

# Nasolacrimal intubation in adults

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## Abstract

**Background/aims**—Silicone intubation has been shown to be successful in the management of epiphora in children. The effectiveness of this procedure was assessed in adults.

**Methods**—70 eyes from 53 patients underwent nasolacrimal intubation. Mean age at intubation was 54.7 years. Mean follow up period was 15 months. The results were based on improvement of symptoms.

**Results**—Complete resolution of symptoms was reported in 54.3%. A partial improvement was reported in 14.3%, a transient improvement in 10%, and no improvement in 21.4%. A better outcome was associated with canalicular than with nasolacrimal obstructions (complete resolution of symptoms in 75.9% versus 25%). Only 17.1% have subsequently required dacryocystorhinostomies.

**Conclusion**—Silicone intubation of the nasolacrimal system is a successful procedure in the management of adult epiphora.

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Nasolacrimal intubation with silicone tubing without performing a dacryocystorhinostomy (DCR) was first described in 1968.<sup>1</sup> Since then the technique has been modified to facilitate the passage and retrieval of the tubes.<sup>2,3</sup>

Intubation has been shown to be effective in children, with success rates of about 90%.<sup>4,5</sup> However, there are few reports of nasolacrimal intubation in adults.<sup>6</sup> We reviewed the results of all adults who underwent nasolacrimal intubation for epiphora between January 1994 and January 1997.

## Patients and methods

During this 3 year period 70 eyes from 53 patients underwent nasolacrimal intubation for persistent epiphora despite attempted syringing and probing of their lacrimal passages. The age of the patients at intubation ranged from 18 to 83 years (mean 54.7 years, median 56 years). All procedures were performed under general anaesthesia.

One of two methods was used for intubation; the method described by Quickert and Dryden<sup>2</sup> or that by Crawford.<sup>3</sup> The punctae were dilated. The probe was then passed gently through the canalicular system, overcoming any obstructions, until a "hard stop" was felt in the lacrimal sac. The probe was then rotated to pass down the nasolacrimal duct to enter the nasal cavity under the inferior turbinate. The Quickert probe was retrieved by placing the grooved director under the inferior turbinate to

guide the probe out of the nose. The Crawford probe was retrieved using a Crawford hook to engage the probe and pull it out of the nose. The procedure was then repeated through the other punctum. The tubes were secured either by applying two ligaclips below the inferior turbinate or by stripping the silicone tubing from the silk suture of the Crawford tubes and tying the suture ends together.

The tubes were removed in the outpatient department by cutting the tube between the punctae and then requesting patients to blow their nose. If the tubes did not pass, the patient was reviewed in 2 weeks' time to see if the tubes had passed spontaneously. If the patient did not report passing the tubes, a plain x ray was taken to identify the position of the ligaclips. This facilitated removal of the tubes with either forceps, a suction probe, or a nasal endoscope.

The silicone tubes remained in situ for between 1 and 16 months (mean 5.7 months). The tubes remain in situ in 10 eyes. The mean follow up since intubation was 15 months (range 3 months to 39 months). The mean follow up since extubation was 11.9 months (range 1 month to 32 months).

Two patients had mucocoeles at the time of intubation and two patients had a preceding episode of dacryocystitis which had resolved before intubation.

## Results

The frequency of sites of obstruction is shown in Table 1. The commonest site was in the canalicular system (41.4%). In 20 eyes the site of obstruction had not been noted in the hospital records.

Overall, complete resolution of symptoms was reported in 54.3% of cases. A partial improvement of symptoms was reported in 14.3%. Transient improvement was reported in 10%, and no improvement in 21.4%. DCR was required in 17.1% of cases.

In patients who had canalicular obstructions, 75.9% reported a complete resolution of symptoms. This contrasts with a similar response in only 25% of patients with nasolacrimal duct obstructions (Table 2). No improvement in symptoms was reported in 17.2% of patients with canalicular blocks compared with 40% with nasolacrimal duct obstructions.

Table 1 Frequency of sites of obstruction

Site of obstruction	(n = 70)
Canalicular	29
Nasolacrimal duct	20
Canalicular and nasolacrimal duct	1
Unspecified	20

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Table 2 Comparison between symptomatic improvement in eyes with canalicular obstructions compared with nasolacrimal duct obstructions

Improvement of symptoms	Canalicular (n = 29)	Nasolacrimal duct (n = 20)
Complete	75.9%	25%
Partial	6.9%	30%
Transient	0%	5%
None	17.2%	40%

DCRs were required in 3.4% of cases with canalicular obstructions and in 35% of patients with nasolacrimal duct obstructions.

