# ASOT News

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The American Society of Ophthalmic Trauma Newsletter

*Edited by Lucy Cobbs, MD, Rachel Israilevich, BS, and Allison Rizzuti, MD*

## Upcoming Events

Saturday, June 4th, 2022 10am-3pm EST:
ASOT Annual Meeting (virtual).
Meeting registration will open in May

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## Trauma Article Top Pick

Global Current Practice Patterns for the Management of Open Globe Injuries:

This cross-sectional survey study assessed global management paradigms for open globe injuries (OGIs) across trauma centers worldwide. Responses from 36 (85.7%) institutions showed wide variations in preferred management practices, including the use of preoperative systemic antibiotics (75.8%) versus topical antibiotics (30.3%), intraoperative ophthalmic antibiotics (54.5%), postoperative systemic antibiotics (69.7%), and postoperative topical steroids (87.9%). Thirty-one (61.3%) centers involved resident trainees in repairs, and 18 (54.5%) centers routinely admitted patients for observation following repair. Evidence-based guidelines are needed to ensure the highest standard of care for all patients with OGIs.

https://www.ajo.com/article/S0002-9394(21)00407-4/fulltext

# ASOT Exclusive Article

## Relative Merits of Nylon and Polyglactin 910 for Superficial Wound Closure:

*Sitara H. Hirji, MD, Danielle Trief, MD, James D. Auran, MD. Edward S. Harkness Eye Institute, Columbia University Irving Medical Center, New York, NY, USA*

Superficial wound closure in ophthalmic trauma surgery is commonly accomplished using either nylon or polyglactin 910 (i.e. Vicryl) sutures. Nylon is a nonabsorbable, monofilament suture. Polyglactin 910 is an absorbable, synthetic braided polymer. Surgical goals for ophthalmic trauma cases include water-tight closure and restoration of anatomy with minimal scarring to preserve as much visual function as possible. To date, there is limited data published regarding which should be the preferred suture for such cases. This discussion aims to delineate the relative merits of nylon and polyglactin 910 for ophthalmic trauma necessitating closure with sutures.

Superficial wounds requiring closure in trauma cases may involve cornea, limbus, and/or sclera, which respectively require increasing tensile strengths. Nylon demonstrates consistently high tensile strength for surface wounds, with intraocular dissolution via slow hydrolysis over a period of years (1). In contrast, the absorbable polyglactin 910 suture loses 92% of its tensile strength by 28 days following implantation (2). Other than the material, the size of the suture also factors into tensile strength. The larger the suture, the higher the tensile strength, though the relationship is not linear. For example, the minimal tensile strength per U.S. Pharmacopeia standards for 9-0 nylon is about 126% stronger than 10-0 nylon, and the minimal tensile strength for 8-0 nylon is about 39% stronger than 9-0 (3). In general, the use of size 10-0 suture for the cornea, 9-0 for limbus and conjunctiva, and 8-0 for sclera is a useful guide when determining appropriate suture size (4).

While the non-absorbable nature of nylon suture positively impacts its long term tensile strength, this characteristic also serves as a limitation as it requires close post-operative follow up for suture removal. It may therefore be beneficial to use polyglactin 910 for superficial wounds if a patient has trouble making it to scheduled appointments. For ophthalmic trauma patients, who may need to go to the OR in an urgent setting, it may also be useful to use polyglactin 910 if there is a question, before operating, about reliable follow up. Additionally, polyglactin 910 has additional advantages in the pediatric population, as it prevents the need for a return trip to the operating room for children who are unable to tolerate suture removal at the slit lamp (5).

Degree of inflammation response is another suture characteristic that affects wound integrity. Nylon is often differentiated by causing minimal cellular reaction in the post-operative period as compared to polyglactin 910 (6). This benefit is attributed to the monofilament configuration and inert characteristics of Nylon, resulting in the increased ability of nylon to resist infection from experimental wound contamination (7). This may be of specific benefit in penetrating trauma cases in which the affected eye is often exposed to infectious agents during the traumatic event.

Tensile strength, absorbability, and degree of inflammation response are suture characteristics that should be considered by all operating ophthalmologists. For reliable adult patients, we recommend nylon as the preferred suture choice for ophthalmic trauma surgery, as its tensile strength and minimal inflammatory response promote water-tight wound closure. For patients who have undetermined or limited ability to follow up in the post-operative setting, we recommend superficial closure with polyglactin 910, as it eliminates the need for suture removal in most patients.

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# Member Spotlight

Marisa Gobuty Tieger serves as the Membership Chair for the ASOT. Marisa is currently a vitreoretinal surgery fellow at Harvard Ophthalmology/ Massachusetts Eye and Ear, where she also completed her residency training. After her residency, Marisa served as Chief Resident and the Director of the Ocular Trauma Service at MEE, where during that time, she repaired over 100 open globe injuries and performed cataract surgery on patients with traumatic or complex cataracts. It was this formative experience that inspired Marisa's interest in ophthalmic trauma and surgical teaching. Marisa holds her MD from Tufts University School of Medicine and her BS from Syracuse University. She is a former Division I basketball player, having attended Syracuse on an athletic scholarship, and is a former member of the Israeli National Team while growing up in Herzliya, Israel.

