

A SIMPLIFIED TECHNIQUE FOR IN-OFFICE TAP AND INJECTION FOR ENDOPHTHALMITIS



A single 27-gauge trocar-cannula port can be used to tap and inject.

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Acute endophthalmitis is a vision-threatening ophthalmic emergency requiring prompt management. Options, depending on severity and concurrent ocular morbidities, include in-office vitreous tap with antibiotic injection or surgical vitrectomy. In an office setting, tap and inject is performed under topical or local anesthesia and typically requires three needle penetrations of the globe: one for the tap and two for injection of two different antibiotics. Sometimes a corticosteroid is injected, necessitating a fourth globe penetration.

These eyes are highly inflamed and uncomfortable due to the underlying endophthalmitis, and patients are anxious because of their condition. Even with topical or subconjunctival anesthesia, the multiple injections can be painful and stressful to the patient.

INDWELLING PORT

What can be done to alleviate this pain and stress and simplify the procedure? We can take a lesson from the situation of patients who require

frequent intravenous infusions. Instead of starting a new intravenous line for each subsequent infusion, an indwelling catheter is placed, eliminating the need for multiple venipuncture procedures.

Working on this model, clinicians have conceived the idea of a temporary indwelling port in the eye to facilitate a vitreous tap and multiple injections with only one initial needle-based globe penetration. In this

approach, the trocar-cannula system used in modern vitrectomy systems is analogous to an intravenous port. It is placed once, and the eye can be injected through the cannula multiple times without requiring additional needle penetration of the globe. Once the tap and inject procedure is completed, the cannula can be easily removed, and the incision is self-sealing just as it is in vitrectomy surgery.

AT A GLANCE

- In an office setting, tap and inject for endophthalmitis is performed under topical or local anesthesia and typically requires three needle penetrations of the globe. Despite anesthesia, the multiple injections are painful and stressful to the patient.
- Previously, authors have described the use of a 25-gauge trocar-cannula as a port to eliminate the need for multiple punctures of the globe.
- The current authors present their technique and rationale for using a 27-gauge trocar-cannula for this purpose.

Chan et al first described the use of a 25-gauge trocar-cannula to allow vitreous tap and antibiotic injection all through the cannula, requiring only one needle penetration of the globe.¹ Vahedi et al subsequently reported a series of patients comparing this technique against a traditional vitreous tap and inject technique.² They measured patient comfort and physician ease or difficulty with the procedure, as well as the success of vitreous sampling and the microbiologic yield. They found no differences with the 25-gauge trocar-cannula system compared with traditional tap and inject.

ONE STEP FURTHER: CASE REPORT

We took the technique one step further, using a 27-gauge trocar-cannula for vitreous tap and injection, under the assumptions that the smaller needle penetration in an already painful eye would be better tolerated by patients and that the smaller incision should self-seal better than a larger incision.

A 66-year-old man presented with signs and symptoms of infectious endophthalmitis several days after cataract surgery with IOL implantation. Vitreous tap and injection was recommended. Because his eye was painful, we suggested using a 27-gauge trocar-cannula to minimize the discomfort associated with multiple globe penetrations.

The patient was anesthetized in standard fashion for an intravitreal injection, with 4% lidocaine gel plus subconjunctival 2% lidocaine applied at the injection site. A lid speculum was placed in the eye. The conjunctiva was displaced with a cotton-tipped applicator, and the 27-gauge trocar-cannula was inserted into the globe in a direct, perpendicular fashion (Figure 1). The patient experienced mild discomfort consistent with a large injection, such as for a long-acting corticosteroid implant.

Through the cannula, a vitreous tap was performed using a short 27-gauge needle, followed by standard injections of intravitreal vancomycin and ceftazidime (Figure 2). The cannula was then removed with toothed forceps, followed by gentle wound massage to facilitate wound closure and conjunctival coverage of the incision site.

Despite collection of a small but adequate vitreous sample, the laboratory reported no microbiologic growth. The patient's posttreatment course was unremarkable, and his endophthalmitis resolved.

SMALLER IS BETTER?

Although this is only a single case report, it demonstrates the feasibility of using a 27-gauge trocar-cannula system for in-office management of acute endophthalmitis. It should be noted that, although retina surgeons are comfortable and familiar with trocar-cannula insertion and removal, this might not be the case for general ophthalmologists or medical retina specialists, who may therefore prefer a traditional vitreous tap and inject technique.

Advantages of the 27-gauge system include the creation of a smaller scleral wound with potentially less patient discomfort



Figure 1. The 27-gauge trocar-cannula port is inserted perpendicular to the sclera.



Figure 2. Antibiotics are injected using the 27-gauge port.

compared with a 25-gauge trocar-cannula. In the 25-gauge trocar study by Vahedi et al,² a beveled trocar insertion technique was used to minimize risk of wound leak after trocar removal. Because no differences in patient comfort were found in this study comparing the trocar technique with standard vitreous tap and injection of antibiotics, the authors theorized that the increased force required to insert the 25-gauge trocar in a beveled fashion negated the reduction in discomfort achieved by reducing the number of scleral penetrations.

When Shimada et al compared 25-gauge trocar incisions made direct and perpendicular to the sclera with angled incisions made with the same gauge, they found a significantly increased rate of wound leak and hypotony with the straight incisions.³ By contrast, a comparison of straight and beveled 27-gauge trocar incisions showed them to have similar, low rates of postoperative wound leak.⁴ With less force required to insert a 27-gauge trocar cannula and high wound integrity, the advantages of a 27-gauge over a 25-gauge technique becomes evident.

Trocar-cannulas are available in 23-, 25-, and 27-gauge sizes from major vitrectomy equipment companies at a

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cost of about \$100 per unit. They are disposable and available as a single unit in a sterile pack, making them easy to stock in the office.

Disadvantages of a smaller-gauge cannula include the potential for greater difficulty in obtaining an adequate vitreous sample. However, inserting the needle through a cannula allows the needle to be moved back and forth easily, if needed, to find a pocket of liquid vitreous for sampling. Another disadvantage is the added cost of the disposable trocar-cannula compared with traditional tap and inject using syringes and needles.

MORE EFFICIENT, LESS PAINFUL

This report is not able to make any comparison between 25-gauge and 27-gauge approaches other than demonstrating the feasibility of effectively using the smaller gauge trocar-cannula and outlining the theoretical benefits of the smaller incision, including less patient discomfort and less potential for wound leak.

The trocar-cannula approach to tap and inject procedures brings the efficiency of modern vitrectomy techniques to the office setting, providing a safe and efficient technique for managing acute endophthalmitis with potentially less patient discomfort and anxiety. ■

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