

# A U-SHAPED MUCOSAL INCISION OUTCOME VERSUS H-SHAPED IN THE EXTERNAL DACRYOCYSTORRHINOSTOMY PROCEDURE

Abdulrahman Hama Amin Hussein <sup>a</sup>, Sakar Abdulkarim Nidhamalddin <sup>b</sup>,  
and Sanoor Qader Mahmood <sup>b</sup>



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## ABSTRACT

### *Background*

Despite the long-time passed since the beginning of using dacryocystorhinostomy (DCR) for the treatment of nasolacrimal duct obstruction, it still has the highest success rate among the other surgical procedures used for the treatment of the same condition that is why it is still widely accepted and used procedure.

### *Objectives*

To evaluate the outcome of External-DCR by using manipulated surgical technique in creating anterior flap without posterior flap.

### *Patients and Methods*

A retrospective review of patients who underwent External DCR between Sep. 2012 to Feb. 2014 at Shahid Dr. Aso Teaching Eye hospital in Sulaimani city which was performed by a single surgeon. The data of 65 patients were analyzed, all with the chief complaint of watering eye and mucocele. A U-shaped manner mucosal incision was done to create enough size anterior flap without posterior flap, after follow-up of about two years, postoperative success was defined objectively by irrigation of the puncta without regurgitation and subjectively by patient satisfaction with the absence of epiphora or mucocele. Ethical consideration of the risks and benefits of the procedure was observed for each individual patient.

### *Results*

A 69 External-DCR were performed on 65 patients, of which 53 were female and 12 were males between the age of 17 and 64, all with the complaint of watering eye and mucocele. After follow up period of two years the overall success rate was 96.9%. Each individual factor like age, sex, IOP and presence of other ocular conditions were assessed against the outcome in all of them, the correlation was not significant (value > 0.05) in all instances. That makes the procedure employed the sole factor in this high success rate of the outcome.

### *Conclusion*

Creating only anterior anastomosis is technically simpler, easier, less time consuming and does not negatively influence the outcome of External-DCR surgery, this procedure demonstrates higher success rate comparable to that of the conventional method in the literature, so we conclude that the procedure can be implemented as a standard technique for external DCR.

**Keywords:** *External DCR, Anterior flap, Mucocele.*

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<sup>a</sup> Shahid Dr. Aso Teaching Eye Hospital.  
Correspondence: [drabdulrahman02@gmail.com](mailto:drabdulrahman02@gmail.com)

<sup>b</sup> Shahid Dr. Aso Teaching Eye Hospital.

## INTRODUCTION

Nasolacrimal duct obstruction (NLDO) is the obstruction of nasolacrimal duct and included two types either congenital or acquired. Obstruction of the nasolacrimal duct is the cause of the excess overflow of tears called Epiphora <sup>(1)</sup>. A disorder of the tear drainage is either functional or it is due to anatomical abnormalities. In terms of functional disorder, pumping dysfunction is the problem, which may be due to poor function of lacrimal punctum, eyelid laxity or orbicularis muscle weakness or facial nerve palsy. In the anatomic blockage, congenital or acquired disorders can occur at any point along the lacrimal drainage. Congenital blockage of the lacrimal drainage system, usually occur by Hasner membrane valve, which covers the end of the nasolacrimal duct. Acquired blockage is due to naso-orbital trauma, chronic sinusitis, lacrimal sac neoplasms, dacryocystitis, and evolutionary stenosis <sup>(2)</sup>. In both kinds of disorder, excessive tearing is the main complaint of patients with NLDO and pain at the side of the nose suggests dacryocystitis.

NLDO lead to watery eye, persistent mucocele and recurrent attack of dacryocystitis. Recurring of them despite medication can be surgically treated.

Surgical treatment is dacryocystorhinostomy DCR, there are different techniques of performing DCR operation, despite satisfactory results reported with several techniques such as nasolacrimal duct intubation <sup>(3)</sup>, endoscopic <sup>(4)</sup> or non-endoscopic DCR <sup>(5)</sup>, endonasal or transcanalicular laser DCR <sup>(6)</sup>, and external DCR remains the method of choice for most oculoplastic surgeons <sup>(7)</sup> and widely acceptable which is creating anastomosis between lacrimal sac mucosa and nasal mucosa after removing the intervening bone and this was credited by Toti in 1904 <sup>(8)</sup> and the operation was undergone in 1920-1921 <sup>(9)</sup> by Dupuy-Dutemps and since now only minor modifications done and the success rate is range from 75%-99%.

