BICANALICULAR SILICONE INTUBATION IN ACQUIRED PARTIAL NASOLACRIMAL DUCT OBSTRUCTION

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ABSTRACT

Purpose: To assess the effectiveness of bicanalicular silicone intubation (SI) in acquired partial nasolacrimal duct (NLD) obstruction.
Design: Retrospective nonrandomized case series
Methods: 72 tear ducts from 53 patients with severe epiphora due to acquired partial NLD obstruction underwent bicanalicular SI. Mean age at intubation was 55.9 years.
The silicone tubes were removed after, on average, 10.4 weeks. Mean follow up period was 29.3 months (range 6 to 66 months). The results were assessed using the Munk score: 0-1: complete success, 2: partial success and 3-4: failure.
Results: Complete success was reported in 47% (31/66). Partial success was reported in 3% (2/66), and no improvement in 50% (33/66). 12% (8/66) was subsequently treated with dacryocystorhinostomy (DCR).
Conclusion: In patients with acquired partial NLD obstruction, we noted a low success-rate for bicanalicular SI. Although it may be considered in patients who refuse DCR surgery, the relatively poor outcome compared to DCR does not justify its systematic use for this indication.

RESUME

But: Evaluer l'efficacité d'une intubation bicanaliculaire réalisée à l'aide de tubes en silicone dans le cadre d'une dacryosténose partielle et acquise.
Design: Etude rétrospective, non-randomisée.
Méthodes: 53 patients (72 voies lacrymales) présentant un larmoiement sévère secondaire à une dacryosténose partielle et acquise ont fait l'objet d'une intubation bicanaliculaire à l'aide de tubes en silicone. L'âge moyen des patients au moment de l'intervention était 55.9 ans.
Les tubes de silicone ont été enlevés après un délai moyen de 10.4 semaines. Le suivi moyen a été 29.3 mois (de 6 à 66 mois). Les résultats ont été évalués sur base du score de Munk: 0-1 : succès complet, 2: succès partiel et 3-4 : échec.
Résultats: Un succès complet a été observé dans 47% (31/66) des cas et un succès partiel dans 3% (2/66) des cas. Aucune amélioration n'a été observée dans le reste des cas (50%) (33/66). 12% (8/66) des patients ont bénéficié par la suite d'une dacryocystorhinostomie.
Conclusion: Chez les patients présentant une dacryosténose partielle et acquise, l'intubation bicanaliculaire à l'aide de sondes en silicone n'est associée, dans notre expérience, qu'à un taux de succès très limité. Bien que ce traitement puisse être envisagé chez les patients qui refusent la dacryocystorhinostomie, ce faible taux de succès comparé à celui de la dacryocystorhinostomie ne justifie pas son utilisation systématique dans cette indication.

KEY WORDS

Silicone intubation, Nasolacrimal duct obstruction, Acquired partial, Lacrimal surgery

MOTS-CLÉS

Intubation canaliculaire, Sonde en silicone, Dacryosténose acquise partielle, Chirurgie lacrymale

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INTRODUCTION

The traditional surgical treatment of an obstruction of the nasolacrimal duct (NLD) is based on dacryocystorhinostomy (DCR), with a success rate of more than 90% (2,3). As an alternative, a variety of non-invasive treatment modalities have been proposed, which aim to mechanically restore patency. Probing was shown to have limited success of about 50% in adult patients (8). Silicone intubation (SI) alone without a DCR was first reported by Keith in 1968 (8). He did not differentiate, however, between adults and children.

Only few studies have investigated the efficacy of SI in the management of (partial) lacrimal obstruction in adults. (1,4,6,7,15). Success was noted in 22% to 62%. These studies only investigated a limited number of patients (varying from 5 to 39 patients). We reviewed the results of a large series of 53 adult patients who underwent SI (72) for partial NLD obstruction between February 2001 and February 2006.

MATERIAL AND METHODS

Between February 2001 and February 2006, 72 tear ducts from 53 patients underwent bicanalicular SI for severe epiphora due to acquired partial NLD obstruction. The mean age of patients at the time of surgery was 55.9 years (SD 13). There were 43 females and 10 males. The right side was affected in 20 patients, the left side in 14 patients and both sides in 19 patients.

The severity of epiphora was evaluated subjectively according to the scale proposed by Munk (Table 1) (14). Patients underwent bicanalicular SI if they complained of severe epiphora (Munk grade 3 (n=1) or 4 (n=71) that existed since at least 3 months. At examination, they had a high tear meniscus and a negative Jones-1 test (dye disappearance test). Furthermore, during the Jones-2 test (irrigation through the inferior lacrimal punctum), patients reported some fluid coming into the nose with reflux through the superior punctum (partial stenosis of the NLD). In addition, a digital subtraction dacryocystography (DCG) was performed to confirm the site and the extent of the (relative) obstruction and to rule out dacryolithiasis.

Table 1: *Munk score*

0	No Epiphora.
1	Occasional epiphora requiring drying or dabbing less than twice a day.
2	Epiphora requiring dabbing two to four times per day.
3	Epiphora requiring dabbing five to ten times per day.
4	Epiphora requiring dabbing more than ten times daily or constant tearing.

