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Case Report

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A simplified approach for bicanalicular silicone tube intubation for the management of canalicular lacerations

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ABSTRACT

We report the surgery of a bicanalicular laceration of the lacrimal system in which a simplified annular intubation of silicone tube had been used. After passing the silicone tube through the canalicular system guided by the prolene suture, the tip of the silicone tube was stuck and advancing it through the lachrymal system was not possible. Then this threaded 6-0 prolene suture was tied to the wall of the silicone tube at the tip and pulled gently from the opposite side. The silicone tube was threaded easily with no obstacle. We hope that our result in this case will create an alternative way for surgeons while repairing canalicular system lacerations

1. Introduction

Direct or indirect injury to the canalicular system leads to canalicular lacerations. Early diagnosis and appropriate surgical management is essential to avoid posttraumatic epiphora. Repair should be performed within the first 24-48 hours after injury, but very successful results are reported with repairs up to five days after injury (Dortzbach and Angrist, 1985; Adenis, 1988; Lindsey, 2000)

Several approaches have been reported for the repair of canalicular lacerations and they include lid repair without lachrymal canal treatment, mono- or bicanalicular tube intubation (Quickert and Dryden, 1970; McCord, 1980; Long, 1988; Reifler, 1991; Ho and Lee, 2006; Jordan et al, 2008; Naik et al., 2008).

To our knowledge, there is limited literature available describing the repair of simultaneous upper and lower canaliculi laceration (Naik et al., 2008).

Here we report the surgery of a bicanalicular laceration of the lacrimal system in which a simplified annular intubation of silicone tube had been used.

2. Case

An eight year old boy, involved in a bicycle accident sustained a laceration in the left medial canthal region accompanied by full thickness superior and inferior canalicular injuries. The patient was taken immediately to the operating room after tests were completed for general anesthesia.

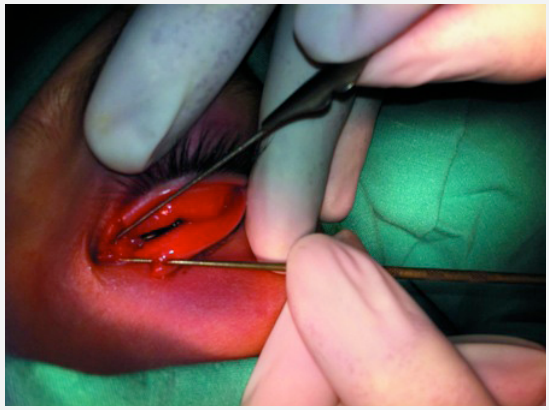

Fig. 1. The tip of dilator was seen at the proximal cut end of the inferior canaliculus while distal cut end was not identified. The integrity of upper eyelid punctum was absent.

Surgical Technique

The punctal dilator was directly threaded into the lower eyelid punctum and the tip of dilator was seen at the proximal cut end of the inferior lacerated canaliculus. The distal cut end of the inferior canaliculus was not identified.The integrity of upper eyelid puncta was absent but the distal cut end of the superior canaliculus was identified by direct visualization as it has white mucosal tissue with wall and lumen. There was no proximal cut end of the upper canaliculus because laceration was at upper punctum (Fig. 1). Lubricating ointment was applied to both ends to facilitate the maneuvers. The round-tipped, pigtail probe was rotated through the distal cut and of the superior canaliculus and appeared at the distal cut end of the inferior canaliculus. A 6-0 prolene suture has been passed through the eye of the pigtail probe. After the superior and inferior portion of the canalicular system is threaded with the suture, the pigtail probe is then passed through the distal portion of the lacerated inferior canalicular system and this portion is also threaded with the 6-0 prolene suture. Then, a traditional method by advancing the silicone tube over the prolene suture and then passing it through the canalicular system guided by the prolene suture was experienced. But the tip of the silicone tube was stuck and advancing it through the lachrymal system was not possible. Then this threaded 6-0 prolene suture was tied to the wall of the silicone tube at the tip and pulled gently from the opposite side. The silicone tube was threaded easily with no obstacle (Fig. 2a-d). Both the ends of the tube are shortened and joined with 6-0 prolene sutures and the tube was rotated. Microanastomosis of the lacerated inferior canalicular ends were performed using 4-0 silk suture and this was followed by repair of the upper punctum. Postoperatively, antibiotic ophthalmic drops and systemic antibiotics were prescribed for a week.

