Modified external dacryocystorhinostomy with anterior flap anastomosis

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ABSTRACT

Aims: *To compare the surgical outcome of modified external dacryocystorhinostomy (DCR) with conventional external dacryocystorhinostomy and to evaluate the symptomatic relief of epiphora by Munk's score.*

Materials and Methods: *A prospective, interventional, comparative study of sixty patients with chronic dacryocystitis. They were divided into two groups; one group underwent conventional dacryocystorhinostomy whereas another underwent a modified technique of anterior flap anastomosis. Follow up period was eighteen months and were evaluated on the basis of sac syringing and Munk's score. Statistical analysis was done by chi square test.*

Results: *The mean age of the patients in our study in group 1 was 52.5 ±9.45 SD years (range 40-68 years) and group 2 was 51 ±10.15 SD years(range 38-70years) [Table 1].The female patients were more in both groups. The mean surgical time in group1 was 60.47 min ±5.14SD minutes, and group 2 was 84.66 ±3.99SD minutes.Surgical success was defined on the basis of patency of sac on syringing and improvement in Munk's score at the end of eighteen months.*

Conclusion: *The modified technique is easier to perform and equally effective alternative method for dacryocystorhinostomy.*

Key words: *Anterior flap anastomosis, Conventional DCR, Modified external DCR, Munk's score*

Access this article online	
Quick Response Code:	**Website:** www.innovativepublication.com
	DOI: 10.5958/2395-1451.2015.00002.5

INTRODUCTION

Epiphora due to acute and chronic dacryocystitis is the commonest symptom we come across in ophthalmology out patient department. The obstruction in the outflow passage is most often at the junction of sac and nasolacrimal duct hence creating an alternate drainage pathway is the mainstay of treatment. An external dacryocystorhinostomy is still considered the gold standard in the treatment of outflow passage block.[1,2] The conventional dacryocystorhinostomy was first described by Addeo Toti in 1904.[3,4] This initial procedure was modified by Dupuy-Dutemps and Bourguet in 1921, in which the lacrimal sac was incised to form anterior and posterior flaps and then sutured to nasal mucosa.[5, 6] The basic conventional dacryocystorhinostomy has a high success rate of around 93%-96%.[1,3] After the introduction of conventional dacryocystorhinostomy, many subsequent modifications have been tried such as nasolacrimal duct intubation,[7] endoscopic endonasal DCR,[2] and endonasal laser DCR.[8] Adjunctive Mitimycin C,[9] an anti metabolite was used as other alternative techniques to prevent fibrosis and proliferation at the ostium site. Also recanalization of the nasolacrimal duct with endodiathermy bipolar probe has recently been studied.[10]

In this prospective study we share our experience of one of the new modification in external dacryocystorhinostomy technique of anterior flap anastomosis.

MATERIAL AND METHODS

This prospective interventional study was carried out from September 2011 to May 2013 at a rural based tertiary care center of central India. Sixty consecutive cases of chronic dacryocystitis with or without mucocele were randomized into two groups based on a computer generated sheet after due consent. The sample size was calculated on the basis of prevalence of the disease in the community and the patients were enrolled by a para medical worker. Modified DCR was performed in group one and conventional DCR in group two, All patients with aged above 18 years and both sexes were included in the study. A detailed history and a complete ocular examination were done in all cases. All patients were subjected to nasal examination to rule out any nasal pathology. The exclusion criteria were patients less than 18years, those who had previous lacrimal sac surgery, any nasal or bony deformities, post traumatic sac area, external lacrimal fistula and failed DCR cases. Patients with common cannalicular block were also not included. All patients underwent preoperative sac syringing to find out the site of a block. Patients were asked to quantify the epiphora by asking them the number of times they require to wipe their eyes and

Munk's score was noted. Clinical classification of epiphora based on Munk's score,[11,12] is as follows-

Grade Description
1. No epiphora
2. Occasional epiphora once or twice a day
3. Epiphora 2-4 times a day
4. Epiphora 5-10 times a day
5. Epiphora >10 times a day

Surgical technique: All patients underwent the surgical procedure under local anesthesia. The nasal cavity of the side to be operated was packed with gauze soaked in xylocaine jelly 2% and an ampoule of adrenaline 1:100,000.The nasal packing was effective for decongestion and analgesia of the nasal mucosa.

A precise incision site was found to be very important for a blood less and better exposure of the surgical field. A vertical skin incision about 14-16mm was given medial to the medial canthus above the medial canthal ligament avoiding the angular vein.[Fig. 1] The subcutaneous tissue and orbicularis muscle was separated by blunt dissection .The anterior limb of medial canthal ligament was cut and separated to expose the sac.[Fig. 2] Nasolacrimal crest was visualized, periosteum elevated, the anterior lacrimal crest and the bone from lacrimal fossa were removed with bone punch to create a large bony ostieum. Nasal mucosa exposed and hemostasis achieved .An 'H' shaped incision was made on the sac in such a way that anterior flap made was larger than the posterior flap .The posterior flap was cut and removed. A'U' shaped incision was made on the nasal mucosa so that only one tongue shaped anterior flap was created.[Fig. 3] The anterior flap of sac was sutured with the nasal mucosa. In group two the sac incision was given and two equal size anterior and posterior flaps were created. An 'H' shaped incision was made on the nasal mucosa to create anterior and posterior flaps, which were sutured with the respective sac flaps.[Fig. 4] The wound was closed in layers after achieving hemostasis with 6-0 Vicryl. The skin wound was sutured by subcuticular suturing technique by 6-0 proline.

Patients were followed up on 7th day, 1stmonth, six months and 12th month after surgery. During the follow up,patency of nasolacrimal passage was checked by doing sac syringing and symptomatic epiphora scoring was done by Munk's score. The statistical calculations were done by Student's t test and Chi-square test.