Excluding eyes which still have tubes in situ the results were as follows.

In patients who had canalicular obstructions, 85% reported a complete resolution of symptoms. This contrasts with a similar response in only 35.7% of patients with nasolacrimal duct obstructions. No improvement in symptoms was reported in 5% of patients with canalicular blocks compared with 35.7% with nasolacrimal duct obstructions.

Neither of the two patients, who had preoperative mucocoeles, described any improvement in symptoms. Of the two patients, who had a previous history of dacryocystitis, one had complete resolution of symptoms and the other had no improvement.

## Discussion

Epiphora caused by obstruction of the lacrimal drainage system is managed initially by syringing and/or probing. Thus, the site of obstruction is identified and its clearance attempted. This relieves symptoms in a number of patients, but it is unlikely that reprobing will give lasting relief of symptoms in cases of restenosis. The management of these patients previously has been to perform a DCR when the obstruction is in the nasolacrimal duct, or to perform a DCR with insertion of silicone tubes when there is a distal canalicular obstruction. Canaliculo-dacryocystorhinostomy may be performed when there is a proximal common canalicular obstruction. As an alternative, we now perform nasolacrimal intubation in these patients.

Nasolacrimal intubation using silicone tubing without a DCR was first reported by Keith in 1968,<sup>1</sup> who found a 73% cure rate in 15 patients between the ages of 2 and 82. This report did not differentiate between the results in children and in adults.

Nasolacrimal intubation subsequently has been shown to be very effective in children when repeated probings were unsuccessful in relieving symptoms. Dortzbach *et al*<sup>5</sup> reported success in 82.5% of children with congenital or acquired nasolacrimal duct obstructions. Beigi and O'Keefe<sup>4</sup> reported a 91.6% success rate in children, although 16% required repeat intubations.

In our study, we report complete resolution of symptoms in 54.3% and partial improvement in a further 14.3%. The results were better in patients with canalicular obstructions (75.9%) than with nasolacrimal duct obstructions (25%).

There are few reports describing nasolacrimal intubation in adults; Pashby and Rathbun described intubations in a variety of patient subgroups.<sup>6</sup> In adults with canalicular or nasolacrimal duct obstructions (n = 39), the overall success rate was 79.5%. They also reported a better success rate with canalicular obstructions (84.4%) than with nasolacrimal duct obstructions (60%).

The severity of the obstruction was not included in our analysis because this is a retrospective study and that information was not recorded in the hospital notes. It would be important to include these data in future prospective studies using this technique.

The procedure of nasolacrimal intubation is less invasive than DCR, and is easier to perform. All patients in this study had the procedure carried out under general anaesthesia, although it can be performed under local anaesthetic. When performed under local anaesthetic, it is preferable to retrieve the tubes using nasal endoscopy as this is less traumatic and better tolerated by the patients. To date, only 17.1% of our patients have required DCRs. This figure may increase with time, because 21.4% of patients reported no improvement in their symptoms, and 10% had only a temporary resolution of symptoms. However, these patients with residual epiphora have elected not proceed to DCR. This is mainly because they have sufficient resolution of symptoms; however, some patients with persistent epiphora declined further lacrimal surgery because they did not want to contemplate major surgery under a general anaesthetic. The majority of patients proceeding to DCR had initially presented with nasolacrimal duct obstructions. DCR should be deferred until the tubes have been removed and reassessed. This is because one patient in our series had no improvement in his symptoms until the tubes were removed.

Balloon dacryocystoplasty (DCP) has been described recently for nasolacrimal duct obstructions. Becker *et al*<sup>7</sup> reported a success rate of 94% following this procedure in children, who previously had had failed probings or silicone intubation. In adults, success rates of between 60% and 89% have been reported,<sup>8,9</sup> with better results in distal obstructions. Song *et al*<sup>10</sup> reported similar results with this procedure; however, there was a 2 month recurrence rate of 45%. With silicone intubation, our results were less favourable than DCP for nasolacrimal duct obstructions.

In conclusion, we found silicone intubation an effective procedure in the management of epiphora in adults. Although results are not as good as those in children, it avoids the need for DCR in a significant number of patients. The results are particularly good in patients with canalicular obstructions. The main advantages of this procedure are that it is easy to perform, it is repeatable, and that it a DCR may still be performed in unsuccessful cases. Further prospective studies should be undertaken using this technique to support these results.

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