

## Correspondence

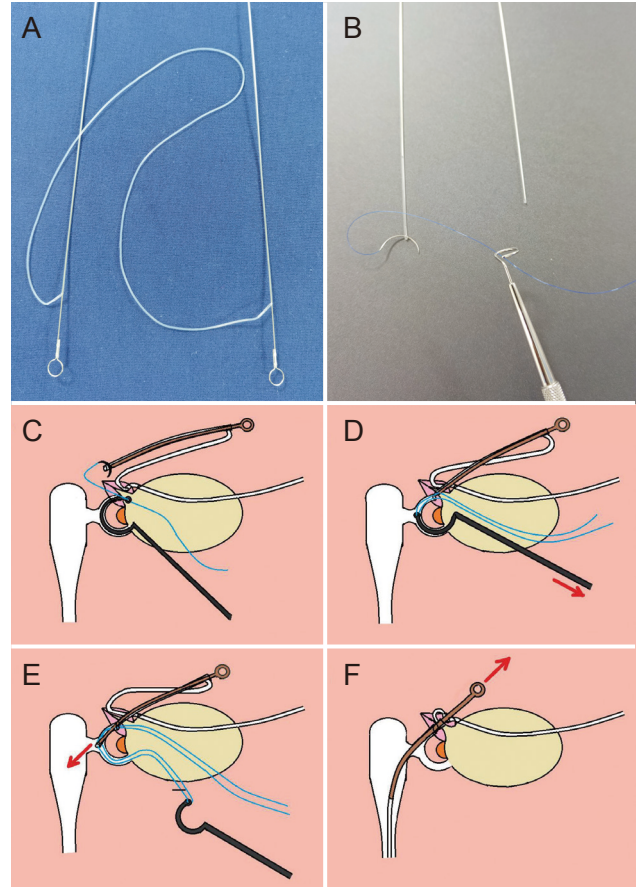
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### Bicanalicular Intubation to Repair Canalicular Laceration Guided by 6-0 Prolene with Pigtail Probe

Dear Editor,

Many techniques have been described for reconstruction of a lacerated canaliculus. Previously described methods for finding the medial cut end of a lacerated canaliculus include use of viscoelastic materials, air, and triamcinolone, or a pigtail probe [1,2]. Identification of the medial cut end of the laceration and intubation of a silicone tube into it are challenging procedures even to an experienced surgeon, especially in cases with deep medial laceration or avulsion, edematous soft tissues, or narrow canaliculi or at several days post-injury [3]. We present a new and effective method for reconstruction in challenging cases using pigtail probe-connected 6-0 Prolene that guides the bicanalicular silicone tube intubation set with a guide wire (BVI Visitec, Sydney, Australia) (Fig. 1A).

A 4-year-old boy was referred to our hospital and presented with a visible inflamed mass on the left upper eyelid, near the upper punctum. He reported a cat-scratch injury 1 week prior. On initial examination, the canaliculus could not be examined because of the patient's lack of cooperation. Primarily, surgery for removal of the eyelid mass was planned at 2 weeks after injury under general anesthesia. However, during the surgery, an additional left upper canalicular laceration was observed. We planned reconstruction of the canalicular laceration with removal of the eyelid mass. Although assisted with a pigtail probe [2], locating and intubating a bicanalicular silicone tube into



**Fig. 1.** Four steps of 6-0 Prolene guided pigtail probe. (A) The bicanalicular silicone tube intubation set with a guide wire (BVI Visitec, Sydney, Australia). (B) The 6-0 Prolene needle connected with pigtail probe is passed through the tip of silicone tube. (C) A pigtail probe is inserted into the opposite punctum and passed through the medial part of the lacerated canaliculus. Subsequently, a 6-0 Prolene needle is inserted into the hole at the end of the pigtail probe and additionally, that same 6-0 Prolene needle is passed through the tip of silicone tube, which was already inserted into the outer segment of the lacerated canaliculus. (D) The pigtail probe was carefully pulled back through the opposite punctum and resulted in pulling the Prolene suture medially to guide the silicone tube into the medial cut of the lacerated canaliculus. (E) The Prolene on the opposite punctum was pulled extensively to introduce the silicone tube into the lacrimal sac. (F) Once the tube is inserted into the lacrimal sac, the Prolene suture in the opposite side is cut and the silicone tube introduced into the nasolacrimal duct and Hasner's valve. Finally, metal probe is withdrawn from silicone tube.

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the medial cut of the laceration was very difficult because of the delay to surgery from the time of injury, resulting in shrinkage of the lacerated end. Instead, we used a new pigtail probe-connected 6-0 Prolene guiding method.

First, a pigtail probe was inserted into the opposite punctum and passed through the canaliculus, lacrimal sac, and medial part of the lacerated canaliculus. Subsequently, a 6-0 Prolene needle was inserted into the hole at the end of the pigtail probe. Additionally, that same 6-0 Prolene needle was passed through the tip of the silicone tube, which had been inserted into the outer punctum of the lacerated canaliculus (Fig. 1B, 1C). The pigtail probe was carefully pulled back to the opposite punctum and resulted in pulling the Prolene medially to guide the silicone tube with guide wire into the medial cut of the lacerated canaliculus (Fig. 1D). The Prolene on the opposite punctum was pulled tightly to introduce the silicone tube into the lacrimal sac (Fig. 1E). Once the tube was inserted into the lacrimal sac, the Prolene on the opposite side was cut, and the silicone tube was introduced into the nasolacrimal duct and Hasner's valve. Finally, the guide wire was withdrawn from the silicone tube (Fig. 1F). Stitches of 6-0 vicryl were passed in a horizontal mattress suture through the pericanalicular tissue after establishment of silicone tube intubation, and the overlying skin was further sutured in separate layers.

At the 6-month follow-up examination, the patient presented with a hard stop on the probing test and no report of lacrimation, indicating successful functional and anatomical reconstruction.

A report on the timing and outcome of laceration reconstruction indicates that elective surgery 48 hours after injury demonstrated successful outcomes similar to those of emergency surgery performed within 48 hours of the injury [4]. This result highlights that anatomically well-reconstructed lacerations can be functionally successful irrespective of the time delay from injury.

We prefer a bicanalicular silicone tube intubation set with a guide wire that is much more easily handled and inserted into the medial cut end of a lacerated canaliculus. This method involves the surgeon pulling the silicone tube toward the nose; however, if the tube is inserted into the medial cut end and lacrimal sac, the next step is very simple. There is a recent report on canalicular laceration repair using a Crawford-type bicanalicular intubation set [5]. As with the previous method, this presented method does not

require tying of the silicone tube with stitches, in which knots may irritate and damage the lacrimal passage lumen or become untied.

In conclusion, this method can be used even in difficult cases where the medial cut end of the canaliculus shrinks in diameter with increasing time from injury. Our experience indicates that surgery performed even after 15 days post-injury can result in successful repair requiring less time.

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## Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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