

A Comparison between endonasal and external Dacryocystorhinostomy using the Lac-Q questionnaire

Karl Engelsberg (✉ karl.engelsberg@med.lu.se)

Lund University Clinical Research Centre: Lunds universitet Clinical Research Centre
<https://orcid.org/0000-0001-7951-5709>

Pegah Torabi

Lund University Clinical Research Centre: Lunds universitet Clinical Research Centre

Björn Stenström

Lund University Clinical Research Centre: Lunds universitet Clinical Research Centre

Christer Svensson

Lund universitet

Pernilla Björnberg

Lund University

Anne-Marie Larsson

Lund Univesity

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Abstract

Purpose

Assessing lacrimal problems pre- and postoperatively with a symptom-based questionnaire (Lac-Q questionnaire) and investigating the patients' satisfaction depending on choice of operative technique.

Methods

A total of 112 patients with lacrimal problems operated by external or endonasal dacryocystorhinostomy (DCR) were enrolled in the study. After the operation they received a symptom-based questionnaire (Lac-Q questionnaire) to evaluate their lacrimal symptoms pre- and postoperatively. Complementary questions regarding the scar generated by the operation and satisfaction with the operation were added.

Results

Lacrimal problems gave high scores on the Lac-Q questionnaire. Patients expressed both symptomatic and social problems because of epiphora. Patients were satisfied after DCR surgery and there was no difference between external DCR and endonasal DCR concerning the degree of the patients' satisfaction after the operation. The scar after the operation did bother a few of the patients.

Conclusion

Lacrimal problems were regarded by the patients as a large symptomatic and social burden. The relief of the symptoms and satisfaction after a DCR operation, regardless of endonasal or external approach, were very good.

Introduction

Lacrimal problems are frequently encountered among the ophthalmic patients. There are several etiologies for their epiphora. Common etiologies include dry eye disease and a stop somewhere along the lacrimal system, which prevents the drainage of the tears. One large study has been carried out on the prevalence of lacrimal obstructions in adults, showing that 22% of the population aged over 40 years has uni- or bilateral obstruction [1]. The overall annual incidence of acquired lacrimal duct obstruction (ALDO) has been reported to be 30.47/100 000; nasolacrimal duct obstruction (NLDO) being the most common form of stenosis, with an incidence of 20.2/100 000 [2]. Symptoms from a lacrimal stenosis vary from very mild epiphora to more severe problems with constant epiphora, mucus discharge and chronic dacryocystitis [3]. Interestingly, some patients with a complete distal duct blockage do not have any symptoms from the lacrimal system. The reasons are probably related to that they have a reduced tear production and that the lacrimal sac can absorb a certain volume of tears [4].

Patients with symptoms related to a complete NLDO are usually treated with by-pass surgery in the form of dacryocystorhinostomy (DCR). The goal with DCR is to perform an anastomosis between the lacrimal sac and the nasal mucosa. It can be performed either by an external approach or endonasally. The external approach has long been considered the golden standard, as the outcome has been more favorable for many years, with reported anatomical success rates between 90% and 98% [5, 6, 7]. The success rate for the endonasal approach has steadily improved and is now 89-95% [5, 8]. It is important to be aware that anatomic success is not the same as functional success. As observed in several studies some patients express lacrimal problems even after an anatomically successful DCR-operation [9, 10].

At the end of the day, it is the patients' satisfaction that matters in lacrimal surgery. For this reason, we were interested in the patients' view on their lacrimal problems before and after the DCR operation as well as if there was any difference in satisfaction between patients operated with external DCR or operated by endonasal DCR. To evaluate the impact of lacrimal problems on the quality of life we used a symptom-based questionnaire developed by Mistry et al. called the Lac-Q questionnaire [11]. The Lac-Q questionnaire yields a numerical score that can be used to assess severity of symptoms related to lacrimal problems. The numerical score made it possible to compare the different groups analyzed and a validation of the pre- and postoperatively lacrimal related problems.

Material And Methods

Ethics

The study was approved by the Swedish Ethical Review Authority and comply with the principles of the Declaration of Helsinki. Written consent to participate was obtained from each of the participants. Administrative permission to access clinical data was acquired from Scania Regional Council.

Procedure

The study was performed retrospectively and patients operated with DCR at our clinics during the years 2014-2018 were enrolled. Patients included had preoperatively complained of epiphora and proved to have a ductus stenosis by lacrimal syringing or radiology (dacryocystography). They were offered treatment by either external DCR or endonasal DCR. The patients could freely choose if they wanted to become operated by external or endonasal approach. Exclusions criteria were previous DCR on the same side, congenital obstructions, children (less than 18 years) and previous trauma to the orbit.

