

Ahmed vs Baerveldt: Which Is the Better Shunt?

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Treatment Outcomes in the Ahmed Baerveldt Comparison Study After 1 Year of Follow-up

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Study Summary

The use of aqueous shunts for the management of refractory glaucoma is increasing compared with trabeculectomy. The number of shunts being placed increased 184% from 1995 to 2004. Commonly used aqueous shunts include the Ahmed™ glaucoma valve (AGV) and the Baerveldt® glaucoma implant (BGI). Specific aqueous shunts are chosen for various reasons, including perceived efficacy in controlling intraocular pressure (IOP), perceived risks for complications, and ease of implantation. Several retrospective studies comparing success rates and complications of the AGV with those of the BGI in refractory glaucoma have been inconclusive and suffered from selection bias. The Ahmed Baerveldt Comparison (ABC) Study was designed to prospectively compare the safety and efficacy of these 2 commonly implanted glaucoma drainage devices.

The ABC Study was conducted at 16 clinical centers and included surgeons with varying levels of experience with the 2 implants. Individuals enrolled in the study were randomly assigned to placement of an AGV model FP7 or a 350-mm² BGI. Of the 276 enrolled patients, 143 were randomly assigned to the AGV group and 133 to the BGI group. The primary outcome was failure, defined as IOP \geq 21 mm Hg or not reduced by 20% from baseline, IOP \leq 5 mm Hg, reoperation for glaucoma or removal of the implant, or loss of light-perception vision. Secondary outcomes included mean IOP, visual acuity, use of supplemental medical therapy, and complications.

Preoperative IOP was 31.2 ± 11.2 mm Hg in the AGV group and 31.8 ± 12.5 mm Hg in the BGI group. At 1 year, mean IOP was 15.4 ± 5.5 mm Hg in the AGV group and 13.2 ± 6.8 mm Hg in the BGI group, a statistically significant difference. The cumulative probability of failure was 16.4% in the AGV group and 14.0% in the BGI group at 1 year, which was not statistically significant. More patients in the BGI group experienced early postoperative complications (58%) than in the AGV group (43%); the difference was statistically significant. Serious postoperative complications associated with reoperation, vision loss, or both occurred in 29 patients (20%) in the AGV group and in 45 patients (34%) in the BGI group.

Viewpoint

Over the past few years, glaucoma shunts have been increasing in popularity. The 2 most commonly used shunts in the United States are the AGV and the BGI. The AGV is a valved implant that ideally opens at a pressure of 8 mm Hg, reducing the risk for hypotony that would result from unrestricted flow. The BGI is a nonvalved implant that is routinely modified during surgery to prevent initial postoperative hypotony. The most commonly used AGV has an end

plate surface area of 184 mm², whereas the BGI's has a surface area of 350 mm². Both the larger surface area and the absence of a valve in the BGI should presumably lead to a lower IOP. It should also potentially lead to higher complication rates from hypotony and risks for diplopia and exposure due to its larger size. Surgeons who are inexperienced with the BGI may also find it more technically challenging to implant because of its larger size, which requires isolation of the rectus muscles and placement of the wings of the end plate behind the muscles. This challenge, along with the unpredictability of the IOP immediately after surgery, may be a reason that surgeons often turn to the AGV first. Yet, if long-term success rates are better with the BGI, the paradigm should be shifted and surgeons should become more comfortable with the BGI. Thus, the initial results of this study are very helpful in allowing surgeons to determine which implant is appropriate for a particular patient.

This study found that 1 year after surgery, IOP is lower with the BGI by about 2 mm Hg, which was statistically significant. In patients for whom achieving the lowest possible IOP is crucial, the BGI may be the better implant to use. Conversely, the rate of complications, both early and later, was higher in the BGI group by about 15%. Therefore, an AGV may be the safer choice. The investigators did note that some of the surgeons participating in the study were inexperienced with 1 of the 2 implants and that those who had performed fewer than 20 surgeries with an implant of any type did have higher complication rates.

In conclusion, this study demonstrated a lower IOP with the BGI, but the cost was a higher rate of complications. Thus, neither implant is a clear choice for all patients or all surgeons. This study is planned to extend for 5 years, and the results of long-term IOP control as well as complication rates may provide more information to guide surgeons in deciding which device to implant.

Abstract

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