

Microincisional Vitrectomy Surgery in Japan: An Update

BY YUICHIRO OGURA, MD

Microincisional vitrectomy surgery (MIVS) has become popular worldwide as an alternative to conventional 20-gauge vitreous surgery. In the early days, there were reports of several disadvantages of MIVS, such as poor cutting efficacy, improper wound sealing, excessive flexibility of the instruments, and higher incidence of postoperative endophthalmitis. However, advances in instrumentation and surgical technique resulted in more widespread use of MIVS for almost every situation and improved surgical outcomes. The same transition to MIVS has occurred in Japan. According to a recent survey, more than 70% of vitreous surgeons in Japan were using MIVS with either 25-gauge or 23-gauge instrumentation in 2010 (Figure 1), with 23-gauge being most popular. I expect, however, that more surgeons have shifted to 25-gauge in 2011 because of the recent availability of the Constellation Vision System (Alcon, Fort Worth, TX). Because Japan has strict rules for the approval of medical devices and pharmaceuticals, we must often wait several years past the time that instruments and pharmaceuticals

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become available in other regions of the world. I have been using a 25-gauge system, however, for almost 100% of my cases for several years.

COMBINED PROCEDURES

Combined procedures with cataract surgery and vitrectomy are popular in Japan because previous studies have demonstrated that nuclear cataract progression after vitrectomy is common in older patients.^{1,2} Vision-threatening nuclear cataract develops within 1 to 2 years after vitreous surgery in most patients aged 50 years or older (Figure 2), so we

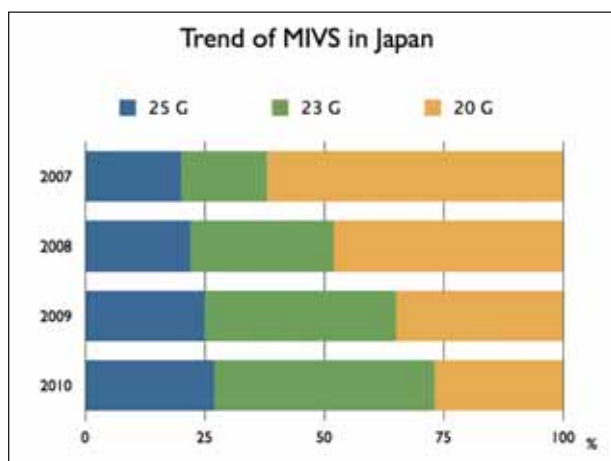


Figure 1. Use of MIVS in Japan has increased in recent years.

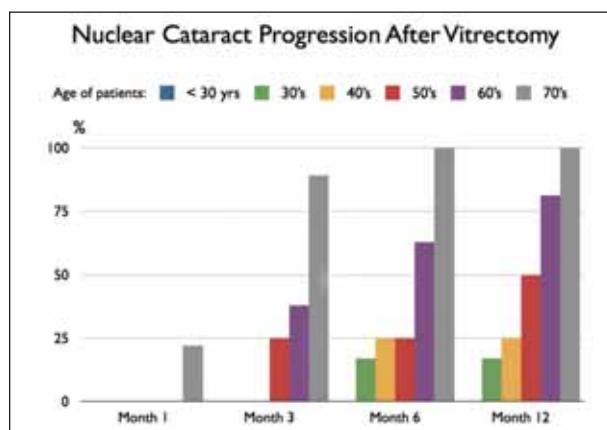


Figure 2. Incidence of nuclear cataract progression after vitrectomy according to ages of patients.

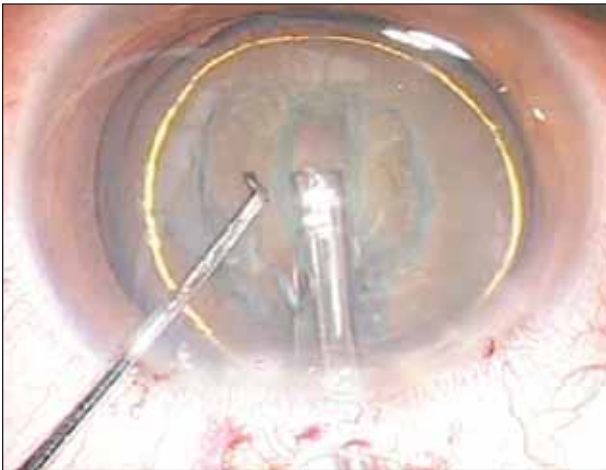


Figure 3. Limbal approach is the most popular technique for combined procedures.