Although double flap DCR is the toughest anastomosis, it produces excellent results with skilled expert hands but still anastomosis of anterior flap only without posterior flap is not disadvantageous to the outcomes of EDCR. We believe that this simplified procedure can be implemented as the standard technique for EDCR.

## PATIENTS AND METHODS

A retrospective study, 69 eyes of 65 documented cases of watering eye who have been operated upon between Sep 2012 to Feb 2014. Thorough history was taken and documented at the time. All patients' complained from

watering eye and mucocele. Each patient preoperative assessment included standard ocular examination like visual acuity, biomicroscopic anterior segment and fundus examination, to confirm the obstruction of nasolacrimal duct Irrigation. All patients had ENT consultation to detect any nasal pathology like nasal septal deviation, nasal polyps, sinusitis...ect. All patients were operated by the same surgeon, the procedure carried out under general anesthesia after consulting the anesthetics that advised the patients to stop Aspirin tablet for one week before the surgery for those who were taking Aspirin, hypotensive technique asked.

Topical anesthetics with decongestant was routinely applied to the nasal mucosa, in and around the area of lacrimal sac lignocaine 2% with diluted adrenalin was injected.

A vertical incision of 10 mm above medial canthal ligament was made with a blunt tipped scissor, the orbicularis fibers separated and medial palpebral ligament exposed and separated from its attachment to the anterior lacrimal crest, the periosteum was incised and elevated from the whole lacrimal fossa. An osteotomy 2x2 cm at the lacrimo maxillary bone made, then nasal mucosa Exposed. A U-shaped incision was made to create the anterior flap. Then by passing two lacrimal probes through upper and lower canaliculi to locate the sac which then opened by using no. 11 blade. All patients were intubated with silicone, an anastomosis made between nasal mucosa and the lacrimal sac by suturing with avicryl 6/0. The skin was closed with 6.0 black silk, a light bandage was put on the wound, nasal pack with antibiotic ointment placed at the end of the surgery.

Follow up of the patients was done first day after the surgery where dressing of the wound performed, the nasal pack removed, systemic antibiotics given with topical steroid and antibiotic. The patients were seen one week postoperatively, and the skin sutures were taken out. Then after 4-6 months they were followed up, the silicon tube removed. Then follow up continued after one year and two years to check the success of the operation either by irrigation or asking for patient satisfaction.

Ethical consideration was regulated by Ministry of Health and observed during operation and research. Informed consent after clarification of the procedure and its outcome and risks was taken from the patients. On subsequent visits of the patients the results were documented and analyzed using statistical software

for social science SPSS 20. Correlation between categorical and continues data was made using chi square and ANOVA test.

**RESULTS**

The study includes 69 eyes of 65 patients, the mean age was 39.29 years ranged from 17-64 years, there were 53(81.5%) females and 12 (18.5%) males, in terms of jobs 45(69.2%) were unemployed,14 (21.5%) were employed and 6 (9.2%) student,Table 1.

Regarding residency, 43 (66.2%) were living in rural areas and the rest 22 (33.8%) in urban areas.

Regarding bilaterality, 34 (52.3%)of cases had obstruction in the Rt side, 27 (41.5%) in the Lt side, only 4 (6.2%) had obstruction in both side. 10 (15.4%) had nasoseptal deviation to Rt, and 12 (18.5%) to Lt and the rest had no deviation. 46 (70.8%) cases had no any other ocular disease, 9 (13.8%) had cataract,7 (10.8%) had refractive error, and only 3 (4.6%) cases had ptrygium.

Review of complications demonstrates, that there were 13 (20.0%) intraoperative hemorrhage case more than 100 cc where the rest 52 (80.0 %) had less which stopped, 10 (15%) cases had scars in the shape of epicanthus fold, and only 4(6.2%) cases had mild infection which controlled by medications. There were no cases of orbital emphysema, cerebrospinal leakage or sever infections.

