Transconjunctival 25-gauge Surgery for Diabetic Traction Retinal Detachment

Results with sutureless technique compare well with 20-gauge.

BY JOHN O. MASON III, MD

The number of people with diabetes in the United States has almost tripled in the past quarter century, growing from 5.6 million in 1980 to 15.8 million in 2005.[1] Diabetes is the leading cause of new blindness in adults in this country between the ages of 20 and 74.[2] The National Eye Institute estimates that more that 5.4 million Americans have diabetic retinopathy.[3] People 65 years of age or older account for approximately 38% of the population with diabetes,[1] so as the population continues to age, the prevalence of diabetes and diabetic retinopathy may be expected to continue to increase.

Diabetic traction retinal detachment (TRD) is a complication of advanced proliferative diabetic retinopathy. It has historically been treated using pars plana vitrectomy with 20-gauge instrumentation.[4-7] Recently, 25-gauge instrumentation has become available, offering the possibility of performing vitreoretinal surgical procedures through smaller-diameter, self-sealing wounds. Potential benefits of this instrumentation include less traumatic manipulation of the sclera and conjunctiva, less inflammation postoperatively, less induced corneal astigmatism, and more rapid visual recovery after surgery.[8,9]

My colleagues and I performed a retrospective study to evaluate the visual and anatomic outcomes in my first 100 cases using 25-gauge vitrectomy for diabetic TRD.[10] We reviewed 100 consecutive eyes in which 25-gauge vitrectomy was performed for treatment of diabetic TRD from March 2005 through June 2006.

Three-port pars plana vitrectomy was performed with the Accurus (Alcon, Fort Worth, Texas) 25-gauge vitrectomy system. The vitreous cutter was used to remove as much central and peripheral fibrovascular membrane as possible. All eyes appeared to be free of residual retinal traction at the conclusion of surgery, and all eyes underwent extensive intraoperative laser retinopexy. In cases with iatrogenic retinal breaks, gas or silicone tamponade was employed.

RESULTS

Mean follow-up was 14 months (range, 8 to 24 months). Preoperatively, mean best corrected visual acuity (BCVA) was 20/240; at final follow-up it was 20/72. BCVA remained stable or improved in 88% of patients. BCVA decreased by two or more lines in 12%. Seventy-four eyes achieved a final BCVA of 5/200 or better, and more than half (55%) achieved 20/100 or better.

Anatomic reattachment was successfully achieved in 96% of cases. Gas tamponade was needed in 15% of eyes and silicone oil in 5%. In four patients the retina remained detached at final follow-up, and in these eyes the visual results were poor—hand motion or light perception.

Complication rates were low. Three eyes had recurrent vitreous hemorrhage, one developed neovascular glaucoma, and five experienced rhegmatogenous retinal detachment and proliferative vitreoretinopathy. One of the five was reattached with second surgery.

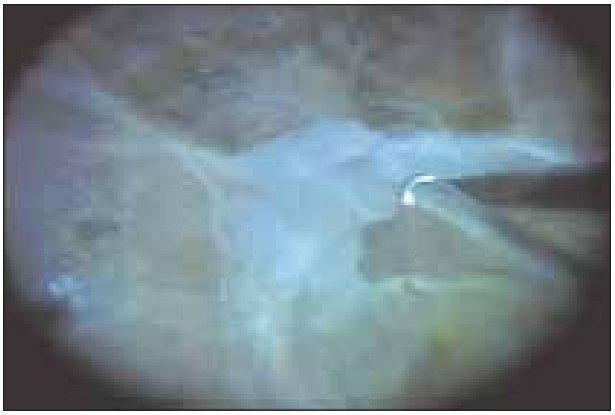

Figure . The port of the 25-gauge instrument is closer to the tip, allowing easier excision of fibrovascular membranes.

DISCUSSION, CONCLUSIONS

Results with 25-gauge vitrectomy were compared with previous reports in the literature of results with 20-gauge vitrectomy for diabetic TRD.[7,11-28]

With 20-gauge vitrectomy, vision in patients with diabetic TRD was stable or improved after surgery in 55 to 89% of eyes. Our series using 25-gauge, with 88% stable or improved, compared favorably with these results. With 20-gauge vitrectomy, BCVA of 5/200 or better was achieved in between 22% and 77% of eyes. Again, with 74% achieving 5/200 or better, our 25-gauge vitrectomy results compared favorably. Anatomic reattachment was achieved in 96% of eyes, which compares favorably with recent reports for 20-gauge surgery.

Complication rates with 25-gauge vitrectomy were generally lower than those reported in the literature with 20-gauge instrumentation. Three eyes (3%) in our series developed recurrent vitreous hemorrhage, while the 20-gauge literature reports 12% to 19%. Five eyes (5%) in our series developed postoperative rhegmatogenous retinal detachment, compared with 7% to 16% with 20-gauge. One patient (1%) in our series developed neovascular glaucoma, compared with 5% to 23% of eyes in the 20-gauge literature. There was a 25% rate of iatrogenic retinal tears or retinectomies, within the range reported in the 20-gauge literature (16%–35%).

There are a number of advantages with 25-gauge technology that may have contributed to our good results in this series of surgeries for diabetic TRD. The port on the 25-gauge vitrector is closer to the tip than on 20-gauge instruments, which improves fluidics and allows excision of fibrovascular membranes on the retinal surface. With the larger 20-gauge instrumentation, it was necessary to use scissors or forceps to remove scar tissue, but now the cutter itself can perform this function (Figure). In addition, with the smaller tip, the port closer to the tip, a faster cut rate, and a lower flow rate, there is less retinal movement. This allows easier removal of fibrovascular membranes, with the potential in the future for fewer iatrogenic breaks.

In conclusion, this series demonstrated that 25-gauge vitrectomy resulted in improved visual function and a high rate of anatomic reattachment in patients with diabetic TRD. Results were as good as or better than the reported results with 20-gauge vitrectomy for diabetic TRD. ■

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