Ophthalmology Times
WRITTEN BY PHYSICIANS, FOR PHYSICIANS
JULY 1, 1998

Repair of canalicular laceration can be simplified

Plastics Pearls

By Daniel E. Buerger, MD

Canalicular lacerations occur relatively infrequently, but their improper management may lead to long-term morbidity from epiphora, discharge, ocular irritation, and dermatitis. While numerous methods for repairing these injuries have been reported, there is no consensus as to which is "best."

Areas of controversy include the need to anastomose the cut mucosal ends of the divided canaliculus directly, composition of the internal stent, and, in cases where only a single canaliculus is injured, whether to use a mono- or bicanalicular stent.

Direct anastomosis of the canalicular mucosa is accomplished with a fine suture, such as 8-0 vicryl. Repair of the cut canaliculus also may be performed by reapproximation of pericanalicular tissue with a larger suture, such as 4-0 or 5-0 chromic. Both methods have been successful at reestablishing a patent canalicular system.[1,2]

Canalicular stents

In the past, there has been some debate as to the need to place a stent when repairing lacerated canaliculi. Recent studies have demonstrated a higher long-term patency rate when stents were placed at the time of the initial injury, and the standard of care in most areas today dictates stent placement to maintain proper alignment of the anastomosis and to prevent stricture after the repair.[1,3]

Until the introduction of the silicone stents, there was debate about what material was best to intubate the cut canaliculus. Many materials have been tried over the years including hair, rubber, bone, silk, nylon, stainless steel, malleable rod, silver wire, and silicone.[2] The ideal stent should be soft and pliable to minimize ocular irritation and tissue trauma and should be inert and stable to remain in place while pericanalicular inflammation subsides. Silicone meets these standards and is readily available.

Mono, bicanalicular stents

One of the biggest choices when repairing canalicular lacerations is whether to use a mono- or bicanalicular stent for the repair. There are numerous advantages in using the monocanalicular stents. They avoid manipulation of the normal canaliculus and the nasolacrimal duct, eliminating any possibility of injury to them. As intranasal manipulation is not required, these stents easily are placed using local anesthesia in an office or procedure room setting.[4]

Other advantages of monocanalicular stents include ease of removal at the slit lamp and no danger of "cheesewiring" or erosion of the punctum as occasionally occurs with bicanalicular stents. For this reason, monocanalicular stents are the stent of choice when the laceration runs through the middle of the punctum.

There are relatively few disadvantages to the use of the monocanalicular stents. Perhaps the most commonly cited is the ease with which they "spontaneously" become dislodged, increasing the chances of postoperative scarring, canalicular stenosis, or obstruction.

Surgical technique

Repair of canalicular lacerations begins with locating the cut ends of the canaliculus (Figures 1 and 2). This is often the most difficult part of the procedure, regardless of the technique employed.

In most instances, direct visualization with loupe magnification is adequate. The operating microscope provides additional

Figure 1

A 3-year-old girl with a canalicular laceration of her left upper eyelid.

Figure 2

Confirmation of the canalicular laceration with a probe through the cut end.

Figure 3

Mini-Monoka monocanalicular stent cut with a beveled end ready to insert.
(Photos courtesy of Daniel E. Buerger, MD)

magnification and is particularly useful when the laceration occurs medially, near the junction of the lacrimal sac.

If the proximal portion of the canaliculus is not apparent despite adequate magnification, various techniques may be employed to assist in locating the cut end. These include passing a pigtail probe into the normal canaliculus[5] or injecting fluid or air into the normal canaliculus while maintaining pressure over the lacrimal sac.[6]

Once the cut end of the canaliculus is identified, a number-0 Bowman lacrimal probe is passed into the cut end of the canaliculus and into the lacrimal sac. A silicone monocanalicular stent, preferably the mini-Monoka (FCI Ophthalmics, Marshfield Hills, MA), is cut with one end beveled to an overall length of 13 to 15 mm (Figure 3).

The punctum is dilated with the punctal dilator and the tube is threaded out the cut distal end. The punctal plug is seated into the punctum with the inserter provided with the mini-Monoka set.

The lacrimal probe is removed from the proximal end of the cut canaliculus. The silicone tube is then threaded into the cut end so the tube is fed into the lacrimal sac. To prevent the tube from kinking or recoiling during insertion, traction must be kept on the cut proximal end of the lid to ensure the canaliculus remains straight and does not kink, preventing the tube from passing.

If the monocanalicular stent is too pliable, threading it into the cut end of the canaliculus proves to be difficult. The mini-Monoka stents are rigid enough to thread with relative ease.

After placing the stent, the laceration is repaired. If the medial canthal tendon has been divided, it is repaired with 4-0 chromic, polygalactin, or polyester suture.

Until the introduction of silicone stents, there was debate about what material was best to intubate the cut canaliculus.

The deep tissue surrounding the stent is reapproximated with 5-0 chromic suture. Care must be taken when placing these sutures to ensure the lid margin is properly realigned. The skin and eyelid margin are then closed with 6-0 plain gut suture.

Postoperative care includes ice compresses to the involved eye and antibiotic ointment to the laceration. Oral antibiotics are prescribed as dictated by the circumstances surrounding the initial injury. The silicone tube remains in place at least 12 weeks.

Editor's comment:

Dr. Buerger describes a nice technique for repairing canalicular lacerations. The learning curve for this procedure is somewhat steep as there are technical nuances involved in identifying the divided end of the canaliculus and in passing the stent. Once these steps are mastered, the monocanalicular stent presents a viable alternative to the more traditional bicanalicular intubation.

—Brian Biesman, MD

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author info

Daniel E. Buerger, MD, is in private practice in Pittsburgh, PA, and is a clinical instructor of ophthalmology at the University of Pittsburgh School of Medicine. He has no financial interest in any of the products discussed.

Brian Biesman, MD, editor of Plastics Pearls, reviewed this column. He is the chief of oculoplastics at Tufts University School of Medicine in Boston.

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