# 23-Gauge Surgery Replaces 20- or 25-Gauge — in Most Cases

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**BY CLAUS ECKARDT, MD**

I never became accustomed to the routine use of 25-gauge transconjunctival vitrectomy for two main reasons. In my opinion, and in my hands, the instruments are too flexible and many are too small to be sufficiently effective.

Therefore, 3 years ago, I developed a 23-gauge system (Dutch Ophthalmic Research system [DORC], Zuidland, Netherlands). Using this system, the scleral tunnel is prepared using a stiletto blade and only little additional force is necessary to insert the cannula. When the 23-gauge cannula is removed from the sclera, it gives a nice outer aspect to the usually watertight incision, compared with removal of the 25-gauge cannula, which leaves an oval-shaped hole. Figure 1 shows three sizes of cannulae.

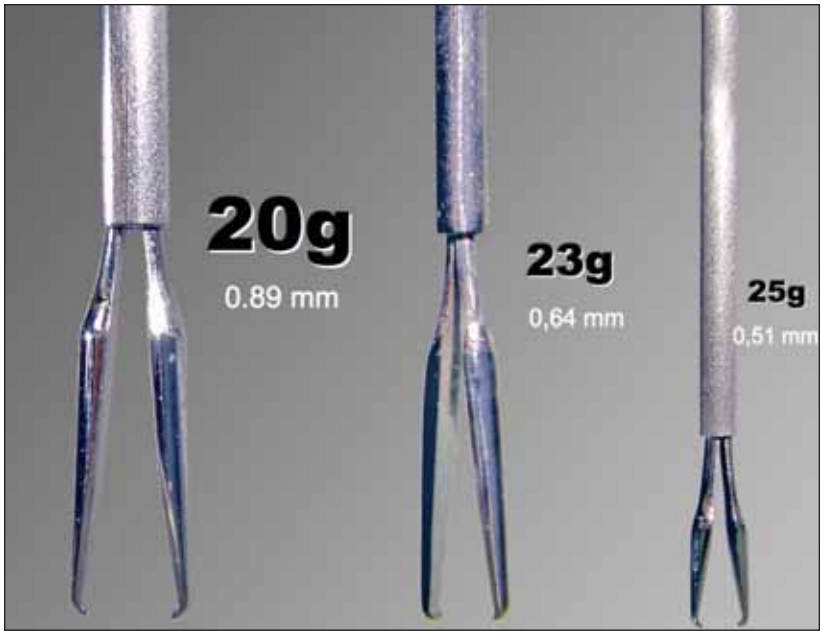


**Figure 1. The difference between 20-, 23- and 25-gauge transconjunctival vitrectomy forceps is shown here.**

We use a pressure plate as part of the 23-gauge system to deal with the mobile conjunctiva. Our original technique of using a blade to create a tunnel incision, the first step in the procedure, has to its advantage that the cannula is inserted smoothly. There is, however, an additional cost for the knife. We have developed a 23-gauge sharp trocar that will be used instead of the original blunt insert. The surgeon must apply a little more force to insert it, depending on the mobility of the globe.

## TANGENTIAL INSERTION SUPERIOR

Using pig eyes and a spring scale, we examined how well the 23-gauge cannulas are held by the sclera. We discovered that a tangential insertion is far superior to a perpendicular one. The optimal cannula would be one containing a valve system preventing the loss of intraocular fluid when the surgeon switches instruments. The resistance from the valve should also be as low as possible to ensure that the

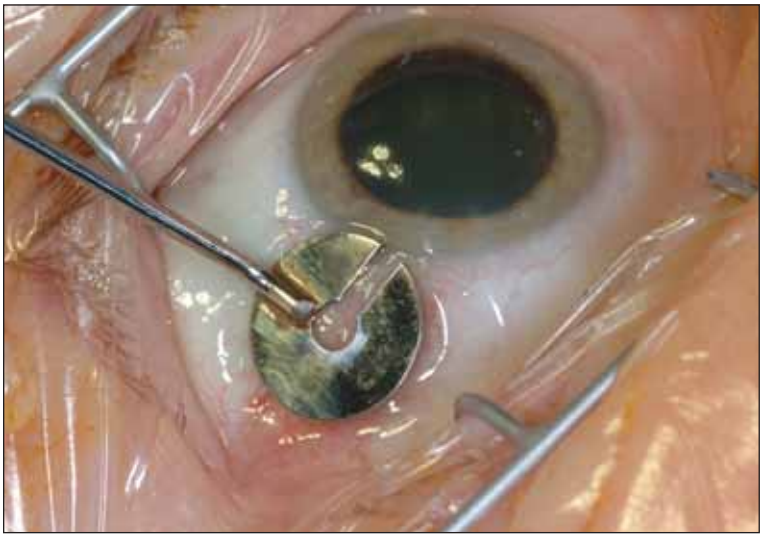

**Figure 2. The pressure plate is used to fixate the conjunctiva at the sclera during the incision and cannula insertion procedure.**

