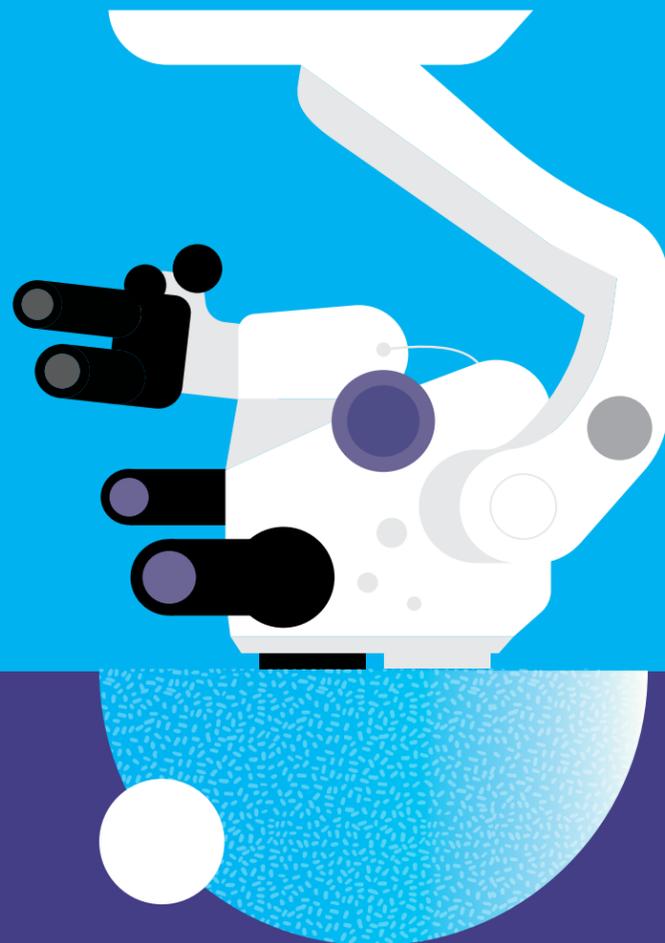


# NYEE

# Residents

## Sharpen Their Skills on Four Complex Cases



As New York Eye and Ear Infirmary of Mount Sinai (NYEE) continues to strengthen and expand its ophthalmology residency program—the largest accredited program of its type in the country—trainees are exposed to learning opportunities available at few other academic medical centers.

In 2021, for the first time, residents were able to rotate among four clinic and acute care sites throughout New York City that offer an extraordinary range of patients and ocular pathologies. Moreover, residents get to observe and actually perform parts of surgeries during their first year so that by their second year they are handling procedures from start to finish (under the watchful eye of an attending physician). “Accelerating the surgical process by a full year enables residents to function at a higher level during their first year, and represents a fundamental change in how we deliver residency training,” says Harsha S. Reddy, MD, Ophthalmology Residency Program Director and Site Director for Oculoplastics, Orbital, and Reconstructive Surgery at NYEE and Mount Sinai Beth Israel.

Paving the way for that restructuring is the Joint Internship Program launched in July 2020. The initiative allows trainees to start their residency enrolled in a one-year internship at Mount Sinai Beth Israel, which includes nine months of general medicine and three months of ophthalmology training. “Our Joint Internship Program gives us a small but important block of additional time to expose residents to our subspecialty clinics and to train them to perform the patient eye exam and treat emergencies,” notes Paul A. Sidoti, MD, Deputy Chair for Education, Department of Ophthalmology, Icahn School of Medicine at Mount Sinai, and Chair of Ophthalmology, NYEE. “It allows interns to truly hit the ground running when they begin their three-year residency.”

The four cases described on the following pages exemplify the complex procedures and pathologies that residents tackle. “What makes our program unique is that it allows residents to sharpen their surgical skills on cases that would be reserved for fellows or attendings elsewhere,” explains Dr. Reddy. “At NYEE, they’re not just observers, but actual surgeons who get to experience the complexities and teamwork that only a multispecialty eye hospital like New York Eye and Ear can offer.”

