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Addressing Challenging Uveitis Cases Through Collaboration and Tailored Therapies

At Mayo Clinic, Ophthalmology and Rheumatology work in close partnership to address some of the most complex and challenging cases in eye care, particularly those involving uveitis (Figure). Recognizing that uveitis often reflects underlying systemic autoimmune or inflammatory disease, Mayo Clinic emphasizes a truly multidisciplinary approach that brings together ophthalmologists, rheumatologists, immunologists and other specialists to provide seamless, patient-centered care.

Wendy M. Smith, M.D., an ophthalmologist with expertise in uveitis at Mayo Clinic in Rochester, Minnesota, leads collaborative efforts to diagnose and manage patients with conditions such as sarcoidosis, Behcet disease and Vogt-Koyanagi-Harada disease. Alexander R. Shusko Jr., M.D., an ophthalmologist with expertise in uveitis at Mayo Clinic in Arizona, similarly partners with rheumatology colleagues to treat complex cases of spondyloarthropathy-associated uveitis and lupus-related ocular inflammation, ensuring that patients benefit from the collective expertise of a world-class team.

This integrated model allows Mayo Clinic to offer rapid, comprehensive assessments and initiate tailored therapies that address both ocular and systemic aspects of disease. For instance, patients with vision-threatening birdshot chorioretinopathy are evaluated jointly by Ophthalmology and Rheumatology to coordinate immunomodulatory therapy, while cases of juvenile idiopathic arthritis-associated uveitis benefit from early, aggressive co-management to preserve long-term vision.

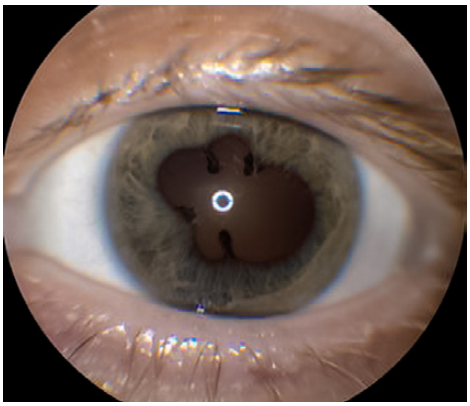

Figure. Inflammation in the eye, as seen in uveitis, can cause adhesions of the iris to the lens, called posterior synechiae, resulting in an irregular shaped pupil.

"Consultation with rheumatology specialists involves a detailed history and full physical exam to help determine if there are signs of a systemic inflammatory process," says Lilly H. Wagner, M.D., an oculoplastic surgeon at Mayo Clinic Rochester, who co-manages

inflammatory orbital disease with consultants from rheumatology. "I value my rheumatology colleagues' input regarding medical safety, systemic issues and their experiences with other medications that we as ophthalmologists might not frequently prescribe. We keep in contact about the status of the eye inflammation and discuss whether medication needs to be increased or changed."

Mayo Clinic researchers continue to seek improved treatments. Mayo Clinic is currently a study site for an industry-sponsored, international clinical trial investigating the efficacy of a JAK inhibitor for the treatment of noninfectious uveitis.

"It is crucial to solidify an accurate diagnosis before starting uveitis treatment and establishing a follow-up plan," says Sophie J. Bakri, M.D., a vitreoretinal specialist and chair of Ophthalmology at Mayo Clinic in Rochester, Minnesota. "By uniting subspecialty expertise under one institution and fostering a culture of collaboration, Mayo Clinic delivers innovative solutions and improves outcomes for patients with the most complex inflammatory eye diseases."

Novel Surgical Technique for Correcting Excyclotropia

A new surgical approach for correcting excyclotropia has shown promising results, according to a retrospective case series conducted by Mayo Clinic researchers. The study evaluated the effectiveness of a procedure known as superior oblique anterior fiber plication (SOAFP) (Figure), with or without an anterior knot, allowing for postoperative adjustment.

Several surgical procedures have been described to correct excyclotropia by repositioning the superior oblique tendon fibers, which insert posteriorly on the globe. These procedures include modifications to the original Harada-Ito technique with advancement or resection of the anterior fibers of the superior oblique muscle and use of adjustable sutures. Approaches using adjustable sutures on the superior oblique can be technically challenging.

"Double vision disrupts the quality of life for patients," says Erick D. Bothun, M.D., an ophthalmologist at Mayo Clinic in Rochester, Minnesota, and lead author of this study. "Commonly strabismus surgeons tackle the horizontal or vertical deviations and shy away from fixing torsion. This conservative approach can lead to residual symptoms. This study conveys our experience with a novel surgical approach for correction of extorsion that entails tightening just the anterior fibers of the superior oblique with a uniquely positioned, anterior knot that allows for the addition of an accessible adjustable short-tag sliding knot suture."