Patients operated with external DCR were all operated by the same surgeon (K.E). The operation was performed under general anesthesia according to standard procedure [12]. In summary, a skin incision was made and an ostium was created by removing the lacrimal bone and part of the frontal process of the maxilla. The nasal mucosa was incised, and the lacrimal sac opened. Flaps from the lacrimal sac were sutured to flaps from the nasal mucosa creating an anastomosis from the lacrimal sac into the nose. Silicon tubes were put in place and left for three months.

Patients operated with endonasal DCR were operated by an ENT-doctor (P.B, C.S, A-M.L) together with an ophthalmic surgeon (K.E or B.S). The surgical procedure was performed under general anesthesia and according to previous articles about the procedure [13]. In summary, a luminescent probe was introduced through the canaliculus into the lacrimal sac to see the exact location of the sac with the nasal endoscope. A posterior based flap of nasal mucosa was elevated just anterior to the middle turbinate and exposed the frontal process of the maxilla and lacrimal bone. A diamond DCR burr (Medtronic) was used to create the osteotomy and expose the sac. The canaliculi were then probed and the sac opened while the probe distended the sac, visualized by the endoscope. The lateral nasal wall mucosa was trimmed to cover the superior and inferior exposed bone around the rhinostomy and was reflected back so that it was in apposition with the mucosa of the opened lacrimal sac. Finally, silicon tubes were put in place and left for three months.

Because the Lac-Q questionnaire is in English and we wanted to minimize the risk of misunderstandings by the patients it was translated into Swedish by a translator. Then again translated back into English by another translator to check no information was lost in translation. To further analyze the patients' view of their lacrimal problems and the DCR-operation we added complementary questions according to figure 1. The Lac-Q questionnaire and complementary questions were sent by post to all patients operated at our clinic during the years 2014-2018 and fulfilled the criteria described above.

SPSS (Statistical Package for the Social Sciences) was used for statistical analyses.

Results

There were 112 patients who fulfilled the criteria to be included in the study. 86 of the patients were women and 26 were men. They all received a letter with enclosed questionnaires. Those that did not reply within eight weeks did receive the questionnaire a second time. In total 67 (60%) patients did answer the questionnaires and from these patients were 33 patients operated by external DCR and 34 patients operated by endonasal DCR. Because many patients had bilateral lacrimal problems there were several bilateral DCR operations and for this reason a total of 77 cases of endonasal DCR and 56 cases of external DCR were performed.

The group operated by external DCR had a total Lac-Q score of 469 points before the operation and 148 points after the operation. A reduction of 69%. Their score on social inconvenience was before the operation 143 points and after the operation 48 points, which gives a reduction of 66,4%. The group's degree of satisfaction was 273 points out of 320 points (one patient did not answer the question). Regarding the scar on the side of the nose 4 patients were disturbed. Two of these patients considered the scar ugly and one patient complained of trouble wearing glasses. After the operation the patients stayed home from work for 2-14 days and the median time was 3,5 days. In the group were also many (17) retired people.

The group operated by endonasal DCR had a total Lac-Q score of 441 points before the operation and 98 points after the operation. A reduction of 77,7%. Their score on social inconvenience was before the

operation 147 points and after the operation 37 points, which gives a reduction of 74,8%. The group's degree of satisfaction was 294 points out of 340 points. After the operation the patients stayed at home not working for 0-7 days and the median time was 2 days.

A paired t-test to analyze the social impact by the operation gave an improvement of 2,7 points ($p < 0,001$, 95% CI: 2,3;3,1) in Lac-Q. The reduction of symptoms after the operation was measured by a paired t-test. The result showed a reduction of 5,96 points ($p < 0,001$, 95% CI: 5,05;6,88). The total (both symptoms and social inconvenience) effect on Lac-Q by the operation on all patients was analyzed with a paired t-test. The result showed an average improvement of 9,9 points ($p < 0,001$, 95% CI: 7,424;9,823) in Lac-Q score.

The majority of patients were very satisfied with the operation where 38 patients gave highest (10 point) score and only very few gave less than 6 points. To see if there was any difference in satisfaction depending on external or endonasal DCR had been performed a Mann-Whitney Test was applied and gave a P value of 0,76. The median for both methods was 10 and because of that the P value became insignificant. That means the majority (38 of 66) were as satisfied as was possible. This proved there was no difference in satisfaction between the two operated groups.

A t-test was used to evaluate if there was any difference in satisfaction (social inconvenience and lacrimal symptoms) between the two operating techniques. The average improvement was 0,30 points lower with the endoscopic technique, but, it was not statistically significant ($p = 0,84$, 95% CI: -3,29;2,68). However, both the techniques gave an improvement of 10 points.