▶ cases begin on next page

# A Resident Draws on a Diverse Team To Address a Traumatic Eye Injury

Treating eye injuries day after day at New York Eye and Ear Infirmary of Mount Sinai's (NYEE) busy walk-in eye clinic in Manhattan has reinforced for Shravan Savant, MD, the role of triage in ensuring patients the best outcomes. Just how important a role was driven home again to the third-year ophthalmology resident by a 56-year-old man who entered the clinic one morning in March of 2021 after a 10 mm shard of metal from a machine shop penetrated his left eye, leaving him with intense pain and a traumatic wound in need of emergent care.

"With a complex case like this, the most immediate concerns are stabilizing the eye and triaging the patient in the most accurate and efficient way," says Dr. Savant. "My initial examination showed that the metal had pierced the patient's cornea and reached back to the lens, so I immediately made plans to send him to Mount Sinai Beth Israel for a CT scan to check for other metal fragments in the posterior segment. At the same time, I developed a plan for surgery as soon as he returned."

Given the nature of the wound, the No. 1 concern for Dr. Savant was infection, which could dramatically affect the outcome. "Apart from infection risk, a piece of metal in the retina is toxic, and can destroy vision very quickly," he explains.

Of more immediate concern for the patient, Jan Gilewski, a machine welder for New York City Transit, was the mounting pain. "I waited a bit, thinking it might go away, but when my vision became cloudy and the pain didn't let up, I told my supervisor and we drove across the bridge to the clinic at New York Eye and Ear," he recalls.

He was met by Dr. Savant, who soon began administering abundant amounts of antibiotic eyedrops, intravenous antibiotics, and tetanus vaccine to control the threat of infection. Meanwhile, the results of the CT, which arrived within an hour, showed the back of the patient's eye to be free of any metal. With that welcome news, Dr. Savant and the voluntary attending, Luna T. Xu, MD, Assistant Clinical Professor of Ophthalmology, NYEE, began surgery late that afternoon. "The prognosis is always guarded when you have a large foreign body removal like this one," explains Dr. Savant. "Even after the object is removed and the wound

is closed, the patient faces the prospect of astigmatism, and vision out of the eye may never be as good as it originally was."

When first attempts to push the object out by enlarging the wound opening proved unproductive, the surgeons used retinal forceps to snake the metal out from the front. That tactic allowed them to better assess the damage, and they learned that the force of the shard entering his eye had shattered its natural lens, triggering a traumatic cataract that precluded traditional lens removal. The capsule of the lens had split into the dreaded "Argentinian flag" configuration, preventing the normal techniques for capsulotomy. Instead, the surgeons used a technique known as a can opener capsulotomy in which they etch a circular series of tiny nicks in the anterior capsule surrounding the lens using a cutting instrument known as a cystotome, creating an opening to remove the cataract.

With the cataract removed, the next challenge confronting Dr. Savant and Dr. Xu was selection and placement of a new intraocular lens. Once again this called for extraordinary measures since the foreign body protruding into the eye had damaged the capsular bag, the normal support structure for the lens. Instead, the team implanted a three-piece acrylic lens in the sulcus in front of the bag. That still left another critical step: repairing the gaping hole in the cornea where the metal had entered by suturing it closed.

The patient's vision out of the injured eye improved to 20/50 within the first few days, and to nearly 20/20 within 10 days, with no signs of infection. "He's actually seeing better out of his left eye than the other, which we never expected," reports Dr. Savant. "It shows what's possible when you get the entire team involved, from radiology to our retina specialists to our on-call trauma attendings. We did everything by the book, and it resulted in an excellent outcome."

The patient would be the first to agree. "I knew NYEE was the best eye clinic in the city, and Dr. Savant confirmed that for me," says Mr. Gilewski. "He dropped everything he was doing to focus on my case from the moment I walked in. He told me he would do everything he could to save my eye, and he certainly kept his word."



