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## Toxic Posterior Segment Syndrome Due to Reuse of Cannulated Tools

Similarities to TASS should be considered.

Steve Charles, MD

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One of the main misconceptions regarding ambulatory surgery centers (ASCs) that I encounter around the country and, indeed, around the world, is that surgeries in ASCs are performed "on the cheap." Part of that misconception involves having to reuse disposable equipment in order to be profitable. I studied the direct case overhead costs at the Spectra Eye Institute and found that almost 70% of the overhead was due to personnel and less than 20% due to disposable instrumentation. In the following article, Steve Charles, MD, eloquently points out that reusing disposable equipment can be dangerous.

Even from a business standpoint, focusing on surgical equipment to cut costs does not make sense. If 70% of my overhead is personnel, it makes more business sense for me to focus my efforts on proper staff task assignment for the proper skill (and salary) level. For instance, is a skilled and expensive nurse necessary to position a patient or push a bed? Or can this task be assigned to less skilled (and less expensive) staff?

Personnel task management is a key to achieving ASC financial success by reducing overhead. Unfortunately, the ASC physician owners rarely give it much thought. Instead, we tend to focus on the 20% cost of disposable equipment. The bottom line is that reusing disposable equipment not only compromises patient care, but does not make business sense. -Pravin U. Dugel, MD

Toxic anterior segment syndrome (TASS) is an acute, postoperative, noninfectious inflammation that occurs after cataract surgery, corneal transplantation, and glaucoma surgery. The incidence has been estimated at 0.1% to 2.0%; it seems to be increasing worldwide and occurs in clusters (institutional outbreaks). It is the author's contention that a similar phenomenon can occur after vitreoretinal surgery due to reuse of tools with lumens, which includes all scissors and forceps.

### FIBRIN SYNDROME

TASS presents within a few hours after surgery with blurred vision (all patients), severe limbus-to-limbus corneal edema (surgical trauma produces localized edema), 4+ flare, hypopyon, fibrin, minimal conjunctival or episcleral hyperemia, and minimal to no pain (75% to 80% of patients with endophthalmitis have pain).

Vitreoretinal surgeons have reported a similar complication for decades but described it as fibrin syndrome or sterile endophthalmitis.

Fibrin syndrome has been reported after extensive cryopexy, cyclodestructive procedures, intense endolaser to prior detached retina with residual subretinal fluid, use of poor quality silicone oil, heavy silicone oil, iris manipulation or iris retractors especially in uveitis cases, retained lens material, implanting IOLs in uveitis cases, and in proliferative diabetic retinopathy cases with florid neovascularization.

Sterile endophthalmitis has been reported after injecting intravitreal triamcinolone acetonide (Kenalog, Bristol-Myers Squibb), hyaluronidase (Vitrase, Ista Pharmaceuticals, Inc.), and selected pharmacologic agents.

Long term complications of TASS include: glaucoma due to peripheral anterior synechiae and trabecular meshwork damage, chronic inflammation, cystoid macular edem, corneal endothelial damage, iris damage, fixed pupil, and iris transillumination defects.

#### CAUSES OF TOXIC ANTERIOR AND POSTERIOR SEGMENT SYNDROMES

Causes of TASS include surgical issues, drugs and devices, and process issues.

Surgical issues in TASS include: retained lens cortex, iris trauma, iris retractors, endocyclophotocoagulation, and ointment in the anterior chamber.

Device and drug factors in TASS include: Poor quality infusion solutions, intraocular lidocaine, intraocular epinephrine (pH, dose, preservative, stabilizing agents: bisulphites or metabisulphites), intraocular antibiotics (pH, concentration, dose), intraocular triamcinolone acetonide (active drug and preservative), and poor quality viscoelastics. Many of these issues are also applicable to vitreoretinal surgery.

vitreoretinal surgery.

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Process issues that have been proven in TASS include contamination within steam sterilizer (filters, water chambers, and the inside of autoclave), denatured viscoelastics from resterilized cannulas, bacterial endotoxins from gram negative bacteria killed when cannulas are autoclaved, contamination of ultrasonic cleaner, water baths with enzymes or detergents, endotoxins from tap water, detergent or chemical residue on instruments, and incomplete cleaning of reusable cannulas. All of these process issues are also applicable to vitreoretinal surgery. It is important to point out that all scissors and forceps have lumens to permit axial movement of the actuator rod relative to the outer hollow shaft. These lumens are extremely difficult to clean and rinse, especially with 23- and 25-gauge instruments. The intraocular pressure is greater than atmospheric pressure, which forces protein and other biomaterials into the lumen.

#### Benefits of Disposable Instrumentation

Small diameter 25- and 23-gauge scissors and forceps are easily damaged during cleaning and sterilization. Disposable scissors and forceps provide optimal gripping and cutting performance from beginning to end of every case. Disposable tools eliminate the risk of contamination from transmissible spongiform encephalopathy/bovine spongiform encephalopathy/prions, bioburden, hepatitis, HIV/AIDS, denatured proteins, and bacterial endotoxins. Disposable tools reduce per case cost because of elimination of cleanup, sterilization, packaging, storage, backup, and inventory costs including labor and materials.

In summary, fibrin syndrome after vitreoretinal surgery may be due to process issues associated with reuse of scissors, forceps, and cannulas: ie, toxic posterior segment syndrome.

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