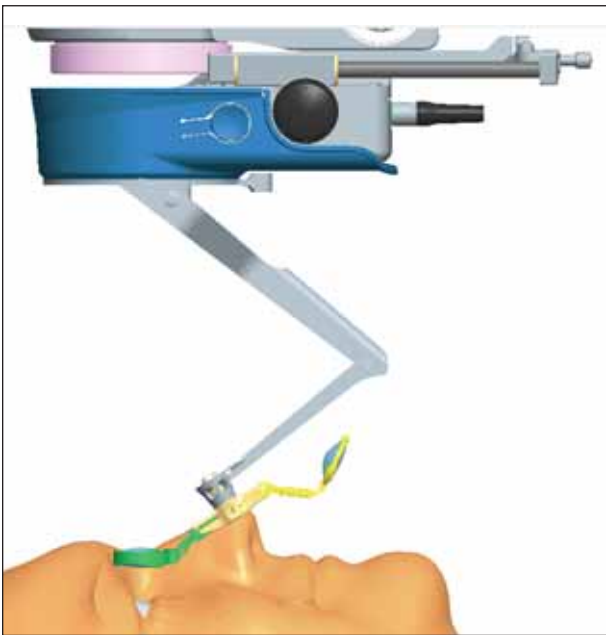


Figure 5. Resight wide-angle viewing system from Carl Zeiss Meditec.

routinely perform combined procedures for this group of patients. Another reason is that ophthalmologists in Japan are not as specialized as in United States, and so, although my specialty is retina, I also perform cataract and glaucoma procedures.

A corneal or corneoscleral incision is my favorite approach for phacoemulsification (Figure 3). The intraocular lens (IOL) is implanted in the capsular bag as in standard cataract surgery. I prefer to implant the IOL prior to vitrectomy, but some surgeons implant the IOL after vitrectomy. Pars plana

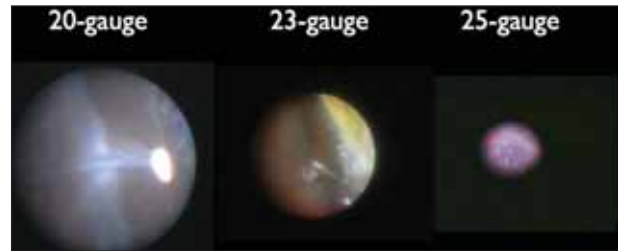


Figure 4. Comparison of endoscopic images with different gauges.

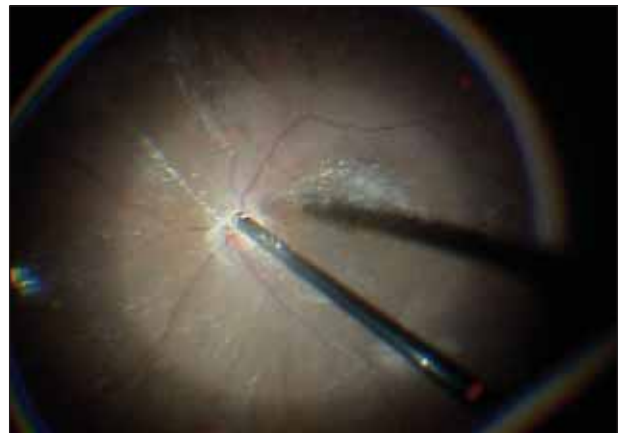


Figure 6. Wide-angle viewing allows an efficient MIVS.

lensectomy with a fragmatome is an uncommon procedure in our country.

VISUALIZATION IN MIVS

The endoscope is useful for certain situations during vitrectomy, including cloudy corneas, impaired visualization during surgery, and when surgical manipulation of the ciliary body and far peripheral retina is necessary. I frequently use an endoscope when I perform 20-gauge surgeries, and I find it to be useful. I have developed prototypes of small-gauge endoscopes for MIVS, and although it is possible to get a view of retina with the small gauge endoscope, the quality of images is poor because of limited numbers of fibers in the small-gauge endoscope probes (Figure 4).

