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Success rate of placement of a bicanalicular stent for partial nasolacrimal obstruction in adults under local, Monitored Anesthesia Care and general anesthesia

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Abstract

Purpose: To study The Kaneka Lacriflow Stent, a self-retaining bicanalicular intubation set that can be placed under local anesthetic, providing a new option to treat epiphora and partial NLDO.
Design: Retrospective chart review.
Subjects: 93 adult patients requiring treatment for a partial NLDO were evaluated. Stents were placed in office setting under local/topical anesthetic or in OR (MAC or GEN). The stent is placed with a stylet, and self-retains due to a widened portion sitting distal to the common canaliculis. It does not require recovery from the nose.
Methods: Outcomes analyzed to evaluate success of stent placement.
Main outcome measure: Success rate of placement of the stent in adults.
Results: Stents left in place for 3 months. Results recorded 1 month after removal. Stents successfully placed in 124 of 136 (91%) eyes. Under local anesthesia in the office setting, 83 of 92 (90%) were placed successfully. Records were complete in 59 patients (78 eyes) and were analyzed further. 33 patients (52 eyes) had stents retained for the full 90 days and had follow-up recorded one-month post removal. Of the patients who retained the stents for 90 days and had full follow-up, 32 patients (51 eyes, 98%) reported improvement in their symptoms, while 1 patient reported no improvement.
Conclusion: Silicone intubation of the NLD in adults is rarely done due to need for general anesthesia. The Lacriflow stent can be successfully placed in the office under local anesthesia offering a new approach for tearing in adults.

Keywords: Nasolacrimal duct obstruction, Kaneka lacriflow stent, Epiphora

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Introduction

Epiphora is an issue impacting the quality of life for many individuals. The incidence of tearing is poorly studied. Dalgeish et al. reported on the results of the nasolacrimal irrigation of every patient presenting for intraocular surgery at the Clinics of Manchester Royal Eye Hospital. He found an incidence of lacrimal obstruction of 11% at age 50 increasing to over 30% at age 80 in a series of 3487 patients.[1] Although this is not a true population study, it is likely representative of the general population.

Woog et al. reported the incidence of symptomatic acquired lacrimal outflow obstruction (SALOO) in Olmsted County, Minnesota, from 1976 to 2000.[2] In reviewing the records in Olmstead County, he identified five hundred eighty-seven patients for an average annual incidence rate of 30.47 per 100,000.

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Woog noted that the incidence of nasolacrimal duct obstruction incidence increased with age, slowly beginning at age 40, and then more rapidly increasing beginning at age 60. He noted that over one-half of all patients with nasolacrimal duct obstruction in the study were older than 65 years. He also noted a higher incidence in women. In his study fully 67 percent had nasolacrimal duct obstruction as the cause of their epiphora. This is likely representative of a selection bias with only the more severe epiphora presenting to the Mayo Clinic for treatment. Woog noted that it would be difficult to determine the true incidence of acquired lacrimal obstruction, as this would entail performing a population based prospective lacrimal evaluation of every individual in the population under study. Woog noted a general increase in incidence of epiphora over the reported period most likely due to an increase in reporting versus a real increase in incidence.

Shin et al. studied the impact of epiphora on quality of life. They found that outdoor activities were the most significantly hindered by epiphora.[3] They also found that indoor activities such as working at a computer, work-related activities, and interpersonal relations showed relatively high scores, indicating that epiphora is a significant issue for patients.

Based on clinical experience, the frequency of epiphora is likely much higher than that reported in the literature. Patients with functional or partial obstruction likely outnumber those patients with complete nasolacrimal obstruction. Thus far there have been few viable, cost effective treatments available for partial nasolacrimal obstruction and given this, little reported on the frequency of non-complete obstruction of the nasolacrimal system. In this paper we report on the use of a novel self-retaining bicanalicular intubation set that can be placed in the canaliculus and nasal lacrimal system under local anesthetic. This offers the possibility of placing the stents in the office under local anesthetic at significantly decreased cost, providing an entirely new option for treating partial nasolacrimal obstruction.

