

## External Dacryocystorhinostomy Surgery at Biratnagar Eye Hospital, Nepal

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### ABSTRACT

**Introduction:** Nasolacrimal duct obstruction at the junction of the lacrimal sac and nasolacrimal duct causes acute or chronic dacryocystitis. Dacryocystorhinostomy (DCR) is the treatment of choice and has a high success rate.

**Objective:** To analyze the success rate of external DCR surgery and its influencing factors at our hospital.

**Methods:** It is a hospital based descriptive study of cases that underwent external DCR surgery from June 2016 to February 2017 at Biratnagar eye hospital. The demographic data were recorded and the successful outcome of the surgery along with its influencing factors -tube status, operating surgeons and gender were analyzed. The main outcome measure was defined as a patent lacrimal passage on syringing at 6 months postoperatively. Chi-square and Fisher's exact test were used for statistical analysis.

**Results:** In total 317 patients, the mean age of the patients was 38.46 (SD ± 13.6) years. The male to female ratio was 1:2.5. The commonest presenting symptom was watering with discharge in 224 (70.6%) patients. Of the total, 195(61.5%) had undergone the DCR surgery with intubation and 122 (38.5%) without intubation. Only 114 (35.9%) patients were followed up to 6 months. The success rate was 86.8%. Postoperative wound infection, bleeding or cheese wiring of the punctum were not seen. No statistically significant factors were seen to influence the success rate of DCR surgery.

**Conclusions:** External DCR surgery has a high success rate and no significant influencing factors were found to define its success in this study.

**Keywords:** External dacryocystorhinostomy; nasolacrimal duct obstruction; surgical success.

### INTRODUCTION

Nasolacrimal duct obstruction is the most common disease entity in our oculoplasty department. Treatment of choices may vary from external dacryocystorhinostomy surgery (DCR), endonasal endoscopic/non-endoscopic DCR surgery and laser-assisted dacryocystorhinostomy surgery. In all of

these methods, an anastomosis between the lacrimal sac and the nasal cavity is created through a bony ostium. External DCR surgery is considered to be the gold standard.

Success rate of external DCR in literature ranges between 80%-95%.<sup>1</sup> Scar formations over the incision, infection, ectropion, or disruption of the medial canthal ligament and epistaxis are the some of the reported complications. Studies have shown that the difference in success rate depends on various factors like surgical technique, patient selection, demographics, definitions of success, etiology of nasolacrimal dysfunction and learning curve for external DCR. The external DCR surgery can be

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performed under general anesthesia or under local anesthesia with or without sedation. Ipsilateral nasal packing is done to minimize intra-operative and post-operative hemorrhage.

DCR is the most common surgery done at our hospital in the oculoplasty department. Due to cost effectiveness, surgery under local anesthesia and higher success rate it is still the choice of surgery. It is done by general ophthalmologists, oculoplastic surgeons, fellows and residents. The number of follow ups, postoperative complications and success rate of external DCR are not known in our patients.

So this study was carried out to find out the follow up rate of patients with external DCR surgery at our hospital with their success rate and probable influencing factors.

## METHODS

It is a hospital based descriptive study. Data of all the patients who underwent external DCR and whose files could be retrieved from June 2016 to February 2017 at the Department of Oculoplasty of Biratnagar Eye Hospital, Rani, Biratnagar were included in this study.

Informed consent was taken from all the patients with chronic dacryocystitis who agreed to have external DCR surgery. All the patients had external DCR under local anesthesia except for pediatric age and uncooperative patients who had DCR surgery under general anesthesia with all pre-anesthetic requirements. Follow up was scheduled for day 2, two weeks, six weeks, three months and six months. Swelling, pain and pus in the wound postoperatively were considered as post-operative infection. Postoperative wound infection, bleeding or cheese wiring of the punctum were specifically noted. A patent lacrimal passage on syringing with symptomatic improvement at six months after surgery was considered as a successful outcome. The results were analyzed by the SPSS-19 software program, using Chi-square, and Fisher exact test.

