

Glaucoma surgery studied in medicare patients, new hope for people

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Ophthalmologists (Eye M.D.s) continue to develop treatments to help the more than three million Americans with glaucoma. The July issue of *Ophthalmology* includes a large, national study of outcomes of incisional surgeries, used to reduce pressure inside the eye, in Medicare patients. Also covered is research that may brighten the outlook for patients with end-stage glaucoma.

All types of glaucoma damage the disc of the eye's optic nerve, compromise the transmission of images to the brain, and eventually result in blindness if untreated. Intraocular pressure (IOP) is a key measurement taken by eye specialists when screening people for glaucoma; IOP is considered elevated when it measures above 21 millimeters of mercury.

In the United States, primary open-angle glaucoma (POAG) is the most common type. Many other Americans have ocular hypertension (OH), a potential precursor to glaucoma, in which fluid pressure within the eye is elevated but optic nerve damage and/or vision loss have not yet occurred. People of African or Hispanic ethnicity have a higher risk of glaucoma, and African-Americans are more likely to progress to end stage glaucoma.

Large-scale Medicare patient study evaluates glaucoma surgeries

The claims records of 14,491 Medicare beneficiaries diagnosed with glaucoma who received one of three incisional surgeries--- primary trabeculectomy (PT), trabeculectomy in the presence of scarring from previous ocular surgery or trauma (TS), or implantation of a glaucoma drainage device (GDD)---between 1994 and 2003 were analyzed by Frank A. Sloan, PhD, and colleagues. "Incisional" indicates that incisions were used to accomplish the procedure. Similar procedures that use laser tools rather than incisions were not assessed in this study. Surgical treatment may be used when IOP medications become ineffective or other factors make surgery the best option. Because some studies had suggested that performing GDD earlier in complicated glaucoma cases might provide benefit with fewer adverse outcomes, Dr. Sloan's group decided to compare GDD to PT and TS outcomes in a large, national Medicare population.

The three surgeries are designed to improve the drainage of fluid from the eye to reduce IOP. In trabeculectomy (both PT and TS), a small portion of the trabecular meshwork is removed to increase fluid flow, and in GDD a tiny implanted shunt is used to bypass the trabecular meshwork and redirect fluid flow. These incisional techniques have benefitted millions of glaucoma patients who otherwise might be blind or have very low vision.

Study patients were at least 68 years of age but not older than 96 during the period analyzed. A number of important case-mix and demographic factors were controlled for by the study design. Patients' Medicare claim records were analyzed to determine post-surgery rates of severe or less severe outcomes, the need for additional glaucoma-related surgery, or progress to low vision or blindness. Records for follow up at one, two, and when available, six years post-surgery were also analyzed.

The study found that, although adverse outcomes were uncommon for all three surgeries, rates of severe outcomes, less severe outcomes, and

progression to low vision or blindness were higher for persons who received GDD than for those who received PT or TS. Also, adverse outcome rates related to trabeculectomy were somewhat higher at six-year follow up than other studies have reported. Patients treated with GDD were more likely to progress to legal blindness. Although the study population was diverse (Medicare patients who represented all areas of the U.S. and a range of ethnicities), the patients treated with GDD were disproportionately African-American, a group at higher risk than other ethnicities of developing glaucoma-related blindness.

This large study demonstrates that most of the differences in outcomes for PT, TS and GDD may be due to disease severity in the patients treated, rather than to differences in the techniques, devices, or surgeons involved in treatment, Dr. Sloan says. "As we move forward, we might expect to see a decrease in complication rates for these surgeries," he concludes.

Hope for patients with end-stage glaucoma---with continued treatment

Doctors can honestly give their end-stage glaucoma patients hope, says a study led by Jason W. Much, M.D. The findings break new ground in an under-researched area and will help Eye M.D.s evaluate, counsel and care for patients with visual field loss due to end-stage glaucoma. "Relentless progression to (complete) blindness is not the norm in treated patients," says Dr. Much. "Patients should be encouraged that treatment is not futile. They may retain their visual acuity for many years and be able to perform simple tasks of daily living and enjoy reading and hobbies."

The researchers reviewed charts of 64 patients (84 eyes) with end-stage glaucoma cared for by Eye M.D.s at the University of Pennsylvania

Medical Center from 1992 to 2004. All subjects were U.S. residents; most were black and had POAG. At the study baseline, the majority of patients had 20/50 visual acuity or better along with loss of most of their visual field, defined as being able to see less than a 10 degree radius from the center of the eye's focus. Because of the decreased field of vision, these patients were all considered legally blind at the onset of the study.

Fifty-six percent of eyes had had trabeculectomy and 71 percent had had laser trabeculoplasty (removal of part of the trabecular meshwork via laser). The average IOP, controlled by treatment, was 15.36 mmHg throughout the study period. At the study conclusion point, only eight in 84 eyes had 20/200 visual acuity---meaning the ability to see objects clearly and in detail was severely compromised--and in some of these eyes the loss may have resulted from progressive cataract. Few eyes suffered complete blackout of their central visual field because of glaucoma. These findings on maintenance of visual acuity were particularly encouraging in a study population that was predominantly African-American and therefore at higher risk for glaucoma progression.

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