Repeat DCR with Silicone Tube intubation : A Prospective Study.

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Certified that the study "Repeat DCR with Silicone tube intubation: A prospective study" is the original work undertaken by me in the department of Ophthalmology SKIMS Medical College Hospital. I also certify that the work once accepted will hold the copyright for the Boolean Education (USAIM) and that the study will not be submitted to any other journal for publication.

Sd.

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ABSTRACT

Purpose:

Purpose of the study is to see the results of repeat DCR surgery with silicone tube intubation in patients with constant complaint of epiphora and discharge following previous DCR surgery

Material and methods:

Forty patients who had undergone DCR for Chronic Dacryocystitis six months to two years before and had persistent complaint of watering and discharge were randomly selected for repeat DCR surgery. Age of patients varied from 22 years to 56 years. There were 14 male patients and 26 female patients in the study group. Before surgery, a dacryocystogram (DCG) 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. Lacrimal outflow irrigation was done in all the patients. DCR with silicone tube intubation was done in all the patients. All the 40 study patients were followed-up regularly for 12 to 18 months. 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.

Results:

In 37 patients a dense fibrous tissue was obstructing the common canalicular end and / or the bony ostium. At the time of repeat surgery there was an obstruction at the common canalicular end in 8 patients. In 29 patients, closure of the bony ostium by a dense fibrous scar was revealed. However in 3 patients dacryocystogram had revealed intact sacs. All the 40 study patients were followed-up regularly for 12 to 18 months. In 1 patient, at the time of 2nd follow-up (after 2 weeks), the silicone tube was absent. 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.
**SCOPE OF THE PROBLEM**

Chronic dacryocystitis is rarely associated with severe morbidity unless caused by a systemic disease. The primary morbidity is associated with chronic tearing, matting of eyelashes, and conjunctival inflammation and infection.

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.

Repeat DCR surgery is itself more complicated and more difficult because of so many reasons. Because of previous surgery, it is difficult to localise various anatomical structures. Intraoperative haemorrhages are more common than primary surgery because of fibro vascular nature of scar. Sometimes it is very difficult to fashion the posterior flaps of nasal mucosa and lacrimal sac. But repeat surgery can be a success if performed meticulously, at proper time and of course with silicone tube intubation. Silicone tube intubation is necessary in every case of DCR especially in case of repeat DCR.

A dacryocystogram (DCG) is often required 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% urograflin 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.

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 were 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 bowman’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.
OBSERVATIONS AND OUTCOMES

Table 1: show the sex distribution.

There were 14 male patients and 26 female patients in the study group.

Table 1.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of patients</td>
<td>14</td>
<td>26</td>
</tr>
</tbody>
</table>

![Sex distribution](image)

Table 2: shows distribution as per eye involvement

Right Eye was involved in 27 patients and left Eye in 13 patients.

Table 2

<table>
<thead>
<tr>
<th>Eye involvement</th>
<th>Right</th>
<th>Left</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>Female</td>
<td>17</td>
<td>9</td>
</tr>
</tbody>
</table>
Table 3: shows results of pre operative Dacryocystogram (DCG)

Table 3

<table>
<thead>
<tr>
<th>Dye beyond the canalicular end</th>
<th>Absent</th>
<th>Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of patients</td>
<td>37</td>
<td>3</td>
</tr>
</tbody>
</table>
Dacryocystogram: showing intact Lacrimal sac in patient operated for DCR.
Table 4: shows intraoperative findings

<table>
<thead>
<tr>
<th>Intraoperative findings</th>
<th>Bony obstruction</th>
<th>Fibrous scar</th>
<th>Intact sac</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of patients</td>
<td>8</td>
<td>29</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 5: shows follow-up protocol

<table>
<thead>
<tr>
<th></th>
<th>1st month</th>
<th>2nd month</th>
<th>3rd -18 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>weekly</td>
<td>weekly</td>
<td>Fortnightly</td>
<td>Monthly</td>
</tr>
</tbody>
</table>
Table 6: shows post operative results at the end of follow-up period

Table 6

<table>
<thead>
<tr>
<th>Post operative results</th>
<th>Asymptomatic</th>
<th>Symptomatic</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of patients</td>
<td>38</td>
<td>2</td>
</tr>
</tbody>
</table>

![Post operative Results](image.png)
ANALYSIS AND DISCUSSIONS

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 histological 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 canalicular 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 non-absorbable sutures are known to provoke scarring either directly or indirectly.
REFERENCES


