ROLE OF POSTERIOR FLAP SUTURING IN EXTERNAL DACRYOCYSTORHINOSTOMY

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ABSTRACT

PURPOSE: *To determine the success of external dacryocystorhinostomy with suturing of the posterior flaps in patients with Complete Nasolacrimal Duct Obstruction*

*I**NTRODUCTION:** A significant cause of watering from the eyes is Primary acquired nasolacrimal duct obstruction (PANDO), the gold standard for the treatment of which is the conventional external dacryocystorhinostomy (DCR), which bypasses the Nasolacrimal duct (NLD), and has a success of 70-95%. A novel technique for improving the success further is to suture the posterior flaps as an end to end anastomosis like done in the case of anterior flaps.*

MATERIAL AND METHODS: *86 patients of both sexes and ages between 32-70 years of age with complete primary nasolacrimal duct obstruction presenting to the Outpatient department were included in the study after informed consent. The subjects were assigned to two groups. The patients in Group A underwent the conventional DCR with excision of posterior flaps, while those in group B underwent modified DCR with suturing of the posterior flaps. Patency of the lacrimal drainage system was assessed after 3 months, by syringing of the nasolacrimal passages.*

RESULTS: *The means age of patients was 57.18±8.60 years. There were 26 (31.3%) male patients while (69.7%) patients were female. The procedure was successful in 88.4% patients in Group A, while in group B the success was achieved in 93% of patients. However, the difference between success in two groups was not statistically significant.*

The procedure was successful in 80 (94.1%) patients (n=86). There was, however, no statistically significant correlation between age and gender, and the success of the procedure.

CONCLUSION: *Despite being technically difficult to master, the technique of posterior flap suturing in external DCR in cases of PANDO, has no statistically significant advantage over the conventional external DCR.*

INTRODUCTION

A significant cause of epiphora or watering from the eyes in adults is Primary Acquired Nasolacrimal Duct Obstruction (PANDO). It is usually due to inflammation of unknown cause of the nasolacrimal duct (NLD). The prolonged inflammation and recurrent infections result in fibrotic occlusion of the NLD.[1] The incidence of Nasolacrimal duct obstruction is 20 per 10,000.[2] External Dacryocystorhinostomy (DCR) with intubation is an effective procedure and involves the creation of a fistula between the lacrimal sac and nasal cavity, by-passing the NLD.[3,4]

The causes of failure after DCR are fibrosis, the relatively small size of the ostium, very high ostium, scarring within the rhinostomy, common canalicular obstruction, enlarged middle turbinate, Sump Syndrome.[5] The reported success rate of conventional external DCR ranges from 70% to 95%.[6] One of the proposed methods to prevent failure is to suture the posterior mucosal flaps in addition to suturing of the anterior mucosal flaps and intubation (rather than excising them as done in conventional external DCR). Pandya et al.[7] reported success in 73% of cases in Australia, while Baldeschi et al.[8] reported the success of this modification to be 98% in the Netherlands. Khan FA[5] and Nawaz M. et al.[9] have described the success of this procedure to be 97.1% and 83.3%, respectively, in Pakistan.

The purpose of this study was to determine the success of this modification in our region; only a couple of such studies are available for our country, that too, with a very small sample size. Moreover, as in literature, there is a significant disparity between success rates reported by various authors in different countries,[10] further investigation was needed to establish the actual success of the procedure.

OPERATIONAL DEFINITIONS

- **Nasolacrimal duct obstruction:** Obstruction of NLD was labelled if there was a failure of passage of fluid through it during Syringing.
- **Posterior flap suturing:** The two posterior mucosal flaps (posterior nasal flap and the posterior flap of lacrimal sac) were sutured using 5/0 Polyglactin.
- **The success of DCR:** It will be labelled if there is a

patent lacrimal passage on the Syringing of the lacrimal system after 16 weeks of posterior flap suturing.

MATERIALS AND METHODS

The study was designed as a quasi-experimental; set in the Institute of Ophthalmology, Mayo Hospital, Lahore, and took two years to complete.The sample size of 86 cases was calculated with a 95% confidence level, an 8% margin of error, and taking an expected percentage of success, i.e., 83% with external Dacryocystorhinostomy with suturing of the posterior flaps in patients with Complete Nasolacrimal Duct Obstruction. [6]Non-probability purposive sampling technique was used.

