

## Special Section: Dry Eye

### Least invasive means

## Consider the cause when treating late-onset epiphora following occlusion therapy

Try conservative therapy first before turning to invasive procedures, lacrimologist suggests

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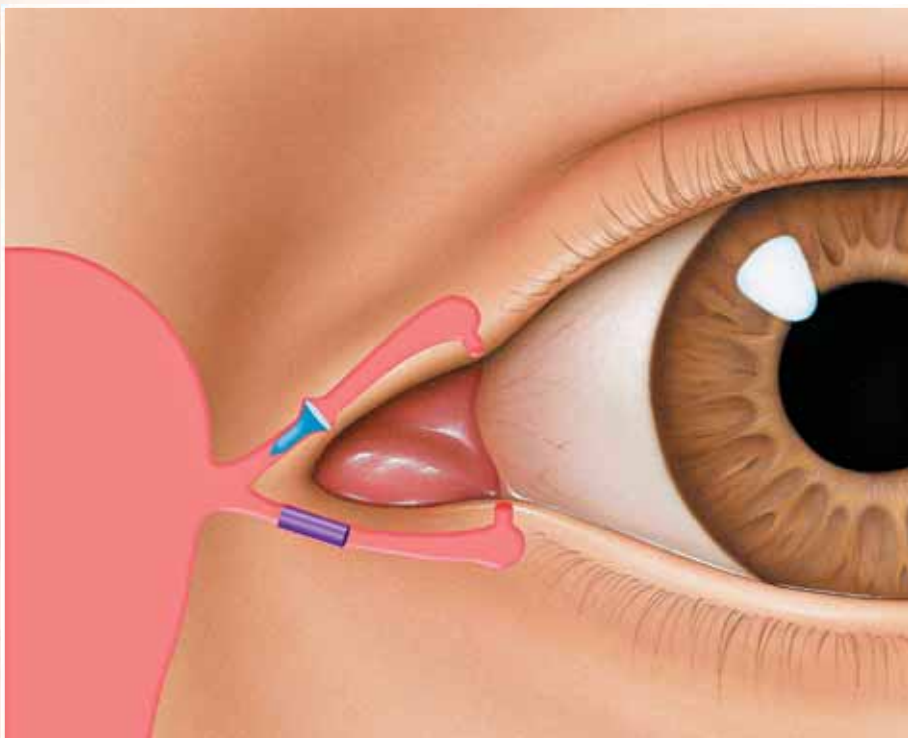
Late-onset epiphora, following months or even years of successful occlusion therapy using Opaque Herrick Lacrimal Plugs (Lacrimedics Inc.), may be attributable to either undertreatment or complete localized canalicular obstruction. Obstruction may be from stricture due to epithelial adhesion or from the accumulation of debris lateral or posterior to the plug. In both cases determining the cause will clarify the least invasive means of resolving the problem.

### Offer more occlusion

If the epiphora is episodic, varying from day to day or even resolving altogether for hours on end, suspect the cause to be persistent dry eye syndrome with resultant reflex tearing. In moderate-to-severe dry eye it is sometimes necessary to occlude not only two, but all four canaliculi.

Should undertreatment prove to be the concern, corrective action aims at: 1) confirming the presence of the previously inserted plugs, and providing additional occlusion therapy in an unoccluded lacrimal system, or 2) confirming the absence of previously inserted plugs, and re-treating the patient with occlusion therapy (may need to use a larger-diameter plug).

To confirm the need to insert non-dissolvable plugs, conduct a temporary trial by in-



**Figure 1** In moderate-to-severe dry eye, a non-dissolvable Opaque Herrick lacrimal plug can be placed in the upper lids and a non-dissolvable or medium-term plug can be placed in the lower lids. (Illustration courtesy of Robert Herrick, MD, and Lacrimedics)

serting one or two dissolvable collagen plugs into each of the unoccluded canaliculi.

If the patient's symptoms improve during this test period, additional occlusion therapy with non-dissolvable or long-term dissolvable (more than 30 days) plugs may provide much-appreciated long-term symptomatic relief.

### Canalicular obstruction

If the epiphora has a more persistent and continuous course, it is more likely that complete canalicular obstruction is to blame. During the blink, debris and lashes are carried by the tear film away from the ocular surface and down into the lower canalicular system. In the presence of a lacrimal plug (and sometimes even in the absence of one) these waste



**Figure 2** Transillumination or blanching of the eyelids can be used to confirm the location and orientation of plugs after insertion.



**Figure 3** The new silicone and synthetic opaque intracanalicular plugs have allowed increased confidence post-insertion due to the ability to determine their presence or absence.

materials can collect, forming a meshwork across the canaliculus. With ingrowth of epithelial cells and neovascularization, a complete canalicular obstruction may develop, with resultant epiphora. Strictures or epithelial adhesions may also occur, with or without the presence of a plug, that occlude the lacrimal system. These adhesions may make it difficult to pass saline, let alone instruments.

Having determined that a canalicular obstruction exists (may or may not include the presence of a lacrimal plug), take conservative steps first before turning to more invasive surgical procedures (such as silicone-stent insertion, dacryocystorhinostomy [DCR], Jones-tube insertion, or balloon dacryoplasty).

