An Improvised Indigenous Monocanalicular Intubation System for Canalicular Laceration

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Purpose: To assess the effectiveness and outcome of an improvised monocanalicular intubation with a silicon rod. Method: We cut one part of the lacrimal intubation set as a bevel, and guided it through the punctum, then through the cut end of the canaliculi into the lacrimal sac, and let it coil inside the sac. Two knots were tied at a distance of 1 mm apart over the silicon tubes itself. The first knot was pushed through the dilated punctum into the canaliculi, while the other knot remained outside. The lacrimal tube was cut very close to the outside knot. The two knots with an hour glass like space acted like a fixation device to the sphincter of the punctum, from inside and outside thus preventing slipping or migration. Results: Seven patients were treated by this self improvised monocanalicular lacrimal intubation. All remained free; there was no migration or slipping of the tube. Conclusion: Our improvised design is cheap, readily available and can be operated by any one.

Canalicular lacerations can result from direct or indirect injury to the canalicular system. Traumatic canalicular lacerations require stenting of the injured canaliculus to prevent canalicular obstruction. If surgical repair of the lacerated canaliculus is not appropriate, the patient may develop symptomatic epiphora.

Silicone is the most widely used tube material because of the technical ease associated with its insertion and the low degree of reactivity it induces in surrounding tissues. Numerous surgical techniques have been described for the repair of canalicular lacerations; these can be divided into monocanalicular intubation and bicanalicular intubation techniques.

Reconstruction of the canaliculus with a bicanalicular stent has some disadvantages, including cosmetic problems and the potential to cause injury to the normal canaliculus during intubation. Monocanalicular intubation with Monoka tubes (FCI Ophthalmics, Issy-les-Moulineaux Cedex, France) is a less invasive alternative to bicanalicular intubation and can avert injury to the uninvolved canaliculus. But the major draw back is its cost.
In this study, we describe the epidemiological and clinical characteristics of patients with canalicular lacerations and note the surgical outcomes associated with the use of an Improvised, Indigenous Monocanalicular intubation System for canalicular laceration. It is very cheap, and can be indigenously designed at the operation table itself.

**MATERIALS AND METHODS**

We retrospectively reviewed the 7 patients who underwent our indigenously designed monocanalicular intubation system for the management of monocanalicular lacerations at our center, between July 2008 and October 2010. All study patients underwent surgery under the care of a single surgeon (AB), who had also been involved in their clinical assessment. Data were collected from hospital records.

5 operations were performed under local anesthesia, while two required general anesthesia. Thirty minutes before surgery, a cotton-tipped applicator soaked with 0.125% phenylephrine and 2% lidocaine was inserted over the cut end of the canaliculi for anaesthesia and vasoconstriction. Regional infiltrative anaesthesia, was applied a little distant from the site of laceration, to prevent minimal distortion in anatomy over and around the cut area, to help in better localization of the cut ends. Once the medial edge of the canaliculus had been identified using an operating microscope, a probe was inserted through the punctum into the wound and through the medial end of the cut canaliculus.

We cut one part of the lacrimal intubation set as a bevel, and guided it through the punctum, then through the cut end of the canaliculi into the lacrimal sac, and let it coil inside the sac. Two knots were tied at a distance of 1 mm apart over the silicon tubes itself. The first knot was pushed through the dilated puctum into the canaliculi, while the other knot remained outside. The lacrimal tube was cut very close to the outside knot. The two knots with an hour glass like space acted like a fixation device to the sphinter of the punctum, from inside as well as outside thus preventing slipping or migration. Few marginal suture just over the cut ends of the tube were made, to help in better aposition and union of the cut lacrimal canaliculi.

Re-approximation of overlying orbicularis oculi muscle and tissue (medial canthal tendon, lid margin and skin) was performed layer by layer using a single 8–0 vicryl suture without mucosal anastomosis of the canaliculus.

Patients were instructed to use topical antibiotics (0.3% ofloxacin) and steroids (0.1% fluorometholone) four times per day to prevent infection and canalicular adhesion formation, and were told not to rub their eyes in order to prevent...
early tube protrusion. Each patient was followed up at first day, one week, one month 3 months and six months. Tubes were kept in position for an average of 11.5 weeks.

Subjective as well as objective improvement in tearing was assessed. Surgical success was defined by much improvement in symptoms, complete fluorescein disappearance in a dye disappearance test and ostium patency under irrigation. Failure was defined by a sealed ostium and the presence of persistent tearing.
RESULTS

We studied 7 eyes in 7 patients. Their mean age at presentation was 24 years (range 3–33 years); 3 patients were female and 4 were male.

The sample included 5 lower and 2 upper canalicular lacerations.

Postoperative complications included early tube extrusion (one case), cheese wiring (one case). Tubes were removed between 2 and 6 months after surgery (mean 11.5 weeks). Follow-up ranged from 4 to 12 months.

In all, 6 of 7 eyes showed some improvement in symptoms and exhibited dye disappearance. One patient experienced surgical failure, but without symptomatic epiphora.

DISCUSSION

Silicone intubation was necessary to re-establish patency of the canaliculus.

Monocanalicular intubation is superior to bicanalicular laceration in terms of its ability to prevent damage to uninjured canaliculi. Monocanalicular intubation of the nasolacrimal drainage system with a Monoka stent has been popular since 1992.

However, Monoka stent intubation system is very costly and not readily available. Our Indigenous Monocanalicular intubation System for canalicular laceration is a cheap readily available silicon tube, that can be inserted by any ophthalmic surgeon, with a little bit of patience and understanding. It gives almost at par success with respect to the widely popular but costly Monoka stent intubation system.

REFERENCES