## Surgical steps:

Nasal packing was done 15 minutes before surgery with nasal gauze soaked in oxymetazoline 0.05% plus 2ml adrenaline 1:1000 and xylocaine jelly into the desired nostril. Local anesthesia of 2% xylocaine with adrenalin 1:200000 was given subcutaneously and deep into the periosteum reaching anterior to the anterior lacrimal crest, posterior to the anterior lacrimal crest in the lacrimal sac fossa, and superior and posterior to the medial canthal tendon. Site and shape of incision varied among the surgeons.

They were either a 10 mm straight incision which was made 10 mm medial to the medial canthal tendon, with a No. 15 Bard Parker surgical blade or a curved incision of about 10-12 mm length. A blunt dissection was done to expose medial canthal tendon and overlying periosteum. Blunt dissector was passed into the lacrimal sac fossa and relatively thin lacrimal bone was fractured with periosteal elevator. The bony osteotomy of 10\*10mm was created with Kerrison rongeurs. Appropriate size was ensured by 45-degree-test with the lacrimal probe inserted into the canaliculi up to the sac.

The probe “tents” the medial wall of the sac and a longitudinal incision was made just below the “tent”. It created a long anterior flap and a shorter posterior flap that was trimmed. An H/ U shaped incision at the nasal mucosa was made. Silicone tube was inserted into the canaliculi, tied distally, anterior flap of both lacrimal sac and nasal mucosa and orbicularis muscle were sutured with 6-0 vicryl. Skin closure was done with 6-0 silk. Nasal pack was removed in all cases at the end of the surgery.

On the next day the patient was discharged with oral antibiotics (ampicillin 250mg plus cloxacillin 250mg 4 times daily) for 1 week and oral serratiopeptidase 3 times daily for 5days. These drugs were given according to the hospital protocol. Analgesics were prescribed as required and topical antibiotics (ciprofloxacin 0.3% eye drops four times daily) and ointment ciprofloxacin 2 times a day over the wound. Silicon tube was removed after 6 weeks.

## RESULTS

A total of 317 patients were included in the study. The mean age of the study population was 38.46 years (SD±13.6). The age ranged from 4 years to 70 years. Out of which 226(71.3%) were females and 91(28.7%) were males. Male: female ratio was 1:2.5. Almost equal distribution was seen in laterality of involved eyes (right eye 50.2% and left eye 49.8% respectively).

Watering with discharge was the commonest presenting symptom 224 (70.6%) followed by others as shown in table 2. Out of the total 317 patients 195(61.5%) were symptomatic for more than 1 year. Among the types of nasolacrimal duct obstruction (NLDO), except for 4 cases of congenital NLDO and 2 cases of post-traumatic NLDO, all other 311 cases had primary NLDO.

All the DCR surgeries were done either by consultant oculoplastic surgeons or by anterior segment fellows (n=114, 36 % and n=203, 64% respectively).

Bicanalicular silastic tube intubation was done in all patients below 40 years of age, those who had post traumatic NLDO and those patients who demanded to have intubation. So, DCR surgery with intubation was done in 195(61.5%) and without intubation in 122(38.5%) cases.

Among all 317 cases, only 114 patients (35.9%) were followed up to 6 months post operatively. Among the 114 patients 99(86.8%) had freely patent lacrimal system on syringing (successful DCR) and 15(13.2%) did not (failed DCR). Success rate of DCR surgery with tube was 73.7% in comparison with DCR without tube 26.3%, as shown in table 3. Fisher's exact test analysis showed it to be statistically insignificant (p = 0.064).

The success rate of surgery by consultant oculoplastic surgeons (32.5%) and that by anterior segment fellows (54.3%), was not statistically significant by chi-square test (p= 0.92), shown in table 3. Success rate of DCR surgery in our study among male and female (23.68 % and 63.15%) was also not statistically

**Table 1: Age distribution.**

Age Category	Frequency	Percentage
Less than 10	11	3.5
11-20	12	3.8
21-30	76	24.0
31-40	88	27.8
41-50	74	23.3
51-60	39	12.3
More than 60	17	5.4
Total	317	100.0

