SCIENTIFIC REPORT

Long term follow up of nasolacrimal intubation in adults

P P Connell, T P Fulcher, E Chacko, M J O' Connor, P Moriarty

Br J Ophthalmol 2006;90:435–436. doi: 10.1136/bjo.2005.084590

Background/aims: The authors have previously reported a short term mean 15 month follow up of nasolacrimal intubation in adults. The effectiveness of this procedure for long term (mean 78 months) control of epiphora is assessed here.

Methods: 65 eyes from 40 patients who underwent nasolacrimal intubation were followed. Mean age at intubation was 59.2 years. The mean follow up period was 6.2 years. The results were based on long term symptomatic improvement.

Results: Complete long term resolution of symptoms was reported in 50.7%. A partial improvement was reported in 38.5%, and no improvement in 10.7%. A better outcome was associated with a canalicular than nasolacrimal duct obstruction. On long term follow up 16.9% required dacryocysto-rhinostomy (DCR).

Conclusion: Nasolacrimal intubation, a minimally invasive procedure is successful in the long term control of epiphora. Selection of patients with canalicular duct obstruction gives higher success rates with fewer patients subsequently requiring the DCR procedure.

Silicone intubation is often indicated in patients with persistent congenital nasolacrimal duct obstruction and in patients with acquired obstructions of the lacrimal passages. Dortzbach *et al*¹ reported their experience of silicone intubation with varying degrees of obstruction and recorded a higher success rate with mild obstruction and a lower success rate with severe obstruction. All long term interventional procedures have to compare with the gold standard of dacryocysto-rhinostomy (DCR) in the long term control of epiphora.

Nasolacrimal intubation with silicone tubing without performing a DCR was first described in 1968.² Since then the procedure has been modified to facilitate the passage and retrieval of tubes as atraumatically as possible.³

We previously reported a mean 15 month follow up of nasolacrimal intubation in adults.⁴ In that study of silicone intubation in adults, complete success rates of 54.3%, partial success rates of 14.3%, and a DCR rate of 17.1% were recorded. Few studies have addressed the long term control of this procedure in adults.⁵ In this study we evaluate the long term control of epiphora with silicone intubation in adults over a mean interval of 62.5 months.

PATIENTS AND METHODS

During this 7 year follow up, 65 eyes from 40 patients underwent nasolacrimal duct intubation for persistent epiphora despite attempted syringing and probing (S&P) of their lacrimal passages. The findings at preoperative S&P were poorly recorded. The results indicated only proximal "tightness" of the canalicular system, distal "tightness" of nasolacrimal duct, free reflux, or failed S&P. Only five patients had apparent lacrimal pump failure with no obstruction. The age of the patients at intubation ranged

from 30–93 years with a mean age of 59.2 years with a female to male ratio of 2.5:1. All procedures were performed under general anaesthesia. Patients who had previous episodes or a history suggestive of dacryocystitis were excluded from the study. Primary intubation was offered to all non-dacryocystitis patients in this study. The possibility of subsequent surgery was discussed in cases of intubation failure, or following successful intubation, those with incomplete relief or no relief of symptoms. Those with more distal obstructions at preoperative S&P were counselled on the higher failure rates of primary intubation based on previous reports.⁴

All patients in this series were intubated via the method described by Quickert and Dryden.⁶ The difficulty or otherwise of nasolacrimal intubation and retrieval was assessed as was the site of obstruction in 50 out of 65 cases (15 unrecorded). All tubes were secured by applying two liga clips under the inferior turbinate. There were no complications relating to liga clip placement, specifically punctal splitting, canalicular damage, migration, or intranasal damage. Two liga clips were routinely placed and there were no episodes of tube extrusion. The tubes were removed at a recorded time interval in the outpatient department by cutting the ocular side of the tubes and asking the patients to facilitate removal by nose blowing. All tubes were extruded within a 2 week period. The silicone tubes remained in situ for between 3 months and 10 months with a mean of 4.8 months. Those with the longer intubation time had incomplete relief of symptoms at 3 months (partial success), and were extubated later. They were not removed in four of the 65 eyes because of patient preference. The mean follow up since extubation was 69.7 months with a 72 month follow up in those not extubated. There were no tube related complications.

Patients were asked to define the success rates in terms of symptoms rating the success as full, partial, or no resolution. Full resolution was defined as complete absence of tearing over the time interval studied. Partial success was defined as an improvement in patients but with residual tearing over the time indicated, with no resolution defined as no improvement or worsening of symptoms.

RESULTS

The frequency of sites of perioperative obstruction is shown in table 1. The commonest site was in the canalicular system (58%). In 15 of the 65 eyes studied the site of obstruction was not recorded.