86 cases presenting in OPD of the Institute of Ophthalmology, Mayo Hospital Lahore, fulfilling the inclusion and exclusion criteria were included in the study. All patients were inquired about any systemic disease such as hypertension, diabetes mellitus,the level of control, and any systemic or ocular complications by these diseases.

All patients underwent complete ocular examination including visual acuity, slit-lamp examination for eyelid, lacrimalpuncta position, and presence of mucus or pus formation. Theregurgitation test and Jones's primary dye test were performed. The diagnosis of NLD obstruction was made based on history, examination, and the above-mentioned tests. All patients were examined by an ear, nose, and throat (ENT) specialist for any nasal pathology.

Demographic information like name, age, and gender were recorded. Then patients were admitted and scheduled for surgery. The patients were divided into two equal groups A and B (of 43 patients each) randomly; the patients in group A went under conventional Dacryocystorhinostomy while the patients in group B underwent Dacryocystorhinostomy with posterior flap suturing in addition to the conventional procedure. All surgeries were done by a single surgical team under general anesthesia. Then patients were followed till 16 weeks to note success (as per operational definition). All the information collected was noted on a special Performa.

Patients of both genders, aging from 32 to 70 years and having complete nasolacrimal duct obstruction confirmed by regurgitation test and syringing and probing of the lacrimal system, were included in the study. Whereas, patients having punctal or canalicular obstruction, or congenital or post-traumatic lid and facial bony abnormalities or having a lacrimal fistula or having nasal pathologies like gross DNS or hypertrophied middle turbinate were excluded from the study.

PROCEDURE

All the procedures were performed under general anaesthesia. Both the upper and lower puncta were dilated with Nettleship punctum dilator. Lacrimal irrigation was performed to confirm NLD block. A curvilinear skin incision was made, 2 mm above, and 8 mm below the medial canthal tendon. After careful blunt dissection, to avoid damaging angular vessels, the medial canthal tendon was exposed. The medial canthal tendon was incised, the lacrimal sac exposed; and the periosteum was incised and reflected posteriorly, exposing the anterior lacrimal crest and the lacrimal fossa. The osteotomy was initiated at the thin bone at the junction of the lacrimal and maxillary bone. This osteotomy was extended anteriorly up to 5 mm anterior to the anterior lacrimal crest. Posteriorly up to the posterior lacrimal crest, superiorly up to the insertion of medial canthaltendon, and inferiorly to the inferior orbital margin. A probe was passed into the lacrimal sac, and the sac was incised down to the NLD. Both the lacrimal sac and nasal mucosa were incised in an H shaped manner. The flaps made were of equal sizes.

In group A the posterior flaps were excised, while for the patients in group B the posterior sac and mucosal flap were sutured together with two sutures of 5/0 Polyglactin. At the same time, both the anterior flaps were sutured, also using the same technique in both groups. (Thus, in cases of group B, the passage was lined with two mucosal surfaces instead of one.) The medial canthal tendon was reattached to its insertion. Muscle and soft tissues were closed with 5/0 Polyglactin. The skin was closed with 6/0 Polyglactin mattress sutures. The patients were discharged on the second postoperative day and examined one week postoperative and then three months later when results were noted in the proforma.

DATA ANALYSIS

The data was entered and analysed through SPSS version 16. The quantitative data like age were presented as mean and standard deviation. The qualitative data, like gender and success,was presented as frequency and percentage. Data was stratified for age and gender. The Chi-square test was used post-stratification. P-value of ≤0.05 was considered as significant.[11]

RESULTS

- The mean age of patients was 57.18±8.60 years. There were 3 (3.4%) patients in the age group 30-40 years, 19 (22.0%) patients in 41-50 years, 32 (37.2%) patients in 51-60 years and 32 (37.2%) patients were >60 years of age. ***(Table-1)***
- Gender distribution showed that there in group A there were 12 (27.9%) male and 31 (72.1%) female patients. Whereas there were 14 (32.6%) male and 29 (67.4%)females patients. ***(Figure-1&2)***
- In group A, 38 (88.4%) patients had successful surgery, while in 5 (11.6%), the surgery was unsuccessful. Whereas, in group B, 40 (93%) patients had successful surgery, while 3 (&%) patients had unsuccessful surgery. ***(Table-2)***
- In group A, 38 patients had successful surgery; among these patients, 2 patients were in the age group 30-40 years, 6 patients in 41-50years, and 15 patients each in group 51-60 and those above 60 years. In terms of the p-value, no statistically significant association was present between the age of patients and the success of the procedure. i.e. ***(p-value=0.551)(Table-3)***