**"We're surrounded by great attendings who are always available to guide us through our training. They enable us to continually aim for the gold standard of the best clinical care for our patients."**

—Shravan Savant, MD





**“Communication between team members is particularly important in cases where residents are seeing a patient almost every day.”**

—Jorge Andrade Romo, MD



Jorge Andrade Romo, MD



Jeanette Du, MD



# A Rare Pathogen Turns Residents Into a Team Of Medical Sleuths

Bacterial infections are common fare for residents who staff New York Eye and Ear Infirmary of Mount Sinai’s (NYEE) comprehensive clinic. But when a young patient walked through the door in November 2020 with an infection so rare there were only two cited cases in the medical literature, it presented a unique opportunity for these ophthalmologists-in-training to learn about a new opportunistic pathogen and how to treat it.

The patient was an 11-year-old sixth grader, Chloe Corvino. She was referred to NYEE by Gaurav Chandra, MD, an ophthalmologist in her Westchester County hometown, after he noticed a serious infectious ulcer on the cornea of the right eye. “She was in intense pain and needed a clinic that could handle this type of pathogen with appropriate culturing and administration of fortified antibiotics,” says Dr. Chandra. NYEE, where he had completed his own fellowship in uveitis and ocular immunology, was the obvious choice.

The young patient was examined on a Saturday morning by Jeanette Du, MD, a first-year resident at the time. “This was an unusual case for me because it involved a child,” she notes. “But being a resident at a huge referral center like New York Eye and Ear, I had already seen a fair share of infections, and was comfortable doing the culturing to determine its etiology and starting the patient on antibiotics.”

Just as importantly, Dr. Du began communicating with the rest of the diverse team that would coalesce around the patient in the weeks of treatment to follow. These members included fellow residents Jorge Andrade Romo, MD, and Shravan Savant, MD, and specialists from NYEE’s Pathology, Pharmacy, and Corneal Services.

The turning point in the case was the return days later of the cultures from the microbiology lab. They showed that the soupy-looking 4 x 4.2 mm ulcer on the central cornea was not some typical bacterial infection, but an extremely rare fungal infection known as *Rhodotorula mucilaginosa*. Dr. Romo’s research found it to be a yeast organism of eastern Indian origin of which only 43 cases worldwide were reported between 1960 and 2000. It had somehow found its way to the suburbs of New York and into the eye of Chloe, a contact lens wearer, possibly through hot tub exposure.



Shravan Savant, MD



That revelation dramatically altered the treatment. Acting on very limited available research, the team, which included Anita Gupta, MD, Director of the Cornea Service at NYEE, decided on a systemic antifungal treatment of amphotericin B (0.15%) around the clock, eventually adding the topical medication vericonazole (1.0%). “We told the parents that we needed to switch to more robust medications, which we thought could deliver better results, but that these antifungal medicines also carried greater systemic risk,” says Dr. Savant, now a third-year resident who headed up the treatment team. “We also informed them that the visual prognosis in cases with this level of infection is guarded. We couldn’t be sure how much vision the patient would get back, and that the worst outcome could have been complete loss of vision.”

Within a week, the results began to crystallize. Chloe went from light perception only in the affected eye before the antifungal medicines to 20/70. “From the moment she was able to read letters on the wall chart, as they got smaller and smaller, we knew we were seeing incredible results,” beams Dr. Savant, who will soon begin a retina fellowship at Beth Israel Lahey Hospital and Medical Center in Massachusetts. The patient is not out of the woods yet: residual scarring on the surface of the eye could eventually require a corneal transplant. But for now, Chloe’s right eye vision is 20/25, enabling her to pursue a normal routine of classes and after-school lacrosse and field hockey.

