 23-gauge vitrectomy, and ultrasonic fragmentation (fragmatome) may be used through a 20-gauge sclerotomy if required by presence of cataract. Multiple techniques have been described, including combined-gauge incisions with 25-gauge instrumentation and various pars plana and limbal lens extraction techniques. The authors have recently employed a consistent approach that provides minimal invasiveness and is suitable for all lens densities.

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Typical 25-gauge transconjunctival trocar- or cannula-based three-port vitrectomy is initiated using standard technique. Initially, a flat irrigating contact lens is used to perform anterior vitrectomy and assess the view to the posterior segment. A primary capsulotomy is performed under retro-endoillumination and direct external visualization. A primary capsulotomy is performed under retro-endoillumination and direct external visualization (Figure). A 27-gauge needle on a 3-mL syringe with balanced salt solution is used to hydroshear the lens nucleus, evident by an anterior subcapsular fluid wave. The lens is then approached posteriorly with the microvitrector and lens substance illuminated with equatorial, lateral endoillumination. Initially, a central groove is attempted with the microvitrector. This maneuver allows assessment of lens density. If the lens substance...
cannot be removed with the microvitrector alone, a limited superotemporal conjunctival peritomy incision is made, and a 20-gauge sclerotomy is made 3 mm posterior to the limbus. The lens is then removed with a fragmatome, with the intraocular pressure compensated infusion set to 60 mm Hg and lateral endoillumination. If a fragmatome is used, the lens substance is approached through the posterior capsulotomy, rather than through the lens equator, in an attempt to preserve as much capsular integrity as possible. The goal in this scenario is to remove as much lens as possible prior to dislocating the lens fragments into the posterior segment, sparing the anterior lens capsule (video available at http://www.healio.com/OSLIRetina).

The authors recently employed this technique in 68 cases requiring lensectomy over an 18-month period. A fragmatome was used in 31 cases. Retinal breaks were present and were treated with endolaser retinopexy in six cases, all of which had traumatic lens dislocation as the reason for requiring pars plana lensectomy and had breaks documented preoperatively. No iatrogenic retinal breaks were encountered. Lens capsule was successfully spared in all cases without primary zonular dehiscence (48 cases). No postoperative retinal detachments due to new retinal breaks were observed.

**DISCUSSION**

Pars plana lensectomy has long been employed as a method of lens extraction, particularly for traumatic lens dislocation and in patients with cataract and combined vitreoretinal pathology. The need for removal of lens material is often considered an indication for larger-gauge vitrectomy that may involve sclerotomies, requiring suturing and increased operating time. While it may be difficult in some cases to assess the preoperative lens density, the technique described herein allows a consistent approach to all cases requiring lens extraction. A 20-gauge sclerotomy is initiated only if lens material is difficult or impossible to remove with the microvitrector in a reasonable time period. In this manner, a large sclerotomy requiring suturing is performed only for the lens extraction and immediately closed after this portion of the procedure. This limits the intraoperative duration of a large sclerotomy and may decrease the possibility of peripheral vitreous or retinal incarceration.

The described technique involves consistent preservation of the anterior lens capsule for any lens density with intact zonules preoperatively. This allows maintenance of a two-chamber eye during vitreoretinal procedures performed in the combined setting, even if the patient is left aphakic. Although it is difficult to directly visualize the posterior capsulotomy
during lens removal, we have not experienced anterior propagation of posterior radial capsular tears. Furthermore, we have not experienced premature dislocation of lens material during hydrodissection. This is one theoretical reason for maintaining a relatively small posterior capsulotomy during hydrodissection. In the context of a known retinal detachment with primarily rhegmatogenous pathology for which ultrasonic lens fragmentation is planned, we still prefer an anterior approach. This avoids the need for the high flow rates often required for lens fragmentation and aspiration in the posterior segment and avoids large-gauge sclerotomies that may increase the risk of iatrogenic breaks and retinal incarceration. Nevertheless, we have found that a planned pars plana vitrectomy with lensectomy for most cases results in favorable anatomic and visual results and may allow for primary or delayed intraocular lens implantation.

REFERENCES