Prevention of Prolapsed Silicone Stents in Lacrimal Intubation Using an Intrasac Fixation Suture

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Silicone stents are routinely used for the maintenance of patent mucosal passages in patients with nasolacrimal disorders. A common complication associated with the use of silicone stents is lateral migration or displacement of the tubes, which can be difficult to correct. This report describes a modified Quickert-Dryden approach with fixation of the tubes by an intrasac suture. From 1990 to 1996, 53 patients had silicone stents placed by this method with no complications related to tube displacement. The intrasac fixation suture has distinct advantages over other fixation methods.

Silicone intubation of the lacrimal system has been successful in maintaining patency of the drainage system in cases of stenosis, obstruction, laceration of canaliculi, and in conjunction with dacryocystorhinostomy (DCR). Quickert and Dryden described a method of guiding silicone tubing through the lacrimal drainage system using an attached wire probe. During bicanalicular-nasal intubation, both the upper and lower canaliculi are occupied by a continuous loop of silicone. The lateral aspect of the loop lies exposed at the medial canthus between the upper and lower puncta, and the ends of the silicone tubing exit the nasolacrimal duct through the inferior meatus into the nasal cavity.

While relatively little major morbidity occurs with this procedure, a chief postoperative complication of bicanalicular intubation is the lateral displacement of the silicone loop at the medial canthus, resulting in a prolapsed stent. This usually occurs as a result of the patient pulling on the exposed segment of tubing. In some cases, the ends of the tubing can be located in the nose and pulled back into proper position. However, in other cases, the ends are deep within the lacrimal duct or lacrimal sac and cannot be seen. The silicone tubing must be removed prematurely, which can prove challenging depending on the method used to join the ends of the tubing.

A variety of methods have been applied to join and secure the silicone tubes to prevent lateral displacement, each with its own drawbacks. One method uses a lacrimal intubation set with a suture in the lumen. This allows the ends of the silicone tubes to be joined together, but does not prevent lateral displacement of the tubes. An alternative method is to knot the distal ends of the silicone tubes together, creating a mass in the nose. However, lateral displacement of the tubes can still occur with passage of the knot into the inferior nasal meatus, nasolacrimal duct, lacrimal sac, or common canaliculus. In this situation, removal or repositioning of the tubes can be challenging. Romano describes passing the silicone tubing through a segment of silicone sponge rod 5 mm in diameter, creating a larger mass in the nose, which is more difficult to displace into the nasolacrimal duct. The ends of the silicone tubing can also be secured to the nasal vestibule using a non-absorbable suture. This method does not eliminate the potential for lateral tube displacement because the suture tends to erode free from the nasal mucosa.

All of these methods require securing the tubes intranasally and do not allow the precise adjustment of the silicone tube tension at the puncta. Excessive tension on the puncta results in another postoperative complication of intubation, punctal erosion.

An ideal method of securing the silicone tubes that prevents lateral displace-
tubation. It can be applied to all forms of lacrimal in-
ternal access to the lacrimal sac, and transac fixation suture without ex-
tra operative manipulation that risks breakage of the tubing, need for re-
suturing, and preselection of loop size, which cannot be varied intra-
operatively.

This report describes a unique and simple method of placing an in-
tranasal fixation suture without external access to the lacrimal sac, and
without necessary alterations in the standard silicone tubing, which can be
applied to all forms of lacrimal intu-
bation.

**RESULTS**

Twenty-three of the patients who underwent silicone intubation with
an intrasac fixation suture also underwent repair for a lacerated cana-
liculus as illustrated in Figures 1 through 5.

The remaining 30 patients underwented silicone intubation for ob-
structive indications. In these 30 pa-
tients, the initial 6.0 silk knot was
retrieved from one of the puncta and
the knot was repositioned, a proce-
dure analogous to the one illus-
trated in Figures 1 through 5. None
of these patients sustained injury or
permanent dilation of the punctum
through which the tubes were pro-
lapsed.

The average time until tube removal was 7 months (range, 2
months to 3 years). None of the 53
patients who underwent placement of
the intrasac fixation suture had lat-
eral migration of the silicone tubes or
corneal irritation secondary to tube
displacement. One of the 53 patients
developed punctal erosion second-
ary to tube placement.

The intrasac fixation suture is
well tolerated. We found no evi-
dence of bacterial colonization of the
silicone suture. None of the patients
developed discharge, acute or chronic
dacryocystitis, or lacrimal sac tender-
ness while the suture was in place.

**COMMENT**

Placement of a silicone stent in disor-
ders of the lacrimal drainage system
is a well-established and typi-
cally successful procedure. The best

**PATIENTS AND METHODS**

All cases of lacrimal intubation
without DCR, performed by or
under the supervision of 1 of us
(N.T.I.) between 1990 and 1996,
were retrospectively reviewed.
Sixty-six patients who underwent
silicone tube placement with the
intrasac fixation suture were iden-
tified. Of these patients, 53 had
complete follow-up until the time of
tube removal and were selected for
the study. Indication for intu-
bation, results, and complications
were noted.

Most procedures are performed
while the patient is under general an-
esthesia. Prior to intubation, the nose
is packed with a 50:50 mixture of
10% cocaine and 2% lidocaine with
1:100,000 epinephrine. A tech-
nique for silicone intubation, simi-
lar to that described by Quickert and
Dryden,2 is used to place a bicanal-
licular silicone stent (Guibor Cana-
licular Intubation Set; Xomed Sur-
gical Products Inc, Jacksonville, Fla).

While intubation for a lacer-
ated inferior canaliculus is illus-
trated in Figures 1 through 5. None
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through which the tubes were pro-
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**COMMENT**

Placement of a silicone stent in disor-
ders of the lacrimal drainage system
is a well-established and typi-
cally successful procedure. The best
mechanism of tube fixation to prevent the complications of lateral tube displacement and punctal trauma is less well established. During an external DCR, an intrasac suture can be placed that virtually eliminates tube displacement. In this report, we describe a simple method to place an intrasac suture in cases of lacrimal intubation without DCR. We found the intrasac fixation suture to be well tolerated by all patients.
The tubes can be removed in the usual fashion by cutting the lateral loop of the tubing at the medial canthus and retrieving the tubes from the nose. However, finding the ends in the nose can be challenging, especially in children, and we have found removal through a punctum to be a simpler technique. We routinely remove silicone tubes, including tubes from cooperative young children, in the office this way with the patient under local anesthesia. The passage of 3 segments of silicone tubing through one canaliculus and punctum, at the time of suture repositioning or tube removal, has resulted in no cases of canalicular or punctal trauma and is easily performed.

The patient who developed punctal erosion deserves special note. The patient was a child who sustained substantial dog bite injuries, including an avulsed lower eyelid and canalicular tear. The laceration involving the canalculus tear extended inferotemporally 8 cm through the cheek. Substantial contracture of this scar resulted in an unanticipated postoperative traction on the intubated lower lid and punctal erosion. This complication highlights the importance of proper knot placement and tension adjustment at the time of surgery.

Placement of an intrasac suture is simple once the repositioning step is well visualized. The procedure requires no additional equipment or modification to standard lacrimal intubation techniques and adds only a few minutes to the operation. The intrasac fixation suture minimizes the risk of tube displacement and allows careful adjustment of stent tension at the puncta.

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REFERENCES