“The doctors at New York Eye and Ear Infirmary were truly Chloe’s guardian angels,” says Chloe’s mother, JoAnne Corvino. “They were kind and patient and thoroughly explained everything to our frightened 11-year-old daughter. They were fully committed to helping her and I don’t believe we would have gotten the results we did if we had gone anywhere else.”

# A 31-Year-Old Man With Advanced Cataracts Puts a Third-Year Resident to the Test

When third-year ophthalmology resident Tommaso Vagaggini, MD, examined a 31-year-old man—the same age as Dr. Vagaggini—with advanced cataracts in both eyes, his training at New York Eye and Ear Infirmary of Mount Sinai (NYEE) instantly kicked in.

“We see a lot of cataracts at our eye walk-in clinic, but rarely ones this dense or hydrated, especially in someone this young,” recalls Dr. Vagaggini. “It made me think diabetes could be the underlying cause.”

A simple finger-stick blood sugar test done on the spot confirmed his suspicion: the patient’s glucose level was through the roof at 465 mg. He was immediately sent to the emergency room at nearby Mount Sinai Beth Israel (MSBI) in downtown Manhattan, where he remained for three days as an endocrinology team began an aggressive program to get his type 2 diabetes under control—a critical step before addressing his cataracts.

“I was really scared when I got the diagnosis,” says the patient, Luis Riollano. “It never crossed my mind that I might have diabetes, or cataracts at my age.”

What he did know was that something was seriously wrong with his sight. An eyeglass wearer, he said his vision had become so cloudy by late summer 2021 that he was reduced to seeing shadows and shapes only. He was forced to leave his job, and even a trip to the grocery store turned into a navigational challenge. Thinking a simple change in prescription might be the solution, he went to an optometrist in his Brooklyn neighborhood, who informed him he had cataracts and referred him to NYEE.

Under the care of endocrinologist John Graham, MD, PhD, and his team at MSBI, Mr. Riollano steadily improved with insulin injections and a rigorous diet. Dr. Vagaggini closely monitored his progress, and was assured in early December by Dr. Graham that the patient’s blood sugar was now under control, making it possible to proceed with ophthalmic surgery.

That intervention presented its own set of challenges—and another unique learning experience—for Dr. Vagaggini. Because

the patient’s cataracts were so large and dense, surgeons were unable to see what other pathology was present in the back of the eye. Just as concerning was the stress those cataracts were causing to the capsular bag—the thin membrane around the eye’s natural lens. “When a bag is under that much pressure, it stretches, and during cataract surgery, you run the risk of the membrane splitting open uncontrollably and causing a posterior capsule break, as well. That’s a very serious surgical complication.”

Fortunately for Dr. Vagaggini and the attending on the case, Robyn Horowitz, MD, a voluntary clinical instructor with NYEE, the lens capsule remained intact even after the initial anterior opening was made, allowing them to begin the delicate task of removing the cataract from the anterior chamber of the patient’s left eye through phacoemulsification. That prompted other critical decisions: what type of intraocular lens (IOL) to implant, and where to place it. “When you have a capsular bag that unstable, placing a lens inside could be a recipe for disaster,” explains Dr. Vagaggini. “So we decided to use a three-piece IOL and implant it in front of the bag, in the sulcus, the space between the posterior surface of the iris and the anterior surface of the capsular bag.”

Despite the challenges, the surgery on December 7, 2021, went well, as evidenced by the patient’s vision the next day. “I was able to see better out of my left eye than ever before,” Mr. Riollano beams. The second cataract surgery three months later—a more conventional procedure without the drama of the first—left the patient even more ecstatic. “I was really amazed—the doctors gave me 20/20 vision out of both eyes without glasses,” he says. “I had always been afraid of doctors, but this experience completely changed me. Dr. Vagaggini went above and beyond, even giving me his personal phone number.”

Dr. Vagaggini professes to be as excited about the outcome as the patient. “I was immensely satisfied to know that someone only 31 years old is now able to return to a normal life with no limitations. For me, that’s the most wonderful part about being a physician.”