After follow-up of two years at the last examination only 2 (3.1%) patients had persistent epiphora when using syringing the naso lacrimal apparatus were blocked (failed DCR), they were one male and one female. The overall success rate of the surgical procedure used in this study was 96.9% of the 65 patients and 97.1% of 69 eyes.

By using chi square test to find correlation between different factors that may affect the outcome the result was not significant at the statistical level of 0.05.

**Table 1. The result of the operation and gender distribution.**

Result	Gender		Total
	Male	Female	
Failure	1	1	2
Success	11	52	63
Total	12	53	65

**Table 2. Residency of the Participants.**

Residency	Frequency	Percent
Rural	43	66.2
Urban	22	33.8
Total	65	100.0

**DISCUSSION**

In this study (81.5%) of patients were female and (18.5%) were male, the same gender rate can be found the most studies <sup>(10-11)</sup> as the majority of patients with epiphora are females, this may be due to smaller nasolacrimal canal diameter in females than in male and hormonal factors <sup>(12)</sup>. The mean age was 39.29 years which is considered as premenopausal age <sup>(13, 14)</sup>. Most of the obstruction was in Rt eye (52.3%) more than Lt eye (41.5%) and lowest number had two-sided involvement (6.2%) respectively <sup>(15)</sup>. The study concludes that most of the

patients were female and came from rural areas and with lower income groups and this may relate to their life style for example cooking and working in farms in which they were in contact with smoke, dust, pollen, agricultural pesticides, etc. Because these factors may have roles in causing infection and inflammation and may cause duct obstruction <sup>(16, 17)</sup>.

The surgical outcome of single flap DCR in this study showed minimal complications. Persistent epiphora or failure DCR is documented in only two cases. The success rate is comparable with best results reported in

previous studies using different flap design<sup>(18)</sup>. It has been widely suggested that creation and suturing of both flaps increase the possibility of primary healing of the new tract and reduce the mucosal scarring and appears to better achieve this goal. On the other hand, suturing the posterior flap often constitutes a difficulties and may take considerable amount of time particularly in the presence of hemorrhage in DCR surgery. The posterior flap can be anastomosed, excised or not fashioned at all.

The result of the current study is comparable to several studies conducted for the same purpose, for instance Gazmend Kaçaniku and Etal from the University Clinical Center of Kosovo, conducted a research included 15 males and 37 females, had a success rate of about 96.2 % which is way more than the External-DCR technique. In addition, the rate of complication recorded was low<sup>(19)</sup>.

In another study on Sudanes patients by Kemmal Hashim Benawi and Etal, the success rate for this novel procedure was 98% in 200 patients who had U-Shaped DCR technique. There was no case of orbital emphysema, cerebrospinal fluid (CSF) leakage or wound sepsis in the follow up period. In general, the rate of complication was less the with External-DCR<sup>(20)</sup>.

In the current study only anterior single flap is sutured to the lacrimal sac and to the margin of periosteum at the anterior lacrimal crest. The U-shaped configuration of the created flap allows easier suturing of the sac and the mucosa. Although it is simpler and easier to master the surgical technique, anterior single flap DCR demonstrate success rate comparable to that obtained by the more complex conventional DCR, this gives this procedure an advantage over the conventional one. However, a randomized trial is needed to statistically compare between the two procedures and validate this conclusion.

As the p value in the finding correlation between different factors like, presence of other eye problem, presence of different symptoms revealed no significance as the p value in all instance were more than 0.05, it can be concluded that the sole factor in this high success rate can be contributed to the procedure adopted.

The patients' compliance is considered one of the problems in conducting any research as they do not follow the specific schedule for visits, probably larger number of participants may be necessary over period of

several years to precise estimation of the safety of this new procedure.

In conclusion, in general, U-shaped DCR is superior to H-shaped DCR in term of safety and patients' comfort. Creating only anterior anastomosis is technically simpler, easier, less time consuming and does not negatively influence the outcome of External-DCR surgery, this procedure demonstrates higher success rate comparable to that of the conventional method in the literature, so we conclude that the procedure can be implemented as a standard technique for external DCR.

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