The Resight wide-angle viewing system (Carl Zeiss Meditec, Dublin, CA), a noncontact wide-angle viewing system specifically designed for the Zeiss microscope (Figure 5), has become very popular in Japan. The system has 2 lenses for different angles that are easily changeable during surgery. The microscope foot switch provides control of the viewing angle, zooming, and focusing (Figure 6). It is necessary to rotate the eyeball with vitrectomy instruments to see the peripheral fundus with a contact lens viewing system, and we are accustomed to rotating the eyeball with stiff

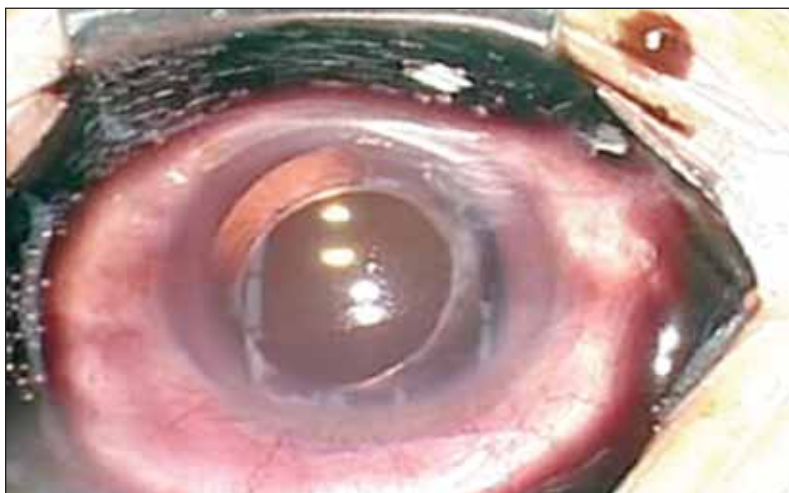


Figure 7. Irrigation with 1.25% povidone-iodine solution reduces bacterial contamination during surgery

20-gauge instruments. Because MIVS instruments are more flexible, however, rotating the eye can present a significant challenge. The wide-angle viewing system provides a good view of peripheral fundus without the need to rotate the eye.

ENDOPHTHALMITIS AFTER MIVS

Early reports suggested that the rate of infectious endophthalmitis was significantly higher with small-gauge surgery than with conventional 20-gauge vitrectomy. Kunitomo and Kaiser³ reported the incidence of endophthalmitis was 0.226% and Scott et al⁴ reported the incidence was 0.842%. Oshima et al⁵ performed the survey to investigate the incidence of endophthalmitis after vitrectomy with various gauges in Japan. The results of this multicenter survey showed that endophthalmitis rates were 0.034% (10 cases out of 29 030 eyes) after 20-gauge vitrectomy and 0.054% (8 cases out of 14 838 eyes) after MIVS. There was no significant difference among the groups. Another study from Japan also found no significant difference in the incidence of endophthalmitis after 20-gauge and 25-gauge vitreous surgery. Shimada et al⁶ studied the incidence of endophthalmitis in 3592 consecutive eyes that underwent 20-gauge vitrectomy and in 3343 eyes that received 25-gauge vitrectomy. They found that only 1 eye developed endophthalmitis in each group. The incidence of endophthalmitis was 0.0278% for the 20-gauge vitrectomy group and 0.0299% for the 25-gauge vitrectomy group. The difference was not significant. They also noticed that a straight incision was used in the 1 case that developed endophthalmitis after 25-gauge vitrectomy and none developed endophthalmitis with an angled incision.

Shimada et al⁷ recently reported that intraoperative irrigation of the operative field with diluted povidone-iodine solution further decreased bacterial contamination during vitreous surgery as well as cataract surgery. They recommended irrigation of the operative field with 1.25% povidone-iodine solution before performing trocar insertion and/or continuous surface irrigation with 0.25% povidone-iodine solution during surgery (Figure 7).

SUMMARY

Now that 23-gauge and 25-gauge technologies are fully available in Japan, more surgeons will most likely transition to this technique. The research that has been done to reduce postoperative endophthalmitis will increase the comfort level of surgeons who choose to perform MIVS. ■

Yuichiro Ogura, MD, is Professor and Chairman of the Department of Ophthalmology and Visual Science, Nagoya City University Graduate School of Medical Sciences in Nagoya, Japan. He can be reached via email at vitreous.surgeon@gmail.com.

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