diopathic intracranial hypertension (IIH) is a clinical condition of increased intracranial pressure (ICP) that causes severe headaches, tinnitus, blurred vision, and transient visual obstructions. If left untreated, chronic increased ICP can compress the optic nerve head, permanently damaging it, resulting in blindness. In IIH disturbed cerebrospinal fluid (CSF) dynamics may result from an increased resistance to CSF outflow at the arachnoid granulations (AGs) (figure A, yellow arrow indicates direction of CSF flow). Deborah Grzybowski, Ph.D. and Steven Katz, M.D., with graduate students David Holman and Shelley Glimcher, have modeled the outflow of CSF through human AGs using cell culture (in-vitro) and whole tissue (ex-vivo) perfusion models.

This work will provide knowledge of the mechanism of fluid and protein transport through the human arachnoid membrane, create novel ways to increase CSF outflow, modulate clearance of undesired proteins, and provide early disease intervention. In addition to implications for IIH, outflow through the arachnoid membrane has been implicated in a number of other disorders including hydrocephalus, and Alzheimer’s disease. In these models, human AG tissue is collected and the AG cells are isolated and grown on filter inserts or the tissue is fit under an o-ring and placed into an Ussing chamber (figure B). Cells and/or tissue are perfused at physiologic pressure with fluorescent microparticles and fixed under experimental pressure. Fixed tissue is processed for transmission electron microscopy (TEM) or cryo-sectioned and stained for visualization.

In-vitro and ex-vivo permeability results showed flow through the AG cells was uni-directional in the physiologic direction from the basal to apical (B→A) cell membrane. Microparticles were identified coursing up through the neck of arachnoid granulations, into and out of the arachnoid cap cell layer (figure C, red arrows mark microparticles). In figure D a microparticle is shown being released from the apical membrane. TEM showed extra-cellular cisternal spaces between overlapping AG cells suggesting a pathway for para-cellular fluid transport. Several large intracellular vacuoles (which did not stain with ruthenium red, yellow arrow heads) within the cytoplasm are shown suggesting a trans-cellular pathway for fluid flow (figure E). Red arrow heads indicate cellular boundaries stained with ruthenium red.

Ohio State has the only lab in the world undertaking this huge research endeavor and is beginning to gain recognition for their efforts. Both Drs. Grzybowski and Katz have been named to the Scientific Advisory Committee of the Intracranial Hypertension Research Foundation. In addition, Dr. Grzybowski has been named to the Steering Committee for the Brain Child Foundation for hydrocephalus research.
Thank You

Havener Society Donors

**OSU IntraLase FS**

*Blade-Free LASIK*

Refractive eye surgeons at The Ohio State University Medical Center have recently begun using a newer method of LASIK that relies solely on a laser. The surgeon uses IntraLase FS laser to create the corneal flap making it a bladeless procedure.

This technology enables the surgeon the ability to customize the corneal flap for every individual patient. In recent studies done by IntraLase, this technology may now make it possible to treat those who were previously dismissed as non-candidates due to thin corneas. This new laser may actually expand the population base of eligible patients because those who may have been reluctant to undergo LASIK for fear of a blade, may now have renewed interest with the availability of a 100% blade-free LASIK experience from start to finish.

With the bladeless LASIK and precise flap creation delivered by using IntraLase, surgeons may be able to treat patients with higher refractive errors, thinner corneas, large pupils, and moderate-to-high astigmatism. Studies have also shown the incidence of dry eye symptoms may be reduced with this new bladeless procedure.

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Establishing a tradition in Ophthalmology

**Havener Society Inaugural Dinner**

The 1st Annual Havener Society reception and dinner was held at the Hilton Easton in the Grand Ballroom on March 2, 2007. Havener Society members were honored with a gift following dinner for their generosity and support. A huge “Thank You” to those inaugural members for their devotion to the Havener Eye Institute over the years.
Thank You
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Equipment Donations
Advance Research and Teaching

Legacy 20,000 Phacoemulsification System has been donated to the Havener Eye Institute by Alcon Laboratories to provide expanded training options in cataract surgical procedures for ophthalmology residents.

The equipment, valued at $70,000, is located in the Department of Ophthalmology Medical Center clinic at West 10th Avenue. Ophthalmology residents use the Legacy System to perform cataract surgery in a wet lab using synthetic eyes. The equipment is similar to the phacoemulsification systems used in standard surgical suites, according to Tom Clancy, senior account manager for Alcon.

“We are very fortunate to have this technology added to our resident training program and it will provide significant opportunities for the residents to perfect their surgical skills,” said Dr. Thomas Mauger, chair of the Department of Ophthalmology and Baldwin Chair. “The residents have access to the equipment at all times and are able to gain additional practice when it is convenient for them,” he added. “We appreciate the support of Alcon to expand the training opportunities in our teaching laboratory.”

The Bausch & Lomb Company has donated a Zywave I Wavefront Aberrometer and an Orbscan II Anterior Segment Analyzer to the Havener Eye Institute. The technology, valued at $40,000, is being utilized in active research protocols and for clinical practice. “Our physicians are using the Orbscan extensively in refractive surgery and in evaluating corneal pathologies,” said Cynthia Roberts, associate professor of Biomedical Engineering, Ophthalmology, and Surgery and Torrence Makley Research Professor. The equipment is also being used in long-term, follow-up studies for the Bausch & Lomb Laser study conducted at Ohio State, she added.