**Table 2: Presenting symptoms.**

Presenting symptoms	Frequency	Number of cases in percentage
Watering with discharge	224	70.6 %
Only watering	79	24.9%
Mucocele	8	2.5%
Fistula	6	1.9%
Total	317	100%

**Table 3: Cross tabulation of success and failure with various influencing factors.**

Influencing factors		Success	Failure	Statistical analysis
Tube status	With tube	73	07	*OR- 3.21, CI-95%(0.94-11.12) **p- value=0.064
	Without tube	26	08	
Operating surgeon	Consultants	37	06	***RR-0.99, CI- 95%(0.05-1.14) # p-value=0.92
	Fellows	62	09	
Gender	Female	72	12	***RR-0.95, CI- 95%(0.82-1.20) # p-value=0.77
	Male	27	03	

\*OR- odds ratio, CI- confidence interval

\*\*2 tailed p value (Fisher's exact test)

\*\*\*RR-relative risk

#Yates corrected p value (chi- square test)

significant. No other complications such as post-operative wound infection, bleeding or cheese wiring were seen in the follow up period.

## DISCUSSION

External DCR surgery is the most commonly performed surgery in oculoplasty department. The mean age group of our study population was 38.46 ( $\pm 13.6$ ) years. This finding is comparable to other studies by Saiju et al and Mishra et.al where mean age was 41 years and 40.42 years. In this study females had DCR surgery more than males (71.3% and 28.7%). This is comparable to other studies where female preponderance is seen.<sup>7</sup> This finding is consistent with a study by Zaman et al. That study stated that the narrow lacrimal fossa in females predisposes them to the obstruction by sloughed off debris due to the hormonal changes that bring about a generalized deepithelization.

The most common presenting symptoms were watering with discharge which accounted for 70.6%. Our finding was comparable with the study done by Badhu et.al where they had 60% study population with the same complaint as ours. But their study is not comparable with us in regard to the presence of mucocele as we had less cases (2.5%) than them (6%).<sup>8</sup> Regarding the presenting symptoms, our study where duration of symptoms for more than 1 year was in 61.5% of cases is not comparable with the study by Mohammad Al-Droos et.al. But our result can be compared with the study done by M. Alnawaiseh et al and Khadka S et.al.

We had 86.8% success rate of external DCR surgery in our study. our result is comparable with other literatures from Nepal where the success rate varies from 88% to 96.3%.<sup>4,6...</sup> Likewise, in the studies from other countries success rate varies between 80-99%.<sup>...</sup> We had compared the successful DCR with the surgery performed by oculoplastic surgeons and anterior segment fellows. The finding was statistically not significant ( $p=0.92$ ). The similar finding was shown in the study by Pandya et al.<sup>3</sup> However, they have also pointed out the fact that in most cases, fellows would have significant assistance from the supervising consultant. While studying the influencing factors of successful DCR surgery, we compared its success with bicanalicular silicon tube intubation. Success rate with silicon tube intubation was 73.7% and without tube was 26.3%. This was not statically significant ( $p$  value-0.064). In the study done by Saiju et.al they have concluded that success rate is high in both groups and silastic intubation in DCR for uncomplicated cases of NLDO is unnecessary. This may add the potential risk of intubation and increases the cost of surgery in a country with limited resources.<sup>6</sup> In a meta-analysis investigating the success rates of all types of DCR with and without silicone intubation, the authors have concluded that there was no added benefit of intubation to success rates. In our study, only 114(35.9%) cases came for follow up till 6 months. We removed the silastic tube after 6 weeks of surgery. Mainly those who did not have silastic tube intubated and had no complications post-surgery did not come for follow up. This may be due to financial and geographical restrains. More

patients with longer follow up would have given us a confirmed result of success rate. This is one of the limitations of this study along with its retrospective design.

## CONCLUSIONS

External dacryocystorhinostomy is still the choice of surgery for all kind of nasolacrimal duct obstruction due to its low cost value and high success rate. In a developing country like ours endoscopic

DCR is still a privilege for most of the population. Silastic intubation can be avoided in primary NLD obstruction without any pre or perioperative complications. There are no such factors that influence the outcome of surgery when done in a proper way.

**Conflict of interest:** None

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