

What Is the Role of the Ex-Press Mini Glaucoma Shunt in Your Practice?

BY MALIK Y. KAHOOK, MD, AND ROBERT J. NOECKER, MD, MBA

Question submitted by Christopher Russo, MD, a first-year resident, ophthalmology, University of Colorado.

Guarded filtration surgery in the form of trabeculectomy has long been the gold standard for penetrating glaucoma surgery. Despite ophthalmologists' long experience with trabeculectomy, modifications or improvements to the procedure have been few since its first description by Cairns in 1968.¹ Approved by the FDA in 2003, the Ex-Press mini glaucoma shunt (Optonol Ltd., Zug, Switzerland) is designed to limit aqueous flow through a tube with a uniform internal diameter of 50 μ m (Figure 1) and thus, theoretically, result in less hypotony or underfiltration and a more predictable postoperative course compared with traditional trabeculectomy.

Initially, Optonol Ltd. recommended that surgeons implant the Ex-Press device under the conjunctiva alone, but complications occurred frequently, including early profound hypotony with later conjunctival fibrosis and extrusion of the device.² More recently, several investigators have recommended implanting the device under a scleral flap, and the company has modified the device in an attempt to increase successful surgical outcomes.³

In our practices, the patient selection process for the Ex-Press device is similar to that for trabeculectomy surgery. Candidates do not exhibit excessive conjunctival scarring, and their IOP is not satisfactorily controlled on maximal medical therapy and/or with laser trabeculoplasty. More prospective studies are needed to tease out the differences between these procedures before concrete and distinct recommendations can be made on patient selection. Our decision to perform a standard trabeculectomy versus implant the Ex-Press device is therefore evolving.

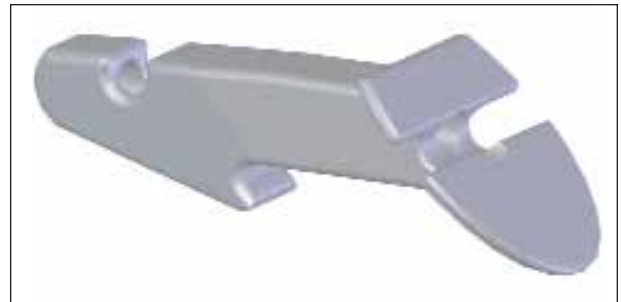


Figure 1. The Ex-Press mini glaucoma shunt model X.

TECHNIQUE

As noted earlier, the device is implanted under a partial-thickness scleral flap. We begin by completing a superior peritomy and a generous dissection underneath Tenon's capsule posteriorly and into the nasal and temporal quadrants. Next, we dissect a triangular or trapezoidal scleral flap of 50% thickness to the limbus and broadly apply mitomycin C 0.2 to 0.4 mg/mL via soaked collagen shields over the sclera for approximately 2 minutes. After removing the collagen shields and flushing the remaining mitomycin C away from the surgical field, we enter the anterior chamber with a 27-gauge needle passed under the scleral flap, 1.0 to 1.5 mm posterior to the surgical limbus. Placing Healon (Advanced Medical Optics, Inc., Santa Ana, CA) in the anterior chamber through a temporal paracentesis depresses the iris away from the site to allow the device's implantation. It is important to emphasize that we inject the Healon after creating the 27-gauge tunnel so as to avoid alterations to the anatomy that could lead to our misjudging the ultimate position of the Ex-Press device.

After instilling Healon, we advance the device through the scleral tunnel and ensure that the device is secure and flush with the surrounding sclera. Following the closure of

the scleral flap with 10–0 nylon sutures, we reapproximate the conjunctiva and secure it with 9–0 Vicryl sutures (Ethicon Inc., Somerville, NJ). We leave a small amount of Healon in the anterior chamber to avoid early postoperative hypotony, and we hydrate the paracentesis to ensure it is watertight.

Follow-up care is similar to that for trabeculectomy, although we generally see less early inflammation and greater posterior flow after the implantation of the Ex-Press device. We prescribe prednisolone acetate, atropine 1%, and antibiotic drops q.i.d. and titrate them during follow-up visits.

OUTCOMES

In the past, the Ex-Press mini glaucoma shunt was implanted under the conjunctiva without the use of a scleral flap. This procedure led to an increased rate of hypotony and choroidal effusions as well as the device's extrusion through the conjunctiva.^{4,5} Recently, Maris and colleagues retrospectively evaluated the differences between the Ex-Press device implanted under a partial-thickness scleral flap compared with traditional trabeculectomy in 100 patients.⁶ The investigators defined success as an

IOP of between 5 and 21 mm Hg with or without glaucoma medications and without further glaucoma surgery or removal of the implant. The average follow-up period was 10.8 months and 11.2 months for the Ex-Press and trabeculectomy groups, respectively. The researchers noted that the mean IOP was higher in the early postoperative period in the Ex-Press group, but it was similar in both groups after 3 months. Early postoperative hypotony and choroidal effusions were less frequent in patients who received the device versus a trabeculectomy ($P<.001$). Still, longer-term follow-up is needed to better understand the complication profile associated with the use of this device compared with trabeculectomy.

In our experience, profound hypotony and choroidal effusions seem to occur less frequently in the early postoperative period with the Ex-Press device compared with trabeculectomy. The flow-limiting internal ostium of the implant appears to allow aqueous to egress out of the anterior chamber in a more controlled fashion compared with standard trabeculectomy. As a result, shifts in IOP are less abrupt, and the chance of the anterior chamber's collapsing is lower. Additionally, obviating the need for a sclerectomy and iridectomy often translates as less inflammation and bleeding and increased comfort for the patient postoperatively. Those of our patients who receive the Ex-Press device seem to regain their preoperative visual acuity faster, and their blebs tend to be lower and more posterior than after trabeculectomy. Additional prospective data are required to support these observations. □

COMPARING THE PROS AND CONS

Malik Y. Kahook, MD, and Robert J. Noecker, MD, MBA, describe the comparative advantages and disadvantages of the two procedures based on their experience.

Advantages of the Ex-Press device compared with traditional trabeculectomy

- Decreased surgical time (although early models of the device take longer to load than the current version)
- Predictability during the early postoperative period. The size of the device's opening potentially allows for more reproducibility compared with a trabeculectomy punch
- Less inflammation. Minimizing cutting into the anterior chamber and avoiding the creation of a surgical iridotomy appear to lessen postoperative bleeding and inflammation

Disadvantages of the Ex-Press device compared with traditional trabeculectomy

- The Ex-Press device is a metallic foreign body implanted in the eye, which may lead to complications such as the device's extrusion or migration into the eye. Theoretically, the device may represent a nidus for infection
- Additional material expense over trabeculectomy alone
- Limited prospective, long-term data

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