Erick D. Bothun, M.D.

The study included 14 patients, ranging in age from 21 to 92 years, who underwent SOAFP in 18 eyes. In 12 eyes, SOAFP was the sole procedure, while six eyes underwent additional horizontal rectus muscle modifications, including recession, resection and plication. Ocular alignment was assessed using prism and alternate cover tests, as well as double Maddox rod evaluations, at multiple time points: preoperatively, at the initial postoperative visit and at the final follow-up (approximately 6 to 8 weeks postsurgery).

Preoperative extorsion varied between 2 and 30 degrees, with a mean of 10.14 ± 7.01 degrees. A unilateral or bilateral plication ranging from 2 mm to 30 mm (mean, 8.93 mm ± 5.63) was performed. Initial postoperative assessments indicated a mean intorsional shift of 11.18 ± 7.37 degrees, with a correction effect of approximately 1.86 degrees per millimeter of plication. Further adjustments were made in three eyes to achieve a stronger plication effect targeting 5 degrees of intorsion.

By the final follow-up, conducted 61 ± 23 days after surgery, mean extorsion was significantly reduced to 1.21 ± 2.29 degrees, ranging from 5 degrees of extorsion to 3 degrees of intorsion. The final mean intorsional shift was 9.14 ± 7.53 degrees, equating to an average correction of 1.16 ± 0.50 degrees per millimeter of plication. Encouragingly, 13 out of the 14 patients demonstrated notable improvement in diplopia.

This study, published in the *Journal of AAPOS* in 2024, highlights SOAFP as an effective and adjustable surgical option for treating excyclotropia. "Managing ocular torsion is challenging for strabismologists," says Dr. Bothun. "This approach makes surgical correction more approachable and leads to better outcomes. I have heard from colleagues that because of this technique, they have gone back to doing surgery for this ocular motility disorder."

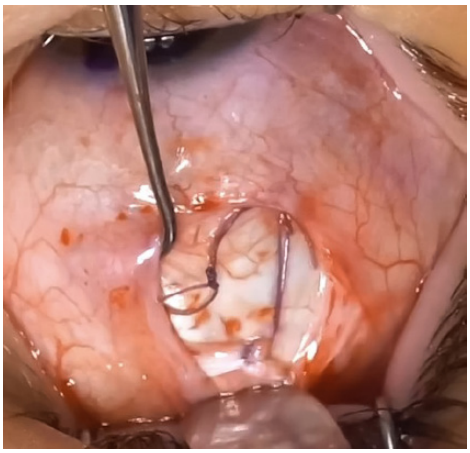

Figure. Intraoperative photograph of a SOAFP with dogleg suturing and an anterior adjustable sliding knot.

"The procedure allows for precise targeting and correction of ocular misalignment, contributing to significant improvements in visual function for most patients," says Dr. Bothun. "Since publishing and discussing the study results, this procedure is now being performed globally. I have received messages from colleagues across the U.S., Europe and Asia expressing appreciation. Further research and clinical application may help to continue to refine the approach and assess its long-term outcomes."

FOR MORE INFORMATION

Anderson M, et al. Novel superior oblique anterior fiber plication with or without adjustable sliding knot for extorsion. *Journal of AAPOS*. 2024;28:103927.

Resident Olympics Provide Educational Opportunities, Camaraderie and Collaboration

The 8th annual Mayo Clinic Ophthalmology Resident Olympics is a dynamic and engaging event designed to unite trainees in a spirited display of skill, teamwork and resilience. The skills-based, hands-on session teaches basic procedures for emergent ophthalmic conditions, which fosters an atmosphere of friendly competition and professional growth.

Each year, Mayo Clinic Ophthalmology faculty and Mayo Clinic fellows volunteer their time and expertise at this event to teach valuable skills in a hands-on manner. Skills and procedures at the Resident Olympics include anterior chamber paracentesis, intravitreal tap and inject, retrobulbar block, temporary tarsorrhaphy, eyelid margin laceration repair, and lateral canthotomy and cantholysis. The event is timed to aid in the transition of the new postgraduate year 2 (PGY-2) residents to primary call.

