

Local anaesthetic endonasal endoscopic laser dacryocystorhinostomy: analysis of patients' acceptability and various factors affecting the success of this procedure

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Abstract

Background and Objectives Endonasal endoscopic laser dacryocystorhinostomy is now a well established, effective approach to relieve nasolacrimal duct obstruction.

Whereas attempts have been made to comment on the efficacy of the procedure, no study has been conducted to evaluate the acceptability of this procedure by those at the receiving end, ie, the patients. An attempt has been made in the present study to critically evaluate the procedure from the point of view of patients' acceptability and also to evaluate certain factors which may influence the success rate of this procedure.

Patients and Methods Forty-six eyes from 40 patients underwent endonasal endoscopic laser dacryocystorhinostomy, performed by the same surgeon, over a period of 15 months. Various aspects of the procedure were evaluated by patients by filling out a simple questionnaire (Figure 1). In addition to recording patients' views, success of the procedure was confirmed by performing a postoperative sac washout in the clinic. Patients were also subdivided according to their age, duration of symptoms and history of previous surgical intervention. The data were statistically analysed using chi-square tests with the Yates correction.

Results The percentage of patients who declared themselves completely cured was 65.22%. A partial resolution was felt by 23.91% of patients and no improvement was reported by 10.87% of patients. Forty-two out

of the 46 eyes (91.3%) achieved anatomical success by the procedure, as shown by a postoperative sac washout performed in the clinic. Some of them, however, did not have complete resolution of their symptoms perhaps due to an additional factor of lacrimal pump dysfunction in these patients. During the procedure 60.86% of eyes felt no discomfort at all whereas 39.14% of eyes felt some discomfort at some point of time during the procedure (Table 1). When directly asked 86.12% of patients recommended the procedure (implying that the procedure had some good effect on their quality of life), 8.33% of patients did not recommend it and 5.55% of patients made no comments. Various factors affecting the success of this procedure were analysed (Table 2) and it was found that eyes which had no previous surgical intervention showed a complete cure rate which was significantly higher than that seen in eyes which had some sort of previous intervention ($P = 0.0003$); eyes with a short (<6 mths) duration of symptoms showed significantly higher success rates ($P = 0.0098$) in comparison to that shown by eyes with longer (>6 mths) duration of symptoms; and younger patients (<50 yrs) had a complete resolution rate much higher than patients over 50 yrs of age ($P = 0.0309$).

Conclusion The present study clearly shows that endonasal endoscopic laser DCR is an effective procedure, well tolerated and recommended by the patients. Discomfort during the procedure is not a major problem.

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Younger patients, with no previous surgical intervention and with short duration of symptoms are likely to be benefited the most. Though success rates are higher with external DCR, endonasal endoscopic laser DCR offers certain advantages over the external approach while keeping the option of external DCR open, if needed at a later date.

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Introduction

Dacryocystorhinostomy is performed to directly connect the lacrimal sac to the nasal cavity in order to bypass a lacrimal sac or nasolacrimal duct obstruction. It can be performed via a conventional external route or via an endonasal approach with or without laser, under direct vision or endoscopically. Whereas attempts have been made to comment on the advantages and disadvantages of one method over the other, no attempt has been made so far to analyse the

1. For how long did you have watering from the eye(s) before surgery
 - a) 3 to 6 months
 - b) 6 months to 1 year
 - c) more than a year
2. Did you feel any discomfort during the operation? yes/no.
If yes was it
 - (a) while giving the injection of local anaesthetic
 - (b) during the Laser treatment
 - (c) while inserting the tubes at the end of operation
3. What is the result of operation?
 - a) cured of watering
 - b) not cured but significant improvement
 - c) mild improvement
 - d) no improvement at all.
4. Would you
 - (a) opt for this operation in your other eye if you had similar complaints
 - (b) have this operation again if it failed once
 - (c) recommend this operation to any other patient

Figure 1 Questionnaire filled in by the patients.

patients' acceptability of the different approaches. In the present study, we have critically evaluated the success of local anaesthetic endonasal endoscopic laser dacryocystorhinostomy from patients' point of view of acceptability. In addition, we have also analysed the effects of certain factors which may influence the success of this procedure. To the best of our knowledge, this is the first attempt of this kind and will go a long way in deciding the future prospects for such a surgery.

