Bandage seals incisions

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Orlando, FL—Intraoperative application of a proprietary in situ gel-forming hydrogel (ReSure Adherent Ocular Bandage, Ocular Therapeutix) to the sutured conjunctival-limbal incision is safe and shows promise as an effective "bandage" for preventing early postoperative wound leaks in eyes undergoing fornix-based trabeculectomy surgery, said Daniel Calladine, MD, at the annual meeting of the American Academy of Ophthalmology (AAO).

The hydrogel bandage was used in a series of eight eyes operated on at the Prince Charles Eye Unit, King Edward VII Hospital, Windsor, England. The surgeries were performed with and without mitomycin-C.

The material was immediately applied over the incision site after placing two interrupted 10/0 nylon conjunctival-corneal sutures with buried knots at either end. Eyes were examined at 1 hour, 1 day, and 7 days with slit lamp photography, Seidel testing, and IOP measurement. There was no evidence of wound leaks and no cases of hypotony, and the material seemed well-tolerated without causing any patient discomfort. Images obtained at the slit lamp showed that the material contoured at the wound edges and selectively adhered to areas of epithelial and conjunctival damage.

Ease of use

"The in situ gel-forming hydrogel is quick and simple to use, and the closure technique combining it with two interrupted sutures is much easier than using 'purse string' sutures," said Dr. Calladine, ophthalmology registrar.

"Although the experience in this small series was positive, it is possible that none of the eyes would have developed postoperative wound leaks without use of the hydrogel bandage," he said. "Therefore, we are now investigating its benefit for protecting and sealing the conjunctival-limbal trabeculectomy incision in a prospective, randomized controlled study in a population at risk for wound leaks—older patients undergoing surgery with mitomycin-C."

The hydrogel bandage is a synthetic, hydrophilic polyethylene glycol (PEG) polymer material that is applied as a liquid and forms a gel in situ on the ocular surface. It comes packaged as a PEG powder with a diluent, an activating solution, and two applicators. A few minutes prior to use, the PEG powder is mixed with the diluent solution in preparation. Then just prior to use, a drop of the liquid PEG and a drop of activating solution are mixed together using the applicator's
rounded plastic end; this begins the gel-forming reaction, which takes about 30 seconds. Before the gel "sets" the resulting product is applied to the ocular surface using the foam tip of the applicator.

The tissue should be thoroughly dried before transferring the hydrogel to prevent migration of the material on the ocular surface prior to gelation. It is usually possible to complete two to three applications from the same mixture, but there is enough material in each package to reconstitute more of the hydrogel if additional material is needed. There is also a blue colorant in the activating solution that enables visualization of the product when it is applied to the ocular surface, but the color quickly dissipates, leaving a transparent hydrogel material over the incision.

"In the first few cases in the trabeculectomy series, we performed three or four transfers of the material, which resulted in a slightly lumpy result at the incision site," Dr. Calladine said. "The material smoothed out over time, but we learned it was unnecessary to use so much of the hydrogel."

He observed that at 1 week, there was usually a small amount of residual hydrogel at the suture sites that came off the eye if the sutures were removed but otherwise remained in place without causing any patient discomfort.