In 2012 Kaneka (Kaneka Corporation, Osaka, Japan) received FDA clearance for a self-retaining bicanaliculi intubation set. The Lacriflow stent is indicated for the treatment of epiphora due to conditions including the obstructions of lacrimal punctum, lacrimal canaliculus or the nasolacrimal duct. It is also intended for use during dacryocystorhinostomy, and congenital nasolacrimal obstruction. The Lacriflow stent is approved for patients 12 months and older. The lacriflow stent consists of a bicanalicular lacrimal duct tube, with a thinner intra-canalicular portion, and 2 stainless steel bougies used for insertion via the canaliculus then removed leaving the tubes in place.

Methods

This study is a retrospective review of our results placing the Kaneka Lacriflow Stent in adults with epiphora due to nasolacrimal obstruction due to punctal stenosis, canalicular stenosis, or partial nasolacrimal duct obstruction. This study was approved by the Lancaster General Hospital Institutional Review Board; a waiver of consent was granted because of the low risk of this research. The stents were placed in the office setting under local and topical anesthetic. Although in office placement was our primary concern, stents were also placed in the operating room under Monitored Anesthesia Care (MAC) or General Anesthesia (GEN) and were also analyzed. Most cases performed in the operating room were secondary to another procedure, such as ptosis repair, ectropion or entropion repair or in cases where an endoscopic dacryocystorhinostomy (enDCR) was being performed on a patient with complete obstruction on one side while the Lacriflow stent was placed on the other side for a partial obstruction.

The Lacriflow stent self-retains due to the differential gauge of the narrower portion of the stent sitting in the superior and inferior canaliculis and a widened portion distal to the common canaliculus in the nasolacrimal duct. This serves to self-retain the stent without the need to tie it in the nose. It also allows easy removal in the office via the canaliculus. The stent is placed via the upper and lower canaliculus utilizing a bougie and does not require recovery from the nose. Due to a hydrophilic polymer coating on the stent, made of polyurethane resin mixture, the stent passes exceptionally easily allowing placement under topical or local anesthetic in the office or in the operating room. In this study, the stent was typically left in place for 3 months.

There are two sizes of stents to choose from, standard and short. The short stent is typically used for women, and for men with a facial structure of average size or smaller. The standard stent can be used in larger individuals. The stent is prepackaged with two bougies. One end of the stent has a blue tip while the other is clear. The surgeon may wish to consistently place the blue tip through either the upper or lower punctum. In this way the surgeon can identify which portion of the stent is in place in the nose when viewing intra-nasally. In practice, it was not that important as we did not view the stent intra-nasally except in cases in which an endoscope was being used. The intra-canalicular rod length measures 25 mm in length and 0.7 mm wide. The nasolacrimal duct portion is a hollow tube measuring 1 mm in width with an open core measuring 0.5 mm intended to facilitate drainage of fluid. The length of the standard tube is 105 mm while the length of the short tube is 90 mm.

If the stents are placed under local or MAC anesthetic, an infratrochlear nerve block is performed as well as a block over the canaliculus and punctum. Lidocaine gel is also infiltrated into the nasolacrimal system with the soft portion of a 24-gauge angiocath. The puncta are dilated with a punctal dilator. One half of the stent with bougie in place is passed through the superior canaliculis perpendicular to the lid for 2 mm then directed nasally with a slight inferior and posterior direction toward the nasolacrimal sac until a hard stop is felt when boney contact is achieved. At this point the bougie is directed inferiorly and slightly posteriorly in a similar manner as probings are performed for congenital nasolacrimal obstruction. Due to the hydrophilic nature of the stent, it is very easy to pass, typically easier to pass than a standard metal probe. Care needs to be taken not to use too much force and create a false passage. Tactile feel will allow the surgeon to feel passage through both the valve of Rosenmueller and the valve of Hasner. There is a blue hash mark indicating the middle of the intracanalicular portion of the stent. If less than half the stent is passed it is likely the stent is too long and a short stent will need to be utilized instead. Once the first portion of the stent is in place, the stent should be grasped near the punctum holding only the soft portion, and the bougie is removed leaving the stent in place. At this

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