Patients and methods

Forty-six eyes from 40 patients who underwent endonasal endoscopic laser dacryocystorhinostomy over a period of 15 months were selected for this study. All the patients underwent sac washout which revealed blockage distal to the lacrimal sac. Mean age at the time of surgery was 66.5 years. Mean follow-up period was 12 months. Endonasal endoscopic dacryocystorhinostomy with insertion of O'Donoghue tubing was performed under local anaesthesia, using a Holmium:Yag laser. Cocaine spray with adrenaline was used for anaesthesia of the nasal mucosa and 2% xylocaine with adrenaline was infiltrated into the lacrimal sac region. The laser settings used were 0.6–0.8 Joules/Hz (equivalent of 6–8 watts) for mucosal application and 1.0 Joules/Hz (equivalent of 10 watts) for application to bone. All the patients were followed up for at least 12 months. Various aspects of the procedure were evaluated by patients by filling out a simple questionnaire. To analyse the effect of various factors on the outcome of the surgical result, patients were also subdivided on the basis of duration of symptoms, age and history of previous surgical intervention. The data were statistically analysed using chi-square test with Yates's correction.

Results

During the procedure 60.86% of patients felt no discomfort at all whereas 39.14% of the patients felt some discomfort at some stage during the procedure (27.77% during injection of local anaesthetic, 16.67% during laser application and 55.56% during insertion and retrieval of the tubes) (Table 1). When directly asked, 86.12% of patients recommended the procedure (implying that the improvement in their symptoms did have some positive effect on their quality of life), 8.33% of patients did not recommend it and 5.55% of patients made no comments. The percentage of patients who declared themselves completely cured was 65.22%. A partial resolution was seen in 23.91% of patients whereas no improvement was felt by 10.87%

Table 1 Events associated with discomfort

Patient's comfort	Total	During local anaesthetic	During laser application	During insertion of tubes
No discomfort	28 (60.87%)	–	–	–
Some discomfort	18 (39.13%)	5 (10.87%)	3 (6.52%)	10 (21.74%)

of patients. Anatomical success was achieved in 91.3% of patients. In this study, 63.04% of eyes had no previous lacrimal drainage procedure and in this group 86.21% had a complete resolution of symptoms, in comparison to 29.41% complete cure rate achieved by the patients who had a previous surgical intervention. This difference was found to be statistically significant (P value = 0.0003). There were a range of procedures which these patients had prior to laser DCR, eg, lid malpositioning (entropion/ectropion) surgeries (eight patients), nasal surgery (removal of polyp, correction of deviated nasal septum (five patients) and endonasal dacryocystorhinostomy without laser (four patients). Eyes with short (<6 mths) duration of complaints attained a complete cure rate of 89.47% in comparison to 48.15% complete cure rate achieved by eyes with longer (>6 mths) duration of symptoms. This difference was also found to be statistically significant (P value = 0.0098). The patients younger than 50 years showed higher success than those over 50 years and this difference was also statistically significant (P value = 0.0309). All these results are shown in Table 2.

Discussion

Dacryocystorhinostomy (DCR) is a surgical procedure which is performed to directly connect the lacrimal sac to the nasal cavity in order to bypass a lacrimal sac or

nasolacrimal duct obstruction. The procedure can be carried out via an external or intranasal route, the former described originally by Toti in 1904¹ and the latter by Caldwell in 1893.²

Whereas the external approach seems to provide superior operation results in primary acquired nasolacrimal duct obstruction,³ the internal approach offers various advantages such as minimal tissue injury, lack of cutaneous scar, excellent haemostasis, minimal operative and postoperative morbidity, shorter surgery time and no interference with lacrimal pump function.^{4,5} In the past the intranasal route, however, lost its popularity in spite of above-mentioned advantages perhaps because of difficulty in obtaining adequate visualisation of the operation site during the intranasal approach with the then conventional technology. With the advent of fibre optic technology which ensures excellent visualisation, there is revival of interest in the intranasal dacryocystorhinostomy.

