ORIGINAL ARTICLE

Repeat DCR with Silicone Tube Intubation : A Prospective Study

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Abstract

Forty patients who were operated upon for chronic dacryocystitis six months to two years before presented with history of persistent watering and discharge. Repeat DCR with silicone tube intubation was performed in all the patients. Post-operative follow-up for a period of 12-18 months revealed absence of symptoms in 38 patients while 2 patients persisted with watering and discharge despite uncomplicated surgical procedure.

Key Words

Dacryocystorhinostomy (DCR), Silicone tube intubation (STI), Dacrocystography

Introduction

DCR is often considered to be a messy, laborious and non-rewarding surgery by most ophthalmic surgeons. However, no one can deny that the problem of epiphora and discharge needs to be alleviated for the patient.

Despite meticulous surgery, failures are often met with. The two most common causes of DCR failure are common canalicular obstruction and obstruction at the rhinostomy site (1). Besides, poor surgical technique including non-opening of the lacrimal sac (very rare), also contributes significantly to its failures.

A dacryocystogram (DCG) is often helpful in the evaluation of DCR failures (2). This contrast roentgenogram localizes the obstruction and possibly reveals other pathology such as dacryoliths or sequestered ectasias of the lacrimal sac.

Material and Methods

Forty patients were randomly selected for repeat DCR surgery because of the constant complaint of epiphora and discharge following previous DCR surgery. The primary DCR surgery was done 6 months to 2 years before.

The patient's age varied from 22 years to 56 years. There were 14 male patients and 26 female patients in the study group. Among 14 male patients, 10 patients had involvement of the right side while 4 were having the pathology on the left side. Among 26 female patients, right side was involved in 17 patients and left side in 9 patients.

Before surgery, a dacryocystogram using 76% urograffin was done in all the patients, which revealed the cause of failure of the previous surgery and also acted as a guide during repeat surgical procedure.

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A lacrimal outflow irrigation was done in all the patients which also differentiated between the two common causes of DCR failure i. e., common canalicular obstruction and obstruction at the rhinostomy site.

During repeat DCR surgery, the anterior crus of the medial canthal tendon was incised to gain full exposure of the fundus of the lacrimal sac. The previously made bony ostium was enlarged anteriorly to expose virgin nasal mucosa. This virgin nasal mucosa was incised in a way that affords inspection of the internal aspects of the previous rhinostomy site to rule out any bone, scar tissue, dacryolith or an adherent turbinate as the cause of initial DCR failure. Any common canalicular obstruction was ruled out using the bowmann`s probe.

Because of the deranged anatomy from previous surgery, it was not possible to fashion the posterior sac and nasal mucosal flaps. Silicone tube was intubated in all the patients and its two ends sutured within the nostril. After this, the anterior sac and nasal mucosal flaps were anastomosed and the wound closed.

The silicone tube was removed about 1 year after surgery. All the patients were followed-up regularly for about 12 to 18 months. The follow-up included any symptom of watering and discharge, wound infection, and position of the silicone tube between the two puncta and within the nostril.

Results

Dacryocystogram (DCG) performed on the 40 study patients showed that, in 37 patients, no dye could be seen beyond the canalicular end. This revealed that a dense fibrous tissue was obstructing the common canalicular end and / or the bony ostium. However, in 3 patients, dye was seen in an intact sac, which revealed that during previous surgery, the lacrimal sac had not been opened. This cause of DCR failure, although very rare is due to surgical inefficiency.

At the time of repeat surgery, there was an obstruction at the common canalicular end in 8 patients. This was confirmed by lacrimal probing. In 29 patients, closure of the bony ostium by a dense fibrous scar was revealed. However in 3 patients where dacryocystogram had revealed an intact sac, the surgeon that time had anastomosed the anterior nasal mucosal flap with the superficial muscular fibres. In these 3 patients, the false anastomotic flaps were cut and the anterior nasal mucosal flap was anastomosed with a freshly created anterior sac flap.

All the 40 study patients were followed-up regularly for 12 to 18 months. The patients were examined weekly for 1 month, every 2 weekly for 2 months and then monthly. During each follow-up, the patients were asked for any history of watering and discharge. The position of the silicone tube in-between the two puncta and in the nostril was also noted. In 1 patient, at the time of 2nd follow-up (after 2 weeks), the silicone tube was absent. The patient however, was asymptomatic and also unaware of the absence of silicone tube, which might have slipped during blowing of the nose.

Out of 40 patients, 38 patients were asymptomatic, while in 2 patients, there was a history of persistent watering and discharge at the end of the follow-up period.

DCG in failed DCR - showing an intact sac with nasolacrimal duct block, despite a big osteotomy opening : result of surgical inefficiency. A lacrimal cannula is seen in the lower canaliculus.

Discussion

DCR with silicone tube intubation has been accepted as a highly successful procedure in patients with history of epiphora and discharge following chronic dacryocystitis. A review of literature reveals a success rate of 90 - 95% (3-5).

Failure of DCR may be attributed mainly to anastomosis failure due to defective identification and apposition, sagging down of flap anastomosis, closure between two flap complex, ostium closure and common canalicular closure.

Mc Pherson and Egelston noted that 3 out of 7 patients in their study who underwent a second operation were found to have a dense scar tissue present at the osteotomy site (6). In our study however, 29 out of 40 patients were found to have a dense fibrous scar closure of the bony ostium. This stresses upon the need of making a comparatively big osteotomy hole. Linberg and colleagues documented that surgically created ostia (average 11.84 mm diameter) undergo dramatic narrowing during the first few months of healing (average 1.80 mm diameter post-operatively) (7). Thus complete ostium closure remains a frequent concern among DCR failures.

Pico stated that in every instance, the cause of failure was found at the second surgery to be an obstruction of the new drainage channel by an occluding membrane, which on histologic examination was shown to be composed of organized granulation tissue (8). Allen and Berlin reported 20 failed DCR`s with the post-operative obstruction distil to common canaliculus (9). In their study, there were 13 cases with cicatricial closure of the rhinostomy site with granulation tissue and 3 cases with scarring of the osteotomy to the turbinate or septum.

In our study, obstruction of the common canalicular end was the cause of primary DCR failure in 8 (20%) patients. Mc Lachlan *et. al.* also proposed the higher incidence of common canalicular obstruction as a cause of DCR failure (10). Thus we recommend, that a lacrimal probe in the canaliculus should be kept till the closure is completed to avoid injury or strangulation of the common canlicular end by suture.

Conclusion

A high success rate in primary DCR can be attributed to the following factors :

- Meticulous surgery and proper identification of the structures.
- A comparatively big osteotomy opening particularly in children and young patients.
- STI in all DCR surgeries.
- Tight apposition of the sac and mucosal flaps.
- Use of absorbable suture material for anastomosis because nonabsorbable sutures are known to provoke scarring either directly or indirectly.

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