

Investigating a TASS Outbreak

Meticulously examining all phases of cataract surgery should reveal the cause of the contamination.

BY THOMAS L. BEARDSLEY, MD

The occurrence of toxic anterior segment syndrome (TASS) is an unexpected and unsettling event that will disrupt an otherwise routine postoperative examination. Because the primary treatment of TASS is prevention, an immediate and comprehensive evaluation of the entire surgical procedure must occur. In addition to this month's cover series in *Cataract & Refractive Surgery Today*, all surgeons should be familiar with a recent, thorough review of TASS published in the *Journal of Cataract and Refractive Surgery*.¹ After a diagnosis of TASS, the entire surgical team must give input on every perioperative process during its review. In order to evaluate all potential sources of TASS completely, I would suggest that each surgery center designate its own team of CSIs (in this case, cataract surgery investigators).

EARLY DIAGNOSIS

The process begins with a timely and accurate diagnosis of TASS as opposed to normal postoperative inflammation or infectious endophthalmitis. I feel it is critical for the operating surgeon to perform the initial postoperative examinations within 24 hours. Only the surgeon has the knowledge of the patient and the details of the operation necessary to judge the appropriate amount of postoperative inflammation or edema.

Many ophthalmologists examine their patients at the slit lamp hours after surgery. Signs of TASS can appear within hours of the procedure, and the CSIs can be notified before the end of the day. The early postoperative examination may also reveal other problems such as an elevated IOP or a leaking wound.

Because there are numerous reported causes of TASS, it can be difficult to isolate a specific etiology in each outbreak. The frequency and pattern of observed cases

can help lead the CSI team. Clusters of cases enable investigators to review commonalities between surgeries and perhaps identify a product or inconsistency common to the affected patients. It will be harder to determine a cause for sporadic or isolated cases after the fact. The postoperative examination is critical to differentiate between unique cases and clusters in which some of the patients' signs are subtle.

NOTIFICATION

After identifying TASS in the postoperative clinic, the surgeon should immediately communicate the finding to the surgery center's director, who should in turn notify the surgeons scheduled to use the ORs next. If the problem is widespread, further intraocular surgery should be canceled. With sporadic cases, the director must decide whether or not to maintain the surgical schedule with an emphasis on diligently following established OR procedures and policies until the problem is identified. The surgery center's director should notify all of the OR staff and convene the CSI team to begin an immediate re-evaluation of the previous day's operations. Of course, the affected patients should be fully informed of the unexpected complication. It may be appropriate to notify the major vendors of the center's surgical supplies, because these individuals may be helpful in identifying a more widespread outbreak.

DATA COLLECTION

The CSI team should re-evaluate all of the products used during the entire surgical schedule that day as quickly as possible. They should check every medication, fluid, and disposable product used pre- and intraoperatively and catalog these items by manufacturer, lot number, expiration date, appropriate concentration, and type

of preservative, if any. This effort may entail dumpster diving for the trash bags if they are still available. Residual, unused product such as balanced salt solution or viscoelastic should be saved for chemical and biological analysis. Samples can be sent to the Centers for Disease Control and Prevention in Atlanta, the vendor, or an independent laboratory for analysis.

In their catalog, the CSI team should also include the OR pack, phaco pack, IOL, lens inserters, and every other disposable product used. The list should also identify which surgical instruments were used and, particularly, the method of sterilization for each case. The CSI team should note any variations in the surgery center's environment such as power outages; a malfunction of the heating, ventilation, or air conditioning; or a disruption of the water supply.

If cases of TASS continue to occur sporadically, the staff may begin the tedious task of recording all of these data preoperatively until the problem is identified. This detailed information may lead investigators toward a common cause not only at the center in question but elsewhere as well in cases caused by tainted products. Nick Mamalis, MD, at the Intermountain Ocular Research Center in Salt Lake City has developed a protocol for data collection in cases of postoperative inflammation, including TASS and endophthalmitis (see his article on page 53).

REVIEW OF OR PROTOCOL

The surgeon, the OR staff, and the investigating team should thoroughly review all aspects of the cataract operation. This process should include the sterile preparation of the patient, the staff's sterile technique, the setup of the phaco machine and intraocular irrigating fluid, the preparation of all intraocular medications, the storage and handling of injectable products such as the IOL, and the cleaning of the surgical instruments on the back table prior to their sterilization.

It may be that staff turnover or stress from an increase in surgical volume and demands for more efficiency resulted in errors or deficiencies in the OR protocol. The surgical staff must remain diligent in the ordering, preparation, and use of every intraocular product. Staff members must avoid cutting corners or absentmindedly deviating from established policies and procedures. The center should institute checks and balances in all critical phases, including the drawing up of intraocular injections.

REVIEW OF CLEANING AND STERILIZING PROCEDURE

Many cases of TASS result from deficiencies in the cleaning and sterilization of the surgical instruments. Any

substance used during the cleaning process can result in TASS if enough of it enters the eye. Detergents, enzymes, and residual metallic ions that are left on instruments by faulty cleaning have been implicated. In addition, heat-stable bacterial endotoxins in sterilizer reservoirs or water baths may contaminate instruments. Denatured viscoelastic trapped in surgical instruments and cannulas can also result in TASS.

Probably the most important area for review by your CSI team is the use and maintenance of the sterilizers. The investigators should sample the water reservoir, the water supply, or the steam generator for impurities. It is important to look for residual endotoxin and other heat-stable bacterial byproducts inside the units.

Everyone involved in the cleaning and sterilization process should be adequately knowledgeable about proper techniques. Someone should consult with the manufacturer to ensure the proper care, cleaning, and maintenance of the sterilizer. Moreover, the hospital or the American Society of Ophthalmic Registered Nurses can provide recommendations on the cleaning and care of instruments. The surgical staff should implement a frequent, vigorous, and thorough cleaning process for the sterilizers that may go beyond the recommended schedule of the vendor.

REPORTING CASES

It may not be possible to determine the cause of TASS in isolated instances, especially if the culprit was a single slipup in protocol during surgery. A local investigative team can and should address recurring cases due to internal problems with the use of a product, sterilization, medication, etc.

In the case of tainted products, a nationwide reporting system may help identify the potential source of the contamination. Physicians should inform their colleagues through meetings or Web-based chat rooms such as Eye-mail on the ASCRS' Web site. The ASCRS has set up a national registry for TASS and postoperative endophthalmitis at the University of Utah under the direction of Dr. Mamalis, as noted earlier. One may also contact Henry Edelhauser, PhD, at the Emory Eye Center in Atlanta (see his article on page 49). If necessary, surgeons may involve the Centers for Disease Control and Prevention through contact with the Emory Eye Center. ■

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1. Mamalis N, Edelhauser HF, Dawson EG, et al. Toxic anterior segment syndrome. *J Cataract Refract Surg.* 2006;32:324-333.