3. Discussion

Canalicular laceration is one of the most frequently encountered canalicular problems. Several surgical techniques have been described for the repair of canalicular lacerations including monocanalicular and bicanalicular intubation. Probing with ring, loop or nasal intubation of the canaliculi has been published (Sisler, 1968; Crawford, 1977; Reifler, 1991; Jordan et al., 2008; Naik et al., 2008). Ring intubation avoids any intranasal manipulation or the need of endoscopic instrumentation.

The use of a pig tail probe was first described by Worst (1962). He used a pig tail probe with a small, sharp hook to pull a large silk suture followed by a silastic tube. Various modifications of this probe ending with a small hole and round tip was described by Beyer, Hanselmayer and Saunders (Hanselmayer, 1973; Beyer, 1974; Saunders et al., 1978).

Proper use of pig tail probe facilitates intubation of the canalicular system makes the location of proximal cut end of the canaliculus very easy. On the other hand, there are some reports indicating some disadvantages of pig tail probe including the potential to cause injury to the normal canaliculus and potential false passage ways during surgery (Saunders et al., 1978; Canavan and Archer, 1979; Welham, 1982). Consideration should be given to manipulate the probe gently. Knowing the fact that common canaliculus is absent in 10% of people, it is recommended not to advance the pigtail probe forcibly.

Bicanalicular silicone stents and monocanalicular

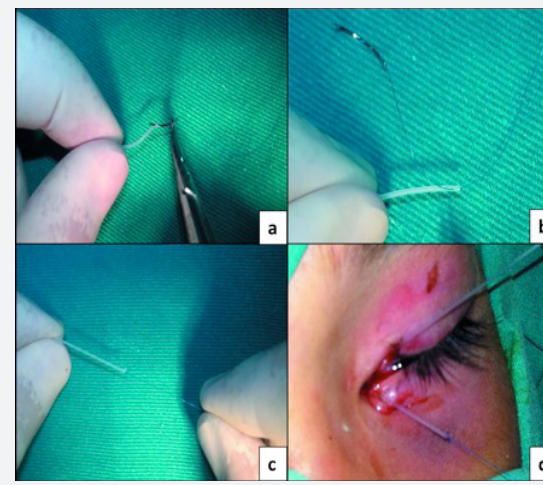

Fig. 2a-c: 6-0 prolene suture was tied to the wall of the silicone tube at the tip **d:** The silicone tube was threaded easily with no obstacle

(Monoka) stents are the leading treatment principal of canalicular injuries. Although monocanalicular intubation is superior to bicanalicular on efor it causes less damage to the uninjured canaliculi, its use in

bicanalicular lacerations is not possible.

To our knowledge, bicanalicular annular silicon tube intubation has been made by advancing the tube over the prolene suture and then passing through the lacrimal system guided by prolene suture. Advancing the silicone tube over the prolene suture is difficult to perform and sometimes it would require much time. Also, passing the lacerated lacrimal openings with silicone tube sometimes be difficult and stuck may also arise as we experienced. At that point, we tied to the wall of the silicone tube at the tip and pulled gently the 6-0 prolene from the opposite side (upper distal cut end). The silicone tube was threaded so easily with no obstacle that we repeated this movement a few times and no obstacle was observed.

We hope that our result in this case will create an alternative way for surgeons while repairing canalicular system lacerations. Further studies should be performed to fortify the effectiveness of this approach.

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