- In group B, 40 patients had successful surgery; among these patients, 1 patient was in the age group 30-40 years, 10 patients in 41-50 years, and 14 patients in group 51-60 and 15 in the group > 60 years. In terms of the p-value, no statistically significant association was present between the age of patients and the success of the procedure. i.e. ***(p-value=0.567)(Table3)***
- In group A, the patients who had successful procedures among them, 10 patients were male while 28 were female. According to the p-value, no statistically significant association was seen for the gender of the patients and the success of the procedure. i.e. ***(p-value=0.521)*** While in group B, the patients who had successful procedure among them, 13 patients were male while 27 were female. According to the p-value, no statistically significant association was seen for the gender of the patients and the success of the procedure. i.e. ***(p-value=0.976 (Table-4)***
- Further analysis revealed that there was no statistically significant difference in the success rate between the two groups with a p-value of 0.515.

TABLE 1: Age Distribution of Patients

N	86
Mean±SD	57.18±8.60
Age Groups	
30-40	3 (3.4%)
41-50	19 (22.0%)
51-60	32 (37.2%)
>60	32 (37.2%)
Total	86(100%)

FIGURE 1: Gender Distribution of Patients in Group A

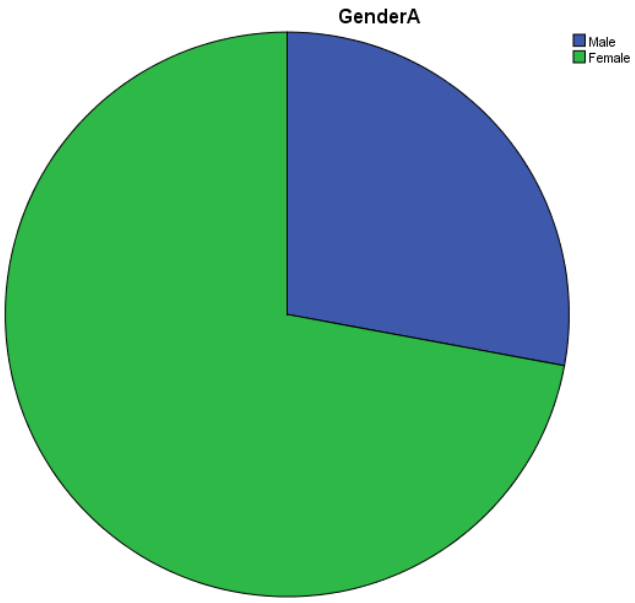

FIGURE 2: Gender Distribution of Patients in Group B

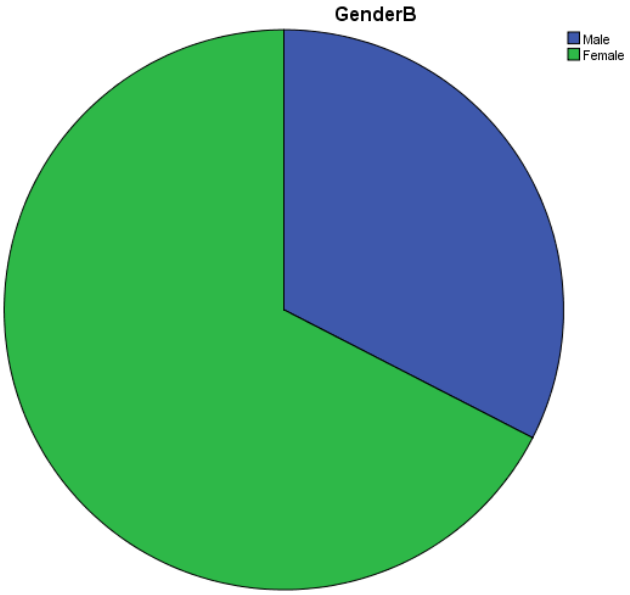

TABLE 2: Frequency Distribution for Success of Procedure

	Group A		Group B	
Success	Frequency	Percentage	Frequency	Percentage
Yes	38	88.4%	40	93%
No	5	11.6%	3	7%
Total	43	100	43	100%