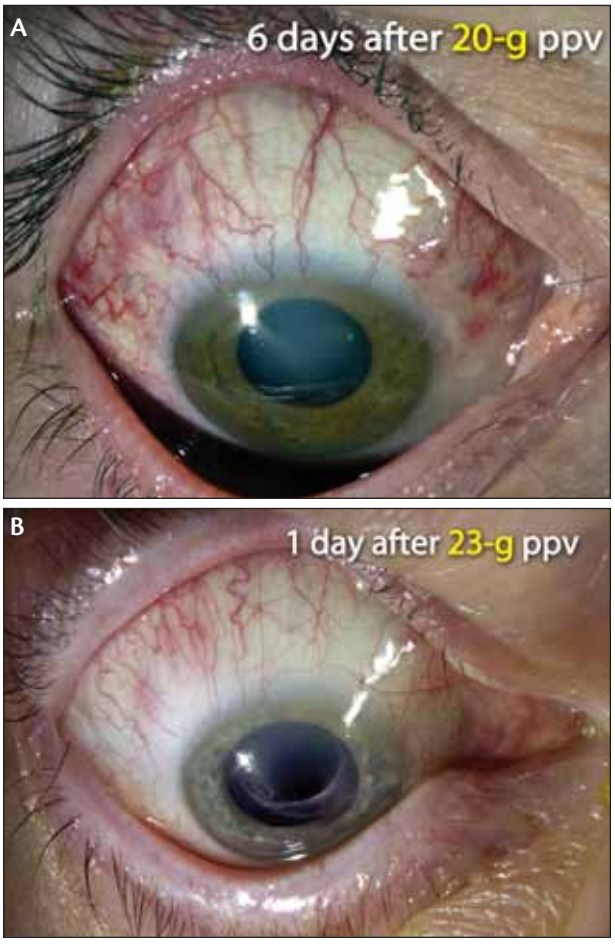


**Figure 3. The top photo (A) shows an eye 6 days postop pars plana vitrectomy with 20-gauge instrumentation. Bottom photo (B) is 1-day postop with 23-gauge pars plana vitrectomy.**

cannula is not inadvertently removed. DORC now produces such a cannula and valve set. Another device that functions as part of this 23-gauge system is the DORC Twinlight Endoillumination System, which is made of two 27-gauge fibers. In combination with the DORC Xenon Brightstar illumination system, bimanual surgery is no longer a problem.

I am convinced that the maximum benefit of all transconjunctival vitrectomy techniques can only be obtained if the instrumentarium allows us to perform surgery even on the most difficult cases, because difficult cases often need several interventions.

## CLINICAL RESULTS

Between January 2005 and June 2006, five surgeons in our department operated on >600 patients. The 23-gauge technique was used approximately 95% of the time. Figure 2 shows the pressure plate used to fixate the conjunctiva.

With regard to complications, we had only two cases of postoperative hypotony, and these were in a 15-year-old and 12-year-old patient. In none of the cases did we have to convert to 20-gauge surgery, and none required suturing of the sclerotomies. We had two cases of endophthalmitis that occurred at the beginning of 2005. After these we switched to using disposable 23-gauge cannulas, and we have not had another case of endophthalmitis.

The advantages of 23-gauge surgery over 25 gauge are that you (1) can use it in even the most difficult cases and (2) very rarely lose cannulas. There is rapid closure of sclerotomies; that means that there is possibly a lower risk of postoperative hypotony, a lower risk of hemorrhage and a lower risk of endophthalmitis. Additionally, the instrumentarium for 23-gauge surgery is effective.

As we found in our practice, transconjunctival scleral tunnel incisions created for 23-gauge instruments guarantee an almost 100% rapid self-sealing closure of sclerotomies. Due to its wide range of applications, 23-gauge vitrectomy may be used in place of conventional 20-gauge vitrectomy in most causes (Figure 3). ■

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