# Featured Case

## Intraocular Foreign Body in the Setting of Recent LASIK:

Lucy Cobbs, MD, Rakhi Melvani, MD, Charles Brodowski, MD, Young Sheng, BA, John Anhalt, MD. Wills Eye Hospital, Philadelphia, PA, USA

### Case Presentation

A 30-year-old male presented to the Wills Eye Emergency Room with right eye foreign body sensation after chopping wood with an axe. He denied any vision changes or gush of fluid. He was not wearing safety glasses while chopping wood. Looking in the mirror, he reported he could see a piece of metal or wood in his eye. His past ocular history was significant for undergoing LASIK in both eyes four weeks prior.

On initial exam, his visual acuity was 20/20 in both eyes without correction, his pupils were round and reactive with no relative afferent pupillary defect, and his intraocular pressures were 18mmHg OD and 17mmHg OS by Tonopen. Slit lamp examination of his right eye showed mild soft eyelid edema and erythema, 1+ conjunctival injection, a large LASIK flap in place with a temporal hinge and inferotemporal haze at the interface, a self-sealed 2-millimeter full-thickness superior paracentral corneal laceration inferior to the superior LASIK flap border which was seidel negative, a deep anterior chamber with 3+ pigmented cell, and a metallic foreign body embedded in the iris superonasally at 1o'clock (Figure 1). The metallic foreign body measured 1.8 horizontal by 1.1 vertical millimeters with a small apex embedded in iris and the remainder of the foreign body suspended in the anterior chamber. Dilation of the right eye was not performed to avoid dislodging the foreign body. Gentle B-scan ultrasound showed no intraocular foreign body in the vitreous cavity or retinal detachment/opacities. Examination of his left eye was unremarkable. He underwent CT orbits, which demonstrated a subcentimeter metallic foreign body along the superior aspect of the right lens with associated right preseptal soft tissue swelling.

### Surgical Management

Patient was given intravenous broad-spectrum antibiotics and intramuscular Tetanus and taken to the operating room for removal of the intraocular foreign body (IOFB). In the operating room, a paracentesis was made in clear cornea. The anterior chamber was filled with viscoelastic. A clear corneal incision was made temporally using the keratome.

Continued on next page.

Additional viscoelastic was used to dissect the IOFB off the iris surface to allow it to be safely grasped with MST forceps and removed through the temporal incision. A 10-0 nylon suture was placed partial thickness through the self-sealed corneal laceration. An irrigation and aspiration handpiece was used to remove the remaining viscoelastic and further irrigate the anterior chamber. A second suture was placed with 10-0 nylon at the temporal wound. The self-sealed corneal laceration was found to be seidel negative intraoperatively. Intracameral moxifloxacin was injected into the anterior chamber. At the end of the case, intravitreal vancomycin, ceftazidime, and voriconazole were injected into the vitreous cavity, given the high risk of endophthalmitis with possible intraocular vegetative material.

On postoperative day one, his right eye visual acuity was 20/30 pinholing to 20/20-2 without correction, his intraocular pressure was 14mmHg. He had scattered subconjunctival hemorrhage, a formed anterior chamber with 1+ mixed cell, seidel negative central self-sealed corneal laceration, seidel negative main wound, no traumatic cataract, and a normal dilated fundus exam. One month postoperatively, his right eye visual acuity was 20/20-2 without correction, his LASIK flap was in place, and there was no traumatic cataract or evidence of intraocular inflammation or infection.

## Discussion

Intraocular foreign bodies occur in 18-41% of ruptured globe injuries.1 At least 92% of patients presenting with IOFB's are young men.1 IOFB's can cause damage by direct mechanical tissue, long term toxicity such as metallosis, and increased incidence of endophthalmitis, which ranges 1.3-61%.2 In terms of prognosis of an IOFB injury, greater mass of the foreign body, uveal prolapse, and location of the foreign body in the posterior segment, have been associated with worse outcomes.3,4 Other factors, such as normal lens at presentation and location of the foreign body in the anterior chamber were associated with visual acuity outcomes better than 20/50.4 A unique element of our patient's case was his recent LASIK four weeks prior to injury. A similar case was reported in 2002 at Wills Eye Hospital with a patient who had a full thickness corneal laceration involving the LASIK flap and an IOFB lodged in the superior iris.5 Similar to our patient, the patient in this case report had an excellent outcome, and the authors concluded that it was important not to manipulate or lift the LASIK flap during corneal laceration repair.

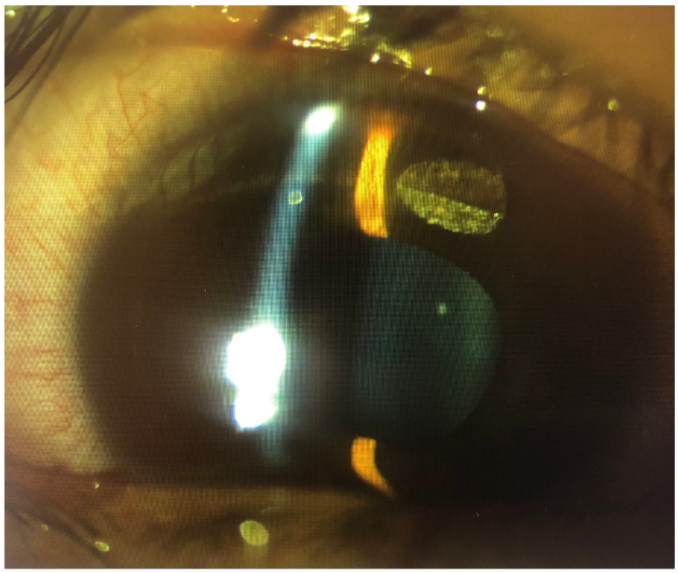

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*Figure 1. Metallic foreign body embedded in the iris superonasally at 1o'clock.*