External dacryocystorhinostomy for the treatment of acquired partial nasolacrimal obstruction in adults

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Aim: To determine the long term success of external dacryocystorhinostomy (DCR) in adults with acquired partial nasolacrimal obstruction.

Methods: A retrospective study of 50 external dacryocystorhinostomies with silicone intubation performed for partial nasolacrimal obstruction, was undertaken. Preoperative lacrimal scintigraphy divided drainage abnormalities into presac or postsac delays. Postoperative success was determined by lacrimal patency to irrigation, a positive dye test on nasal endoscopy and subjective resolution of epiphora. Statistical analysis was performed using the Fisher exact test.

Results: A patent DCR system to irrigation and a positive dye test was achieved in 90% of procedures. At an average of 3.6 months' follow up, subjective success was reported in 84% of cases—91% for postsac and 67% for presac delays. At 3 years' follow up success had declined to 70% overall and to 80% and 47% for postsac and presac occlusions respectively. There was a statistically significant association between a presac delay and postoperative recurrence of epiphora, $p = 0.04$.

Conclusion: External DCR with silicone intubation is an effective procedure for partial nasolacrimal obstruction. Presac delays do significantly less well and further studies are necessary to evaluate the best type of surgery for these patients.

RESULTS

Fifty lacrimal procedures were performed in 49 patients. Thirteen patients were male and 36 were female. The average age was 62 years, range 21–86 years. The average length of follow up was 36 months, range 11–69 months. Based on the findings at lacrimal scintigraphy, 15 lacrimal systems had a presac delay and 35 systems a postsac delay. The length of follow up was similar in both groups.

Symptomatic outcome

Symptomatic outcomes at an average of 3.6 and 36 months follow up are summarised in Tables 1 and 2. Initial postoperative success was evaluated at the time of silicone tube removal, an average of 3.6 months following surgery, range 3 weeks to 9 months. Patent DCR systems to irrigation and positive dye testing on nasal endoscopy were achieved in 90% of procedures with 84% (n = 42) experiencing complete or very significant reduction in their epiphora. Postsac delays did significantly better with 91% reporting subjective success compared to only 67% of proximal delays. At 3 years' follow up the overall subjective success rate had declined to 70% (n = 35). Again the success rate was higher among postsacs at 80%, and lower for presacs at 47%. There was a statistically significant association between symptomatic success and a postsac scintigram, both at 3.6 months, $p=0.043$, and at 3 years, $p=0.040$. The rate of decline in surgical success was greater as follows: (A) no improvement, tearing is the same or worse, (B) slight improvement, but still tears both indoors and outdoors, (C) significant improvement, but persistent slight tearing outdoors, (D) complete resolution of tearing, both indoors and outdoors. Patients self reporting as A or B were defined as “failures,” C or D as “successes.”
among presacs, with 30% compared to only 12.5% of postsacs experiencing recurrence of epiphora similar to their preoperative status at 3 years’ follow up. However, this did not reach statistical significance.

**DISCUSSION**

External DCR is a highly successful procedure for complete stenosis of the nasolacrimal duct. In contrast, evaluation of its role in the surgical management of patients with functional or partial nasolacrimal system obstruction has been little studied.

From the literature, it appears there are inconsistencies in the terminology employed to describe patients with epiphora whose ducts are patent to syringing. The term “functional obstruction” is confusing as it implies anatomically normal lacrimal passages with a physiological dysfunction. This is clearly not the case as anatomical abnormalities can be identified, either on macrodacryocystography or at exploratory surgery, in the majority of cases. We therefore use the term partial nasolacrimal duct obstruction to describe this group of patients and reserve the term functional obstruction for cases caused exclusively by facial nerve palsy.

Clinically, partial obstruction is implied with a negative primary Jones dye test and a positive secondary dye test. However, there can be significant variability in the primary Jones dye test and PNLO may be more pragmatically defined as epiphora in the presence of a lacrimal drainage system freely patent to syringing with no or minimal reflux and no evidence of lid malposition or lacrimal hyposecretion.

Wearne et al have established the value of scintigraphy in the study of partial obstruction of the nasolacrimal system. They concluded that scintigraphy is more sensitive than DCG in detecting abnormalities in this subgroup of patients. All of our 30 eyes had an abnormal lacrimal scan with either a pre-sac (30%) or a post-sac (70%) blockage. Wearne et al also found a preponderance of post-sac delays, at the sac duct junction or the duct, with the minority, 13%, diagnosed with presac abnormalities. In our experience the main level of blockage caused exclusively by facial nerve palsy.

Presac delays did significantly less well than post-sac delays, p = 0.04. This is not entirely unexpected as the salient pathology in these systems is probably canaliculair in origin. Cases with presac retention are also more likely to have a primarily physiological problem compared to distal delays. Rosenstock et al have shown that physiological dysfunctions are at most always located in the upper system—lids, punctum, and lacrimal pump—and only rarely in the lacrimal sac.

Presac delays achieved superior outcomes, with short term results similar to those achieved following external DCR for complete post-sac stenosis but with, according to both our own and other authors’ results, a greater decline in surgical success over time. Why this should occur in partial compared to complete post-sac stenosis is not clear. After external DCR, the sac and duct should cease to exist and instead become incorporated into the nose, thereby bypassing any distal obstruction, be it partial or complete. It is possible that in cases of acquired PNLO, the idiopathic inflammatory process responsible for the obstruction is ongoing and in a small number, canaliculair inflammation may subsequently occur, thereby predisposing to common canaliculair block, a common cause of DCR failure.

This study shows that in cases of PNLO the differentiation of abnormal scintigrams into presac and post-sac delays provides valuable information in predicting surgical success. The majority of partial post-sac obstructions (80%), a group clearly identified on scintigraphy, achieve successful results following external DCR. Presac obstructions do significantly less well and further studies are necessary to evaluate the best type of surgery in these patients.

**Table 1** Symptomatic outcome following DCR for presac and post-sac PNLO at 3 months (number [%])

<table>
<thead>
<tr>
<th></th>
<th>Presac</th>
<th>Post-sac</th>
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<tbody>
<tr>
<td>Success</td>
<td>10 (66.6)</td>
<td>32 (91.4)</td>
</tr>
<tr>
<td>Failure</td>
<td>5 (33.3)</td>
<td>3 (8.6)</td>
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</tbody>
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**Table 2** Symptomatic outcome following DCR for presac and post-sac PNLO at 3 years (number [%])

<table>
<thead>
<tr>
<th></th>
<th>Presac</th>
<th>Post-sac</th>
</tr>
</thead>
<tbody>
<tr>
<td>Success</td>
<td>7 (46.6)</td>
<td>28 (80.0)</td>
</tr>
<tr>
<td>Failure</td>
<td>8 (53.3)</td>
<td>7 (20.0)</td>
</tr>
</tbody>
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**REFERENCES**