Patients did not undergo nasolacrimal intubation if they showed signs of pseudo-epiphora (any corneal staining with fluorescein, a Schirmer test less than 5 mm, blepharitis or conjunctivitis), any eyelid or punctal malposition, dacryocystitis, or any signs of inadequate tear pump functioning such as inadequate orbicularis oculi function or scarring of the lower eyelid. All patients were 18 years of age or older. Patients with a history of lacrimal surgery were excluded.

Surgical procedure

Under general anaesthesia, the nose was packed with cotton soaked in Xylometazoline 10 mg/ml HCl Sandoz®. The inferior and superior puncta were dilated. The Bowman probe was then passed gently through the inferior canalicular system, overcoming any obstruction(s), until a 'hard stop' was felt in the lacrimal sac. The probe was then rotated to pass down the NLD to enter the nasal cavity under the inferior concha. The probe was then withdrawn via the inferior punctum. One of the two following methods was used for intubation: the method described by Ritleng (13) (P Ritleng, 20 Boulevard Gallieni, BP 111, Issy-les-Moulineux, France) or those proposed by Bernard and Fayet (Bernard JA and Fayet B, 20/22 Rue Louis Armand, BP 40062, 75722 Paris Cedex 15, France). The Ritleng probe was inserted into the canaliculus and advanced to the nose. The guide was threaded through the probe and removed from the nose using a hook. The Ritleng probe was then removed from the lacrimal system. With the second method, intubation was carried out using a silicone tube connected by each of its extremities to a malleable steel guide. The probe was retrieved by placing a grooved director under the inferior turbinate to guide the probe out of the nose, after which the steel guide was cut from the silicone tube.

The procedure was then repeated through the other punctum. The two silicone tubes were tied together with a Prolene 6,0 suture and fixated to the lateral wall of the nose. All patients were instructed to use topical dexamethason with gentamicin (dexamytrex®) 3 times daily for 2 weeks. The tubes were removed in the outpatient department by cutting the suture at the lateral wall of the nose and cutting the tube between the lacrimal puncta.

According to the protocol for SI in lacrimal surgery in our institute, the silicone tubes remained in situ for 10.4 weeks on average (SD 5.1). The mean follow up since intubation was 29.3 months (SD 17.8, range 6 to 66 months). No major complications were noted. Slight nasal bleeding was observed in 4 cases, which was easily controlled. No patient developed dacryocystitis or dacryolithiasis during silicone tube-wear. 6 silicone tubes could not be found at the day when removal was planned. In 4 cases, the silicone tube fell out early, respectively after 1 (2x), 6 and 7 weeks, due to sneezing, rubbing, or accidentally. In 4 other cases, the silicone tube was removed early, respectively after 1, 3 (2x) and 5 weeks, because of a slit inferior punctum.

RESULTS

Overall, complete success was reported in 47% (31/66). Partial success was reported in 3% (2/66). Failure was reported in 50% (33/66). DCR was required in 12% (8/66) of the cases. 38% (25/66) refrained from additional treatment. 6 patients in total were lost to follow up.

In the cases where the tube fell out early (4 cases), or had to be removed early due to a slit inferior punctum (4 cases), 2 reported complete success, 4 reported failure and 2 were lost to follow up.

DISCUSSION

In this study, we report complete success of bicanalicular SI in 47% of the cases. For NLD obstructions, Fulcher *et al*., reported only a 22% complete success (n=12) after 6,2 years of follow up (1,4), whereas Pashby *et al*., found a success rate of 60% (n=5) after a follow up period of 9 months (15). Kashkouli *et al.,* found a 59% complete success rate with bicanalicular SI in adults with incomplete NLD obstruction (n=22) after a mean follow up period of 15 months (7). Compared with these results, our series shows a 47% complete success rate in a much larger group of patients with partial NLD obstruction (n=53). None of the previous studies uses the well-established Munk score in their follow up assessment, which might as well explain the lower success rates in our patients.

Although the reported success rates of SI are lower than those of DCR, advantages of SI (alone) include the conservation of the normal anatomic pathway (as opposed to the creation of a non-physiologic bypass of the NLD), the shorter operating time, and the smaller risk of haemorrhage (7).

Several authors have reported slitting of the punctum and canaliculi after bicanalicular SI of the nasolacrimal drainage system (7,10,11,16). Other complications of bicanalicular SI include tube displacement, infection, corneal abrasion, tube breakage, and retained tube after severance of the canthal loop. Additionally, removal of bicanalicular tubing has been problematic without recruiting a nasal endoscope in some cases (7). In this series, there were 4 slit inferior puncta, and 4 premature extrusions of the tube. There were no problems removing the tube.

Recently, another non-invasive treatment modality, i.e. balloon dacryocystoplasty, has gained popularity. This is especially prevalent in the treatment of congenital NLD obstruction. Previous studies have reported success rates for balloon dilatation varying between 20% and 90% utilizing a variety of techniques (5,6,9,12,17).

In conclusion, the overall success rate of SI (as a single procedure) in patients with partial NLD obstruction is low compared to DCR. DCR (with or without SI) remains the golden standard in the treatment of this condition. The main advantages of SI are that it is easy to perform, less time-consuming and less traumatic than DCR. However, although it may be considered in patients who refuse DCR surgery, the relatively poor outcome compared to DCR does not justify its systematic use for this indication.

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