Discussion

Many studies have shown an anatomic success of DCR operations ranging from 80-95% [5, 6, 7, 8]. However, there are relatively few studies focused strictly on the patients' view of the operation and the postoperative result [14, 15]. Interestingly, several studies have proved there is a lack of concordance between objective findings and patient satisfaction [16]. For this reason we did in this study focus specifically on the patients' satisfaction. Both external and endonasal DCR proved to give good results concerning improvement in the patients' Lac-Q questionnaire. There was a huge drop on the Lac-Q score after the operation, regardless of which technique used, indicating satisfaction with the operation. As found in the study, the average improvement in Lac-Q score for endoscopic DCR was 9,75 points and 10,05 points for those operated by external DCR. This is only a small difference between the two techniques and when a t-test was done we could see that the difference was not significant. The conclusion to be made is that statistically the operation did alleviate the symptoms in the majority of patients and on the whole the patients were very satisfied. Only one patient did regret being operated.

Epiphora is an important factor in reducing the quality of life [17]. Often thought of as a symptomatic problem epiphora's social impacts should not be neglected. Many of our patients with lacrimal stenosis did not only complain of symptoms of epiphora, but also had problems with their social contacts preoperatively. Both operated groups preoperatively reached high scores (143-147) on Lac-Q concerning

social problems because of epiphora, which is a rather high figure in this setting. However, this is in line with the results by Wong et al. when they used Lac-Q preoperatively in their prospective study. The advantage with a numerical score for social problems by epiphora is the possibility for comparison. Not only comparison preoperatively and postoperatively, but in a prolonged way between lacrimal problems and other diseases. Indeed, we could evaluate the benefit of a DCR operation on the social nuisance with a significant reduction in Lac-Q score postoperatively. Future studies on comparison of the social impact between lacrimal problems and other conditions would be of interest.

In the complementary questions was asked if the scar did bother the patients and it was interesting to find 4 patients described problems. In choosing between the different operating techniques all patients were informed about the scar if they choose to be operated by the external DCR technique. Everyone had the possibility to choose to be operated with the endoscopic DCR technique to avoid the scar. One can speculate that in the initial setting the lacrimal problems overshadowed the consequence of having a scar, but when the lacrimal problems resided the scar became an issue. That is something to take into consideration when choosing which technique to address the patient's lacrimal problems.

Because the study was done retrospectively, for some patients a couple of years after their operation, there is a risk their answers were affected by the time factor letting them look more optimistic on their preoperative symptoms. There is of course also the opposite risk that they exaggerated their preoperative symptoms. However, we do believe there is a point in doing the study retrospectively as the patients by then could reflect on their previous symptoms and compare to the postoperative result.

One of several factors in the choice of operation is how long time the patient needs to stay at home after the operation before being able to return to work. After a DCR operation it is well known that a couple of days at home is to be recommended, but to our best knowledge we could not find any study on how many days people actually stay at home after operation. On average the patients stayed home one day less after operated by endonasal approach in comparison with those operated by external DCR. On the whole, the majority of patients recovered quickly and after a few days break they were back at work. This study could confirm that our recommendations for postoperative rest are in line with the actual situation experienced by the patients.

To conclude, both the external DCR and endonasal DCR gave good symptomatic relief for the majority of patients and there were no difference in satisfaction between the two groups. The social nuisance of lacrimal problems is important for the patients and can be effectively alleviated by a DCR operation.

Declarations

Ethics approval and consent to participate: The study was approved by the Swedish Ethical Review Authority and comply with the principles of the Declaration of Helsinki. Written consent to participate was obtained from each of the participants.

Consent to publish: Everyone who participated gave consent to publish.

Availability of data: Administrative permission to access clinical data was acquired from Scania Regional Council. Data were also sent from the patients as an answer on the questionnaire sent to them.

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Authors' contribution: K.E. and P.T. wrote the initial manuscript. K.E., B.S., P.B., C.S. and A.L. did the surgery and follow up of the patients. Everyone did read the initial manuscript and made improvements to it.

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Figures

Complementary questions:

1. On the whole, are you satisfied with the operation?

Answer on a scale from 1-10 (1=not at all satisfied; 10=very satisfied)

2. Do you regret the operation?

Yes No

3. Do you feel well from the lacrimal apparatus?

Yes No

If no -why?

4. Does the scar (external DCR) on the nose bother you?

Yes No

If yes -in what way?

5. If you work: how long did you stay at home after the operation?

Figure 1

Complementary questions sent to the patients.