Endonasal laser DCRs have been described using high energy argon, carbon dioxide or potassium titanyl phosphate and holmium lasers with visualisation provided by the operative microscope or video endoscope.^{4,6} We describe the use of a continuous wave coherent Holmium: YAG laser under endoscopic control in 46 eyes followed up over 15 months and suggest that it is a technique that is easy to perform, has good success rate and patients' acceptability.

Among the most common reasons for failure of external DCRs are membranous occlusion of the ostium by synechiae between the surgical ostium and the adjacent nasal septum or middle turbinate, blockage of the ostium by the middle turbinate or deviated nasal septum or granuloma formation within the ostium.⁷ The ostium produced by the laser is smaller than that formed during conventional DCR, but it has been shown that despite the resection of large amounts of bone (up to 20 mm in diameter) the diameter of the ostium in these cases decreases to an

Table 2 Factors identified to affect success of endonasal endoscopic laser DCR

Patients' group	Total	Completely cured	Partially cured	No cure	Yates corrected χ^2 and P value
Duration of symptoms					
<6 months	19	17	2	–	Corrected χ^2 = 6.673026 P value = 0.0098
>6 months	27	13	9	5	
Past history					
No previous surgical intervention	29	25	4	–	Corrected χ^2 = 12.83914 P value = 0.0003
Previous surgical intervention	17	5	7	5	
Patient's age					
<50 years	20	17	3	–	Corrected χ^2 = 4.659159 P value = 0.0309
>50 years	26	13	8	5	

average of 1.80 mm.⁵ A small ostium has the advantage of reducing the mobility of the tubes perhaps leading to less risk of extrusion of these tubes before normal removal time. The importance of adequate tube retention for a successful outcome has been shown by Boush *et al.*⁷ Sadiq *et al.* reported a short-term success rate of 67% with endonasal laser dacryocystorhinostomy and felt that some adjunctive treatment was required to improve the maintenance of the nasal mucosal ostium for longer lasting success.⁸ Weidenbecher *et al.* reported a high overall success rate of 95% in their 56 patients but the follow-up period for these patients was not specified.⁹ Metson *et al.* reported success in 85% of their patients.¹⁰ In all these studies patients' views were not taken into consideration while quoting the success rates of the procedure. Moreover, no one has looked into what was the subjective experience of these patients during and after surgery. We looked into all these aspects and observed the following facts in our study. Twenty-eight patients (60.87%) felt no discomfort at all during the procedure. Eighteen patients (39.13%) complained of some discomfort at some point of time during the procedure: five patients (10.87%) during injection of local anaesthetic, three patients (6.52%) during laser application and 10 patients (21.74%) during insertion of tubes. In the postoperative period eight patients (17.39%) had extrusion of tubes and needed repositioning of the tubes. The overall clinical success rate in our series was 89.13%, with 65.22% of patients declaring themselves completely cured and 23.91% of them reporting a partial but significant improvement in their symptoms. Anatomical success was achieved in 91.3% of patients. Our results of a total cure rate of 65.22% compare favourably with those reported by Hartikainen *et al.*³ (63%), Sadiq *et al.*⁸ (67%), Boush *et al.*⁷ (70%) and Reifler *et al.*¹¹ (68.4%). If we include patients with partial cure as well, the success rate reaches nearly 90%. Though some authors feel that the lacrimal sac cannot be explored satisfactorily by the endonasal approach and lacrimal stones may not be detected, we have not experienced this as a problem, an opinion shared by Hartikainen *et al.*³

In spite of a small sample size, our study clearly shows that endonasal endoscopic laser dacryocystorhinostomy, performed under local anaesthesia, is an effective procedure, well accepted and tolerated by the patients. The success rate is higher in patients with shorter duration of symptoms, without any prior surgical intervention, and younger patients

do better after surgery. Discomfort during the procedure is not a major concern for the majority of patients, with 86% saying they would recommend the procedure to someone else. As the success rate is significantly higher in the younger patients with shorter duration of epiphora and without previous surgical intervention, we recommend that this procedure should be undertaken as a primary procedure at an early stage.

It must be said, however, that external DCR remains the gold standard against which other methods will continue to be compared.³ Though laser DCR is less successful than external DCR (success rates >80%), it offers certain advantages which make this procedure one of the viable and good options with obstructive epiphora. We believe that relieving symptoms of these patients has some positive effect on the quality of life they lead.

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