**“As a resident at New York Eye and Ear, I’m given the independence to see and guide patients through their journey and establish close bonds with them as their physician. That’s an incredible part of my training because it gives me the confidence to take on increasing responsibility.”**

—Tommaso Vagaggini, MD



# A Delicate Orbitotomy Teaches Residents the Value of Persistence



**“My surgical training involves working with many different specialists on really difficult and complex cases. The fact we handle these high acuity cases so frequently is unique to New York Eye and Ear’s residency program.”**

—Bella Wolf, MD



Most ophthalmology residents in medical schools nationwide never see a cavernous hemangioma, a sight-threatening orbital tumor characterized by bulging and displacement of the eye. When third-year New York Eye and Ear Infirmery of Mount Sinai (NYEE) resident Bella Wolf, MD, became part of a team performing a three-hour orbitotomy on a 43-year-old female patient, it taught her a valuable lesson about the importance of discipline and perseverance during these extremely delicate surgical procedures.

“There were times during the surgery I thought we were never going to find the tumor, it was embedded so deeply in the retro orbital area behind the eye,” she recalls. But observing firsthand the determination and patience of the attending on the case, Harsha S. Reddy, MD, Site Director for Oculoplastics, Orbital, and Reconstructive Surgery at NYEE and Mount Sinai Beth Israel and Director of the Ophthalmology Residency Program, convinced her of the need to “never let up until you’ve reached the goal of giving your patient the best outcome possible.”

That goal is more challenging than ever in the case of cavernous hemangiomas, where surgeons must typically operate in extremely tight spaces near the optic nerve. What’s more, this type of benign tumor—consisting of tightly packed thin-walled capillaries—can hemorrhage during surgery, risking blood supply to the optic nerve and other critical structures of the eye and eye socket.

When the patient was referred to NYEE by an outside ophthalmologist in late October 2021 with severe proptosis (in excess of 8 mm) of the right eye, physicians immediately suspected that a mass behind the eye was responsible for the bulging. An MRI confirmed the diagnosis: a right orbit intraconal tumor (2.5 x 2.2 x 1.7 mm) was causing displacement of the optic nerve, suggesting a noncancerous orbital lesion. Another sign was the patient’s vision, which had decreased to 20/125 and would certainly get worse—with complete loss of sight a possibility—without removal of the tumor.

The minimally invasive orbitotomy began late on a Friday afternoon, with Dr. Wolf and second-year resident Mona Fayad, MD, joining Dr. Reddy for the procedure. Gaining access to the deeply entrenched mass, which was abutting the optic nerve and pushing it upward, was the most trying part of the lengthy procedure for the residents. The surgical team began with a tiny incision below the corner of the eye; they then loosened the bottom part of the eyelid from its attachment to the bone and dissected downward through the conjunctiva to reach the retro orbital area. “The tumor evaded us by burying itself among the surrounding tissue,” explains Dr. Fayad. “That’s where Dr. Reddy’s calm and motivating manner kept us moving forward, until we found a way to remove it in one piece.”

The next challenge for the surgeons was removing the tumor without rupturing its fragile walls and triggering a loss of blood that could have been catastrophic for the eye. Here the residents learned the advantages of multiple techniques—including blunt dissection, traction sutures, and cryotherapy—to slowly pull the tumor out in one piece. Dr. Wolf, who will soon begin a cornea fellowship at the University of Illinois, remembers the meticulous process as “an amazing feat that extracted the tumor without disrupting it, and left the patient with a barely visible scar beneath her eye.” The success of the procedure became more evident in the days that followed, when the patient’s vision in her right eye improved to 20/25, coupled with a favorable prognosis for normal vision out of both eyes.

“As residents, we see a lot of complex cases here, but this one took us to a different level,” stresses Dr. Fayad. “It showed us the importance of tactful preoperative planning, sheer determination, and expert supervision, which happen to be the fundamentals of our training at NYEE.”



Mona Fayad, MD