Overall complete resolution of symptoms over the time interval studied was 50.7% agreeing closely with our previous report of 54.3%. Partial success was present in an additional 38.5% of those studied, which represented 24% improvement on our previous report. Thus, an improvement of symptoms was recorded in 88.7%. No improvement was recorded in 10.8% of patients. Overall DCR rate was 16.9% with an 85.7%

Abbreviations: DCR, dacryocysto-rhinostomy; NDL, nasolacrimal duct; S&P, syringe and probing

Table 1 Sites of obstruction

Sites of obstruction	No (n=65)
Canalicular	38
Nasolacrimal duct	12
Unspecified	15

(6/7) DCR rate in the no resolution of symptoms cohort, and a 20% (5/25) DCR rate in the partial resolution group. All DCR procedures were performed within 1 year in the no resolution group and in 80% of those in the partial resolution group. One patient in the partial resolution group required DCR at 4.5 years of follow up, because of an exacerbation of his symptoms. The remaining 19 patients in the partial resolution group had an improvement of their symptoms requiring no further surgical intervention.

The difficulty of intubation was recorded in 38.7% of eyes studied. All cases recorded pertained to tube retrieval difficulty. Of these eyes 3%, 44%, and 80% difficulty was recorded in the full, partial, and low resolution of symptom groups, respectively. This is in agreement with previous reports indicating a higher subsequent DCR rate in those with difficult intubations. Additionally the five patients who subsequently required DCR in the partial resolution group had difficult intubations with obstructions at the level of the nasolacrimal duct.

In patients who had canalicular obstruction, 65.1% (25/38) recorded complete resolution of their symptoms and a further 21% (8/38) partial resolution. No resolution was recorded in 13%. The site of canalicular obstruction was not recorded. This contrasted with a 22% (2/9) resolution in those with nasolacrimal duct (NLD) obstruction, a 33% (3/9) partial response, and 44% no response or resolution. DCRs were required in 16.1% of those with canalicular obstruction and in 45% of those with NLD obstruction. Overall DCR rate was 16.9%.

DISCUSSION

We previously reported medium term follow up of silicone intubation in adults with an overall 54.3% complete success, a 14.3% partial success, a 10% transient success, and 21.4% non-success rate. DCR rates were 17.1%. In this series with longer follow up, long term success rates were 50.7% complete success, 38.7% partial success, and 10.7% no success. The success rates were higher for canalicular obstructions than nasolacrimal duct obstructions with a

65% full success and 25% of those having partial relief of symptoms in the canalicular group, comparing to 22% and 33% in the nasolacrimal obstruction group, respectively. The partial success rate for NLD obstruction of 33% was high in this study, but did agree with our previous report of 30%. Overall, the proportion of patients transferring to DCR from this group was low, but primary DCR may be a better option in these patients, particularly with modern DCR techniques, and the higher success rates for complete resolution of symptoms. The DCR rates of 16.1% and 44% compares favourably with the medium term follow up results. Interestingly, we only performed one late DCR in a patient previously allocated to the partial relief group at 51 months follow up following late exacerbation of symptoms.

In conclusion, we found that silicone intubation is successful in the long term control of epiphora in adults. Few reports to date in the literature pertain to long term control.⁷ Although results are not as good as those in children, in the majority of patients it does obviate the need for DCR surgery. Careful selection of patients with canalicular blocks as opposed to NLD blocks may give rise to higher success rates with silicone intubation alone.

Authors' affiliations

P P Connell, E Chacko, M J O' Connor, P Moriarty, Royal Victoria Eye and Ear Hospital, Dublin, Republic of Ireland
T P Fulcher, Mater Misericordiae Hospital, Dublin, Republic of Ireland

Correspondence to: Mr Paul P Connell, Royal Victoria Eye and Ear Hospital, Dublin, Republic of Ireland; drpaulconnell@gmail.com

Accepted for publication 6 December 2005

REFERENCES

- 1 **Dortzbach RK**, France TD, Kushner BJ, et al. Silicone intubation for obstruction of the nasolacrimal duct in children. *Am J Ophthalmol* 1982;**94**:585-90.
- 2 **Keith CG**. Intubation of the lacrimal passages. *Am J Ophthalmol* 1968;**68**:70-4.
- 3 **Kashkoui MB**, Kempster RC, Galloway GD, et al. Monocanalicular versus bicanalicular silicone intubation for nasolacrimal duct stenosis in adults. *Ophthalm Plast Reconstr Surg* 2005;**21**:142-7.
- 4 **Fulcher T**, O' Connor M, Moriarty P. Nasolacrimal intubation in adults. *Br J Ophthalmol* 1998;**82**:1039-41.
- 5 **Ozturk S**, Konuk O, Ilgit ET, et al. Outcome of patients with nasolacrimal polyurethane stent implantation. Do they keep tearing? *Ophthalmic Plast Reconstr Surg*, **2**:130-5.
- 6 **Quickert MH**, Dryden RM. Probes for intubation in lacrimal drainage. *Trans Am Acad Ophthalmol Otolaryngol* 1970;**74**:431-3.
- 7 **Pashby RC**, Rathburn JE. Silicone intubation of the lacrimal drainage system. *Arch Ophthalmol* 1979;**97**:1318-22.