Photo: Johanna Hanno

Why is Grandma Crying?

Epiphora — Impact on vision, outcomes of current treatments, and challenging paradigms

On May 28, 2021, Elin Bohman defended her thesis, "Epiphora – Impact on vision, outcome of lacrimal surgery and investigations with ultra-high-frequency ultrasound" at Karolinska Institutet, Department of Clinical Neuroscience, Division of Eye and Vision. The main supervisor was Eva Dafgård Kopp, MD, PhD, with co-supervisor Maria Kugelberg, MD, PhD, both at Karolinska Institutet, Department of Clinical Neuroscience, Division of Eye and Vision.

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Key points:
- Epiphora *does* impact everyday life.
- Canaliculodacryocystoplasty is an inadequate treatment for obstructions below the lacrimal sac.
- Previous theories regarding the lacrimal sac pump may need to be revised.

Imagine trying to read the price tag in a store, but your eyes are so watery that it is almost impossible or writing while tears fall on the keyboard. You constantly feel that you are looking through a wet window. When you finally go to the doctor, they say, "Don't worry; your eyesight is perfect. You just have a watery eye." Epiphora is a common condition, mainly affecting women over 60, that often receives little attention. Excessive tears create an irregular and ever-changing tear film, affecting refraction and reducing vision. However, in a standard test situation, the visual acuity is seldom affected, leading to the misinterpretation that epiphora is a minor problem. Patients report social discomfort as a result of red eyes and constant eye wiping, and the misperception that they are sad or crying.

This thesis aimed to quantify the functional visual disability experienced by patients with epiphora, survey current management practices, and present the long-term outcome of two lacrimal drainage procedures. In addition, a novel imaging technique, ultra-high-frequency ultrasound, was used to visualize the upper lacrimal drainage anatomy and the lacrimal pump. Limitations on activities in daily life due to visual disability have long been recorded in the Swedish National Cataract Register and were used as an outcome measure. The Catquest-9SF questionnaire was validated for epiphora patients, and their visual disability was found to be on par with those of patients awaiting cataract surgery in their second eye.

We surveyed the current management practices in the Nordic countries regarding acquired lacrimal drainage obstruction. The results indicated that canaliculodacryocystoplasty (probing and silicone stent intubation) is used when treating obstructions below the lacrimal sac, a practice less common elsewhere. However, we found that approximately half of patients with multiple obstructions or nasolacrimal duct obstructions treated with canaliculodacryocystoplasty required additional surgery due to a recurrence of the obstruction. This proportion was significantly higher than when stenosis was confined to the canaliculi.

There is no consensus regarding the use of silicone stent intubation in conjunction with dacryocystorhinostomy. The duration of intubation has received little attention as a factor impacting outcomes. A 97% long-term success rate was found with a comparatively short intubation duration of one week. There may be an optimal duration of intubation with which the possible positive effects are achieved while the negative effects are minimized. Ultra-high-frequency ultrasound and motion tracking demonstrated that the motion of the lateral lacrimal sac wall was greatest in the anterior-posterior direction during blinking. This contrasts with an existing theory regarding the mechanics of the lacrimal pump.

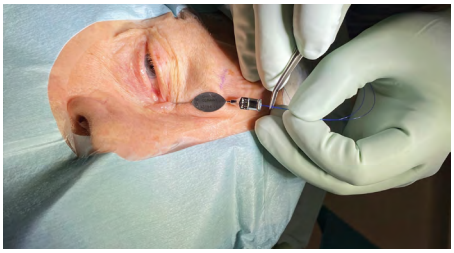

Figure 1. In Canaliculodacryocystoplasty, the lacrimal drainage obstruction is bypassed with a probe and the system is intubated with a silicone stent.

In conclusion, epiphora should be recognized as a debilitating condition affecting everyday life, and that the use of canaliculodacryocystoplasty to treat obstructions in the nasolacrimal duct should be reconsidered in the Nordic countries, as it may be an inadequate form of treatment. Furthermore, a very high success rate is possible with a short duration of intubation in dacryocystorhinostomy. Finally, the current theory regarding the lacrimal pump should be re-evaluated.

Remaining questions:
- Further studies should investigate the effects of intubation duration in conjunction with dacryocystorhinostomy.
- Increased knowledge of the mechanism of active tear drainage could lead to improved treatments.
- Solving the mystery of primary nasolacrimal duct obstruction pathogenesis may provide us with targets for future treatments that inhibit stenosis formation altogether.

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