Other research protocols utilizing the equipment include a study directed by Assistant Professor Deb Gryzbowski titled: Analysis of Corneal Biomechanics Based upon Central and Peripheral Corneal Thickness in Normal and Post-refractive Surgery Eyes. Several ophthalmology residents are also involved in research using the Bausch & Lomb gift, Roberts said. “This gift is vital to our continued efforts to expand compelling research at the Havener Eye Institute,” said Dr. Thomas Mauger, department chair. Both faculty and residents will benefit from the addition of the technology to the department, he added.
The 50th Annual Postgraduate Symposium was held at the Hilton Columbus at Easton. This year’s topic was Comprehensive Clinical Conundrums. Issues addressed included current diagnosis and treatment of strabismus, the differential diagnosis of Grave’s ophthalmopathy, and the role of steroids in the treatment of bacterial keratitis. Speakers included Gary Abrams, M.D., James Garrity, M.D., David L. Guyton, M.D., Jay Katz, M.D., Grace Levy-Clarke, M.D., Francis S. Mah, M.D., Quan Dong Nguyen, M.D., Francis Price, M.D., Jonathan Trobe, M.D., and Robert L. Hamlin, D.V.M., Ph.D. This year’s course director was Thomas Mauger, M.D.

Comprehensive Clinical Conundrums is a Huge Success!
March 2-3, 2007

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The Havener Eye Institute had many donors contribute less than $500. Thank you for your generosity and support.
A 53 year-old white female with no prior ocular history presented to her local optometrist’s office with complaints that her left eye appeared different in the mirror. The patient said she had noted the changes in her left eye within the last week and had not noticed any changes in her vision or had any pain. The optometrist noted changes in the iris architecture of her left eye and sent her in referral to our office.

At presentation, this patient had 20/20 vision in both eyes with eye pressures of 16 in the right eye and 36 in the left eye. Upon evaluation at the slit lamp, cornea appeared within normal limits with a quiet anterior chamber bilaterally. In the left eye, a large hole was noted in the temporal iris with pupillary displacement nasally. Gonioscopy revealed prominent PAS (peripheral anterior synechiae) for 6 hours nasally with scleral spur being visible for the remainder. The nerve exam revealed cup to disc asymmetry (0.3 in the right eye and 0.6 in the left eye). Visual fields were performed as baseline with full field in the right eye and an early superior arcuate defect in the left eye.

Lengthy discussion with the patient revealed that she had not undergone an eye exam in several years and had no family history of eye disease. Although a later presentation than typical, her diagnosis of ICE (iridocorneal endothelial) syndrome was discussed with treatment options. The recommended initial treatment included aqueous suppressants and the patient was followed closely for the next two months with successful pressure lowering results thus far.

Common to females in early to middle adulthood, ICE syndrome may present with unilateral decrease in vision, pain, or iris changes. Three specific syndromes are described in literature to better define the clinical spectrum of this disease. Chandler syndrome accounts for 55-60% of this spectrum and is hallmarked by corneal disease. The fine hammered-silver appearance can lead to corneal edema even at normal intraocular pressures. Specular microscopy reveals pleomorphic endothelial cells with darkened central areas (called ‘ICE cells’). Penetrating keratoplasty may be required with up to a 50% recurrence in the graft tissue. Corectopia, ectropion uveae, and iris hole formation are found in the progressive iris atrophy syndrome. Iris hole formation may be secondary to stretching (thins in opposite direction as corectopia) or melting from iris ischemia. Cogan-Reese syndrome, also known as iris nevus syndrome, reveals pigmented, pedunculated iris nodules protruding through the abnormal corneal endothelium that covers the iris surface.

Glaucoma is found in 50% of these syndromes due to the abnormal endothelial membrane covering the trabecular meshwork slowing aqueous outflow which can contract resulting in angle closure. PAS can also be extensive and can extend beyond Schwalbe’s line. These patients respond well to aqueous suppressants in general. Trabeculectomy may be required for optimal pressure control with excellent results.

Research Day June 15, 2007

The 27th Annual Ophthalmology Research Symposium will be held on June 15th, 2007. Residents and graduate students will present their research in the Magnuson Conference Room from 12:30-5:00pm. CME will be given for attendance.

Resident graduation, dinner and awards will follow from 6:00-10:00 pm at the Blackwell located at 2110 Tuttle Park Place. For more information visit or website www.eye.osu.edu or call Trish Rebish at 614-293-8117.
Come to our 2nd Annual Havener Eye Institute BuckEYE Golf Classic featuring Thad Matta, head coach of The Ohio State University men’s basketball team. The event will be held at the Golf Club of Dublin, voted by Golf Magazine as one of the top 25 courses in the United States. The scramble format outing will begin at 10 am with registration and an open range, followed by a Photo Opportunity with Thad Matta at 11 am and a Shotgun start at 1 pm. Prizes include 4 basketballs signed by The Ohio State men’s basketball team, several pairs of 2007 football tickets and a Cadillac for the golfer who can sink a hole in one. Proceeds from the event will go to funding The Department of Ophthalmology’s various research interests and resident education. Tickets to play will be $250 per player or $1,000 for a foursome. Registration forms are available on our website www.eye.osu.edu under News and Events below BuckEYE Golf Classic. Spaces are limited and are going fast. For information about outing sponsorship opportunities or registration, please contact Laura Sladoje at (614) 293-9161 or eye@osu.edu.

New Orleans AAO Alumni Reception

November 10, 2007
5:30PM-7:30PM
Royal Sonesta Hotel
300 Bourbon Street