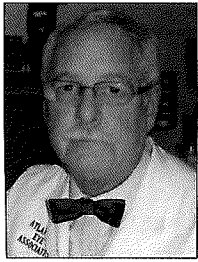


Intraductal drug delivery effective in meibomian gland dysfunction

This route of administration may also prove useful for injecting stem cells or nonsteroidal anti-inflammatory drugs.

by Mark R. Flora, OD

Intraductal drug injection is a relatively new treatment modality for meibomian gland dysfunction, having been introduced in 2009 by Steven Maskin, MD, with his development of a disposable cannula specifically for this purpose.



Mark R. Flora

Maskin improved the cannula design, made by Rhein Medical, in September 2012, introducing a new cannula with a rigid tip, an overall diameter of 150 μm and an internal diameter of 38 μm , and increasing its length to 2 mm. This was designed for small particle suspensions. While these changes make intraductal injection

much easier, drug delivery into the duct is not without its challenges.

A diameter of 150 μm for a cannula used in external disease is unheard of, as this is the equivalent of the more familiar "gauge" of 35 and quite small. It is difficult to hold steady while applying pressure to the plunger at the slit lamp. However, it can be done with some practice.

After drawing up 1 cc or 2 cc of the drug to be injected, the needle is removed and replaced with the cannula so injection can proceed.

Maskin, in his report of 25 patients, has shown that meibomian gland probing and lid expression together have been effective in reducing symptoms from evaporative dry eye for up to 9 months in 75% to 90% of these patients.

He has also shown that adding the intraductal injection of dexamethasone

reduced inflammation inside the glands and prolonged the therapeutic effect of probing and expression alone in 95% of patients to 12 to 24 months. The dosage delivered to each gland is approximately 10 μL .

Sixty-nine percent of Maskin's patients received injection to the upper lids and 32% into the lower lids. The number of glands injected varied from six per lid to as many 20.

The procedure would be as follows:

- The eyelid to be treated is prepped with 8% lidocaine gel and a warm compress for 15 minutes;
- The glands are probed and expressed to remove as much of the inspissated secretions as possible and break any intraductal membranes.
- The patient is now ready for dilation of the orifice or intraductal injection or both.

To facilitate insertion of the cannula tip into a meibomian gland duct, Maskin has also developed a dilator probe, also of 150 μm diameter, which may be used to stretch the orifice, making the cannula easier to insert.

For evaporative dry eye, as many of the meibomian glands as possible in both the upper and lower lids should be probed, expressed and injected. Some glands may have atrophied, collapsed and closed as a result of this disease and, therefore, may not be treatable.

Drugs that may be considered for intraductal injection should be in the injectable form and in solution that does not contain a preservative. Large-particle suspensions such as Kenalog (triamcinolone acetate, Bristol-Myers Squibb) will not pass through this very small-diameter cannula. Dexamethasone sodium phosphate, gentamicin, tobramycin and ketorolac are examples of injectable drugs that may be suitable.

In my experience, intraductal injection

of a steroid-antibiotic combination into two or three individual meibomian gland ducts associated with an early chalazion within 5 mm of the lid margin has resulted in a clinical cure of the chalazion in 7 to 10 days, without the need for additional treatment in three patients. Therefore, a diagnosis of chalazion is a new indication for intraductal injection.

Maskin has reported no adverse consequence related to intraductal injection or probing.

There is no CPT code specifically for intraductal injection of the meibomian gland; however, most doctors believe that CPT 11900, intralesional injection, billed per lid injected, is appropriate. As with any experimental procedure, an informed consent from the patient is advised.

Intraductal injection may hold great promise for treating these diseases. Perhaps someday intraductal injection of genetically altered stem cells could effect a "cure" for meibomian gland disease. Perhaps nonsteroidal anti-inflammatory drugs or human growth hormones have some value here as well. It only remains for us to begin using this technique and, of course, clinical studies to prove their value.

References:

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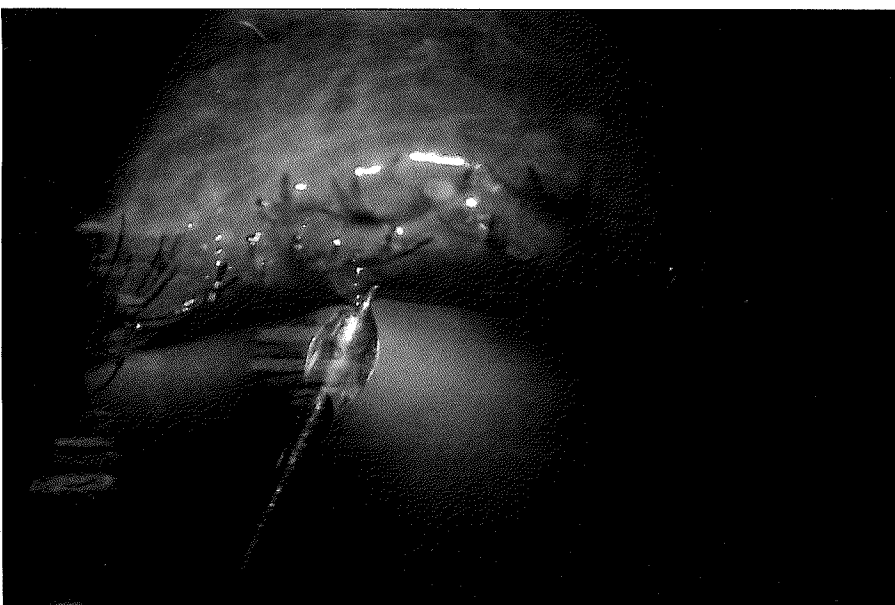
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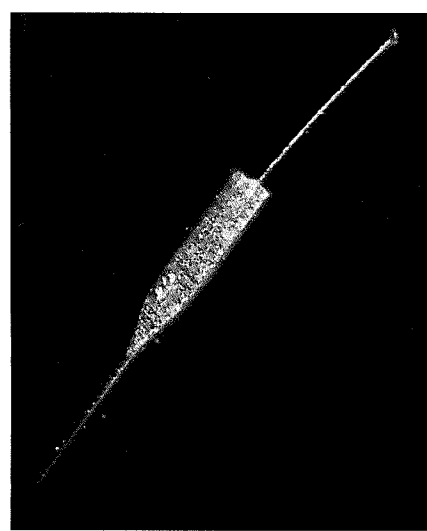
Images: Flora MR



The newer cannula has a rigid tip, an overall diameter of 150 μm , an internal diameter of 38 μm and an increased length of 2 mm.



Intraductal injection of a steroid-antibiotic combination into the meibomian gland duct associated with an early chalazion.



The dilator probe, which is 150 μm in diameter, is used to stretch the orifice, making the cannula easier to insert.