Ideally, surgeons will resolve the unwanted epiphora, minimize undue surgical risk, and ensure that the patient continues to benefit from occlusion therapy.

### Re-establishing patency

If a stricture or epithelial adhesion of the lacrimal system is present, one technique used in the past without much success was to treat the patient with topical anti-inflammatory drops. This was rarely successful because stricture of the lacrimal system prevents adequate penetration to the site of the adhesion, especially in the presence of canaliculitis.

A solution to this is to use a cannula, advanced to the site of the obstruction, to flood the canaliculus with topical anti-inflammatory medication, and then treat the patient with a regimen of topical anti-inflammatory medication for 10 to 14 days. In many patients, irrigation of an occluded lacrimal system becomes possible following such treatment; it is suggested that the patient continue with the topical treatment for 7 to 10 days following irrigation to ensure continued patency. This technique is also useful in primary obstructions of the lacrimal system in the absence of plugs.

If the localized obstruction is caused by a thin membrane, surgeons may be able to open it with the tip of a slender #5 jeweler's forceps blade. Surgeons can then advance a West Cannula (Lacrimedics Inc.) to the medial wall of the nasolacrimal duct; the bone will stop its advance. The cannula further disrupts the thin membrane. At the same time, the lacrimal plug can be irrigated through the tear-duct system. Post-procedural treatment with a topical anti-inflammatory/antibiotic is suggested because it may deter recurrence of the membrane or epithelial adhesions.

### Take-Home Message

Late-onset epiphora may be attributable to either undertreatment or localized canalicular obstruction. Determining the cause will clarify the least invasive means of resolving the problem. Robert Herrick, MD, offers tips for assessing and treating the condition. Guided by an accurate diagnosis, the conservative steps outlined may allow patients to continue to benefit from long-term occlusion therapy. In cases where these procedures fail to restore patency, more invasive measures might be indicated.

**Rather than jumping immediately to an aggressive management approach, clinicians should consider the simpler and less-invasive procedures described here.**

If the occlusive membrane is thick and resists disruption with the jeweler's forceps tip or the West cannula, occasionally it may be necessary to remove the membrane while visualizing it directly. This procedure is easily performed at the slit lamp microscope using these steps:

- Inject anesthetic subconjunctivally on the inside of the lid adjacent to the underlying canaliculus.

- Insert a single blade of a long, slender iris scissors through the punctum and advance it medially until you reach the obstruction. Holding the scissors blade vertically, make an incision along the edge of the lid at the junction of the lid skin and the conjunctiva. At the slit lamp, use a #5 jeweler's forceps to hold open the incised canaliculus. The inflammatory membrane will have a unique reddish granular appearance that distinguishes it from the normal lining of the canaliculus. Use a toothed forceps to grasp the membrane, and then excise it completely under the direct slit lamp view.

- If a surgeon visualizes the lacrimal plug medial to the membrane, one may remove it, too, using the jeweler's forceps under direct visualization.

- Place two or three nylon 9-0 sutures across the original incision at the lid margin

**Figure 4** The new patented Opaque Herrick Lacrimal Plugs are uniquely visible post-insertion using transillumination or blanching of the eyelid.



to ensure healing by primary intention.

This procedure should relieve the patient's epiphora. The incision will likely disappear within 3 to 4 weeks. If dry eye symptoms recur, it may be necessary to reinstate occlusion therapy with plugs in an effort to retain an adequate lubricating tear film. In that instance (and in general), it is best to occlude the upper canaliculi first, because this allows the pre-ocular tear film to be more evenly distributed across the ocular surface, while ensuring that the primary exit pathway re-

mains open (conducting ocular debris and hypersecretion away from the eye).

#### **Simple, sensible remedies**

Comprehensive lacrimology is a challenging new subspecialty that requires a unique set of skills to treat patients successfully. This also means selecting appropriate means of correcting complications that occasionally accompany occlusion therapy with plugs. Localized strictures, epithelial adhesions, and canalicular obstruction due to debris lateral

to an intracanalicular plug are some of the complications physicians may encounter.

Rather than jumping immediately to an aggressive management approach using silicone-stent insertion, DCR, or Jones tubes, clinicians should consider the simpler and less-invasive procedures described here. In cases where these procedures fail to restore canalicular patency or where there is obstruction of the nasolacrimal sac, a more invasive measure might be indicated.

A thin occlusive membrane often can be punctured with one blade of a slender jeweler's forceps. A thicker membrane may warrant excision under the slit lamp view using slender iris scissors. Both techniques are safe and effective ways to remedy canalicular obstruction associated with occlusion therapy. These conservative steps should be explored extensively before taking more invasive measures.

Occlusion therapy is a viable means of providing long-term symptomatic relief to the many patients suffering from dry eye symptoms and related tearing disorders. In managing the complications of occlusion therapy, it is important to determine the cause. Guided by an accurate diagnosis, the conservative steps outlined above may allow patients to continue benefiting from occlusion therapy long after concerns such as late-onset epiphora are resolved. ○ T

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**FYI**

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