Chi square = 0.5513, p=0.4578

TABLE 3: Success of Procedure in Terms of Age Groups of Patients

		GROUP A			GROUP B		
		Success		Total	Success		Total
		Yes	No		Yes	No	
AGE	30-40	2	0	2	1	0	1
	41-50	6	2	8	10	1	11
	51-60	15	1	16	14	2	16
	>60	15	2	17	15	0	15
Total		38	5	43	40	3	43
		Chi-Square Test=2.106			Chi-Square Test=2.028		
		p-value=0.551			p-value=0.567		

TABLE 4: Success of Procedure in Terms of Gender of Patients

		Group A			Group B		
		Successful	Unsuccessful	Total	Successful	Unsuccessful	Total
Gender	Male	10	2	12	13	1	14
	Female	28	3	31	27	2	29
Total		38	5	43	40	3	43
		Chi-Square Test=0.411			Chi-Square Test=0.001		
		p-value=0.521			p-value=0.976		

DISCUSSION

Excessive lacrimation from the eyes is quite prevalent, which can be caused by a multitude of factors, one of which is the obstruction of the nasolacrimal duct, which may be congenital or acquired. External Dacryocystorhinostomy has been the gold-standard procedure to alleviate the symptoms of this disease. Although conventional DCR has a documented success of around 90%, modifications have been adapted to enhance the efficacy of the procedure further.

A review of the literature shows that the causes of failure of this procedure are various and include fibrous tissue growth, inappropriate size or location of the bony ostium, obstruction of the common canaliculus, scarring in the nasal opening, hypertrophy of the middle turbinate, Sump syndrome, and active systemic diseases.[12,13]

The eventual results of the procedure depend upon an appropriately sized, placed, and patent mucosa-lined anastomosis between the two cavities. Over the years, an H-shaped incision has been used to divide the nasal mucosa and sac mucosa into anterior and posterior lamella; the anterior lamellae were excised while the posterior lamellae were excised. In this study, we, in addition to suturing anterior lamellae, performed end to end anastomosis of the posterior lamellae. This manoeuvre is technically tricky and quite time-consuming, even in expert hands. So, we wanted to assess whether utilising expertise and extra time is beneficial to a statistically significant level.

The mean age of patients in our study was 57.18 ± 8.60 years. The gender predisposition was towards the female side, with 69.7% of patients falling in this category, while 31.3% of patients were male, which is also seen in the study of Khan. [5]

In the case of conventional external DCR, the success rate achieved was 88.4% of cases while failure was encountered in 11.6% of cases; this correlates with previous studies like done by Mishra D(90%)[14], and Pandit VK(92-94%)[15] in cases of Posterior flap suturing successful results were achieved in 93% of cases and failure in only 7% of cases. This efficacy correlates with studies previously done like the studies by Katuwal (90.7%)[16], Elwan (90%)[17], and Khan (94.3%)[5].

No association between age and gender of the patient and the success of the procedure was seen in this study.

As seen in international and local studies the success of External Dacryocystorhinostomy with suturing of posterior flaps or excision of these posterior flaps, our study by giving a comparative success rate signifies that the fact that there is no additional advantage of suturing the posterior flaps and thus, the extra effort appears to be not that valuable. We assessed the success of surgery in terms of objective assessment only, whereas assessment into the symptomatic relief should have been done. Moreover, even for the objective evaluation syringing of the nasolacrimal passages was done, and other sophisticated measures like the endoscopic evaluation of ostium were not performed. Furthermore, the study is limited by a short duration of follow-up, as the asymptomatic patients mostly failed to report for long term follow-up.

CONCLUSION

It is hereby concluded that although suturing of the posterior flaps offers a theoretical advantage by providing a passage lined with two mucosal surfaces, as compared to the conventional procedure which offers one such surface, this does not translate into a statistically significant difference between the success of the two methods.

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