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A comparative study of external dacryocystorhinostomy to recanalize the nasolacrimal duct with endonasal approach

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Abstract

Aim: To evaluate the comparison of efficacy and adverse effects between endonasal and external dacryocystorhinostomy(DCR).
Materials and Methods: Prospective, interventional, comparative study for 76 patients of symptomatic non-traumatic naso-lacrimal duct obstruction. Patients with previously failed surgery were excluded. 36 patients underwent recanalization with endonasal approach using endoscope (0, 30 and 70 degree) equipped by video endoscopy for direct visualization on monitor and 40 patients underwent external dacryocystorhinostomy. Follow up done on day 1, 7, 21, 3 months, 6 months and one year post-operatively. Evaluation was done on the basis of symptomatic relief and patency of nasolacrimal duct on lacrimal syringing. Data was analyzed by chi square test and unpaired t- test. P value <0.05 was considered statistically significant.
Results: Success defined as an asymptomatic patient or freely patent syringing at the end of one year of follow up was 82.50% (33 patients) in external DCR group and 80.56% (27 patients) in endonasal DCR group. Success was comparable in both the groups (p>0.05). Surgical time was significantly less in endonasal DCR than in external DCR (p<0.001). Rehabilitation was rapid in endonasal group and was considered statistically significant (p value<0.05). External DCR group had 5 cases having hemorrhage requiring intervention, 4 wound dehiscence and two got infected post operatively, these complications were reduced in endonasal DCR group. However the success rate in these patients was comparable to the others within the group (p>0.05).
Conclusion: External DCR surgery is regarded as the gold standard in treatment of nasolacrimal duct obstruction. Endonasal DCR surgery had success rate comparable to external DCR surgery. Surgical time was significantly less and rehabilitation was significantly fast in endonasal DCR surgery. Endonasal DCR surgery is a good option for external DCR surgery as it is cosmetically better, takes less surgical time and has fast rehabilitation.

Keyword: Endoscope, Nasolacrimal duct obstruction, Recanalization

Introduction

Nasolacrimal duct obstruction (NLDO) resulting in symptomatic dacryocystitis is a common problem in female population of lower socio-economic strata. External dacryocystorhinostomy (DCR) is an established gold standard treatment since 1904 when it was first reported. Recently there have been several innovations in its management with introduction of endonasal approach, endocanalicular endolaser DCR, ballooning and stenting. These approaches require specialist training and equipments often a limitation in developing countries. More over there are uniform reports of these methods being inferior to the gold standard in terms of success rates. Also all these techniques aim at creating an alternate channel for tear flow rather than restoring the physiological drainage pathway.

Endonasal approach has been used in the last few decades for DCR with varying degrees of success.

Material and Methods

A total of 76 patients of symptomatic NLDO were enrolled for the study in department of ophthalmology, BRD medical college, Gorakhpur from 2012 to 2015. Proper consent were taken from all the patients. All patients had a symptomatic epiphora of more than one year duration with NLDO which was confirmed by syringing. Necessary clearance was granted from the ethical committee of our institute. Patients with history of trauma, canalicular blocks and hypertrophic turbinate and polyp were excluded. We also excluded previously failed dacryocystorhinostomy and children below the age of 03years. 36 patients underwent endonasal DCR and 40 patients underwent standard external DCR. All surgeries were performed by the same surgeon with random allocation of eyes to either endonasal or external DCR group. The mean age of patients was 40 years (range 5 to 71) years and the female to male ratio was 5.33:1. Follow up period was 6 months (range 3 to 12months). All patients were followed up for a minimum of 12 months after surgery.

The 0, 30 and 70 degree endoscope was used with videoendoscopy to see the magnified view on the monitor directly, with the advantage of recording the procedure simultaneously.

For the endonasal approach the conjunctival sac and the inferior meatus were anesthetized by small gauge soaked in 2% lidocine hydrochloride with 1:200000 adrenaline solutions. Local anaesthesia via infiltration was given as well. Punctal dilatation was performed with nettle ships punctal dilator if required. Dye (methylene blue) was passed through lacrimal puncta into the lacrimal sac through canaliculi and viewed from within the nasal cavity with an endoscope.

Mucosa over the frontal process of maxilla is stripped, and a part of nasal process of maxilla is removed making an ostium of about 8 mm. lacrimal sac is opened by breaking the lacrimal bone. Thus the blocked nasolacrimal duct is by passed in the drainage of tears.

External DCR was performed by the standard technique.

All patients received topical antibiotic steroid drops and nasal astringent drops thrice a day for three weeks. Patients were followed up at 1 week, 1 month, 3 months, 6 months, 1 year post operatively. Symptoms were assessed at each follow up. Syringing with distilled water was performed at each visit.

Success was defined as an aymptomatic patient or a freely patent syringing at last follow up. A symptomatic patient with regurgitation on syringing considered as failure.

Data was analyzed by chi square test and unpaired t test. $P<0.05$ was considered statistically significant.

Results

Last follow up of each patient was considered for analysis. The out-comes are summarized in Table1 and 2.

Table 1

Surgical results	External DCR (%)Group I	Endonasal DCR (%) Group II	Total (%)	Significance
Syringing day 1	27 (67.5%)	27 (75%)	54 (71.05%)	$x^2 = 0.170$ D.F. = 3 Non-Significant
Syringing day 7	32 (80%)	32 (88.89%)	64 (84.21%)	
Syringing day 21	30 (75%)	29 (80.56%)	29 (80.56%)	
Syringing 3rd month	33 (82.5%)	29 (80.56%)	62 (80.58%)	

Success rate was comparable in both the group. 29 patients out of 36 were patent after 3 months of postoperative evaluation in the endonasal group, 7 patients continued to be symptomatic and were regarded as failures. Similarly 7 patients were reported as failures in the external dcr group out of 40 patients.

Table 2

Outcomes	External DCR Group I	Endonasal DCR Group II	Total	Significance
Haemorrhage requiring intervention	5	3	8	$x^2 = 0.446$ D.F. = 3 Non-Significant
Infection	2	1	3	
Wound dehiscence	4	1	5	
Total	11	5	16	
% sec outcomes	11/40 (27.5%)	5/36 (13.88%)	16/76 (21.05%)	

Discussion

Treatment of symptomatic chronic dacryocystitis has always been low in priority for the general ophthalmologist primarily because of prolonged surgical time, patient discomfort, and complications associated with conventional DCR procedure. Several of these issues have been addressed by the endonasal DCR approach with added problems of increased infrastructure as the endoscopes is to be used exclusively for the said procedure.

The outcomes of endonasal approach is significantly better than external DCR technique. We understand two main reasons for the same. Firstly, it is cosmetically much better and has fast rehabilitation than the external DCR. Secondly, our criteria for success consider anatomical patency only. The success rates are comparable with decreased mean surgical time. An anatomical patency confirmed on syringing (with persistent watering), probably points towards more than one reasons for epiphora. However this does not reduce the importance of a successful anatomical patency by a minimally invasive outpatient department (OPD) procedure in patients with definite anatomical block of nasolacrimal duct. Studies describing anatomical patency have comparable results.

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