"The six procedures included in the Ophthalmology Resident Olympics are specifically chosen because of their often urgent or emergent nature," says Kerri M. McInnis-Smith, M.D., an ophthalmology resident at Mayo Clinic in Rochester, Minnesota. "The simulation day provides an environment in which residents have the opportunity to ask questions and practice these skills on cadaver models with the oversight of subspecialty fellows and faculty."

The event consists of a morning didactic session, followed by hands-on training in the wet lab with cadaver heads and eyes. Following those activities, the team-based competition takes place. The PGY-2 and PGY-3 residents split up into teams and compete in the skills, as well as suturing (Figure). To earn extra points, the residents participate in "Jeopardy"-style quiz questions.

"We initially designed our Resident Olympics after seeing other programs offering suturing recitals, but we also wanted something to teach more procedural-based skills," says Matt R. Starr, M.D., a vitreoretinal surgeon and program director for the ophthalmology residency at Mayo Clinic. "Other programs throughout Mayo Clinic have similar competitions including X Games or competitions on surgical simulators. Building on those examples, we've been successful in creating an event tailored to the needs of our ophthalmology residents — even publishing our methods and results of the training."

"The Ophthalmology Resident Olympics is a great way to learn stressful procedures in a low-stress environment," says Jessica A. Kraker, M.D., M.S., a recent ophthalmology graduate of Mayo Clinic. "We learn and practice several emergent procedures. We then compete with each other to see who can perform them best in a limited time window — under the watchful supervision of our faculty members who are experts in the field."

"It is something I look forward to every year. You get to see how much you have progressed in your skills and knowledge with each year of residency completed," continues Dr. Kraker. "As a chief resident, I am able to supervise earlier trainees and watch their skills grow."

Not only does the Resident Olympics inject a dose of excitement into the demanding world of residency, but it also reinforces essential competencies in a setting that emphasizes teamwork. Participants refine procedural skills, test their clinical knowledge under pressure and forge lasting bonds with colleagues. In addition to the overall team winner, there are individual awards presented to residents with outstanding performances.

"When starting out, even a task so simple as setting up and gathering the appropriate instruments for each procedure can be daunting," says Dr. McInnis-Smith. "By the end of the academic year, I have performed each one of the six procedures multiple times while on primary call."

"One of the procedures I practiced during the Resident Olympics was a canthotomy and cantholysis for retrobulbar hemorrhage, which can be an extremely painful, vision-threatening condition requiring an emergency procedure," says Dr. Kraker. "As a first-year resident, I had to do a bilateral canthotomy and cantholysis at 2 a.m. This happened the day after the Ophthalmology Olympics, so my skills were fresh and I was able to complete the procedure confidently."

Figure. Residents participating in the Resident Olympics

Kerri M. McInnis-Smith, M.D.

Matt R. Starr, M.D.

Jessica A. Kraker, M.D., M.S.

Spotlight on Residents

Mayo Clinic Ophthalmology welcomes the latest PGY-1 resident class of 2029 and congratulates current graduating residents on their next endeavors.

Bhoomi H. Dave, M.D.

Hometown: Columbus, New Jersey

Medical School: Drexel University College of Medicine

Bridger P. Jeppesen, M.D.

Hometown: Tooele, Utah

Medical School: Case Western Reserve University School of Medicine

Shreya Swaminathan, M.D.

Hometown: San Ramon, California

Medical School: Sidney Kimmel Medical College at Thomas Jefferson University

Kenny Y. Wang, M.D.

Hometown: Whippany, New Jersey

Medical School: Mayo Clinic Alix School of Medicine — Minnesota Campus

Figure. Tim T. Xu, M.D., Jessica A. Kraker, M.D., M.S., Piotr K. Kopinski, M.D., Ph.D., and Haley D'Souza, M.D., M.S., are pictured from left to right.

Haley S. D'Souza, M.D., M.S.,

is joining Cleveland Clinic for a medical retina fellowship.

Piotr K. Kopinski, M.D., Ph.D.,

is joining Moorfields Eye Hospital for an ocular oncology fellowship.

Jessica A. Kraker, M.D., M.S.,

is joining the University of Colorado for a uveitis fellowship.

Tim T. Xu, M.D.,

is joining Wills Eye Hospital for a vitreoretinal surgery fellowship.

CONTACT US

Mayo Clinic welcomes inquiries and referrals, and a request to a specific physician is not required to refer a patient.

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or email ***cme@mayo.edu***

Ophthalmology Update

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Medical Editors
Sophie J. Bakri, M.D.
Lilly H. Wagner, M.D.

Cover Image
Human multicolored iris of the eye animation concept. Credit: CG Alex

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