Table 1: Age Distribution

	Group I		Group II	
Age Group	Frequency	%	Frequency	%
35-44	3	9.65	8	27.59
45-54	12	38.75	10	34.48
55-64	14	45.15	8	27.59
65-74	2	6.45	3	10.34
Total	31	100.0	29	100.0
	Chi Square=4.05		P Value=0.25	

Table 1 provides the distribution of patients according to age. The mean age of the patients in our study in Group I was 52.5 ±9.45 SD years (range 40-68 years) and Group II was 51 ±10.15 SD years(range38-70years).

Table 2: Sex Distribution

	Group I		Group II	
Sex	Frequency	%	Frequency	%
Female	24	78.1	23	79.31
Male	7	21.9	6	20.69
Total	31	100.0	29	100
	Chi Sq. =0.012		P=0.91	

Table 2 gives the distribution of patients according to gender. Female preponderance was seen in both groups, Group I 78.10% and Group II 79.31%.

Table 3: Surgical Time

Descriptive Statistics				t Value	p Value
Surgical Time (Min)	N	Mean	Std. Deviation		
Group I	31	60.47	5.143	20.37	<0.0001
Group II	29	84.66	3.99		

p value for surgical time is significant

Table 3 shows the surgical time required in both the groups. The mean surgical time in Group I was 60.47 min ±5.14SD minutes, and Group II was 84.66 ±3.99SD minutes

Table 4: Intraoperative Complications

Complications	Group I		Group II	
	Frequency	%	Frequency	%
Haemorrhage	1	3.1	1	3.45
Loss of Nasal Flap	2	6.3	2	6.89
Uneventful	29	90.6	26	89.65
Total	31	100.0	29	100.0

Table 4 analyses intraoperative complications in both the groups. The surgical procedure was uneventful in twenty nine patients (90.60%), nasal flap laceration occurred in two cases (6.30%) and intraoperative hemorrhage in one case (3.10%) in Group I whereas in Group II it was uneventful in twenty five cases (86.20%), nasal flap laceration was seen in three cases (10.34%) and excessive hemorrhage in one case (3.45%)

Table 5: Post-operative improvement of epiphora grade

	Pre-op score	Post-op score	SD	*t* value	*P* value
Group I	4	0.83	0.86	22.60	<0.0001
Group II	4	0.76	0.77	18.36	<0.0001

Table 5 shows pre-operative and post-operative Munk's score and the difference is statistically significant as *p* value is <0.001.

Table 6: Munk's scale (post op) Group I and Group II at the end of eighteen months:

Munks scale	Group I		Group I	
	Frequency	%	Frequency	%
Grade 0	5	16.12	3	10.34
Grade 1	23	74.19	24	82.75
Grade 2	1	3.22	0	0
Grade 3 Total	2 31	6.45 100	2 29	6.89 100
Success rate	90.32%		93.10%	

Table 6 provides the success rate in both groups. In Group I the success rate was 90.32% and in Group II it was 93.10%.

Fig. 1: Site of incision

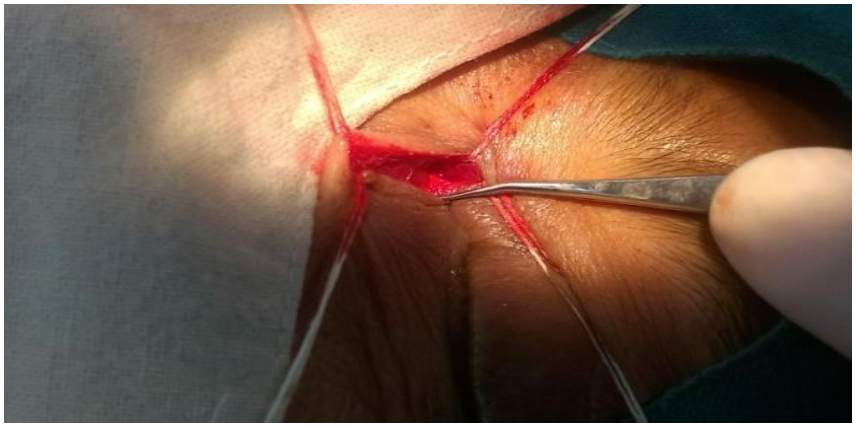

Fig. 2: Showing medial palpebral ligament

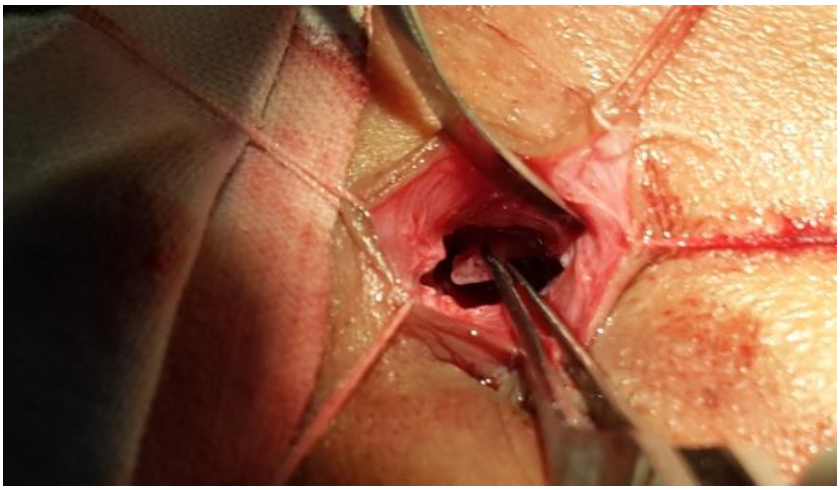

Fig. 3: Anterior nasal mucosal flap Fig.

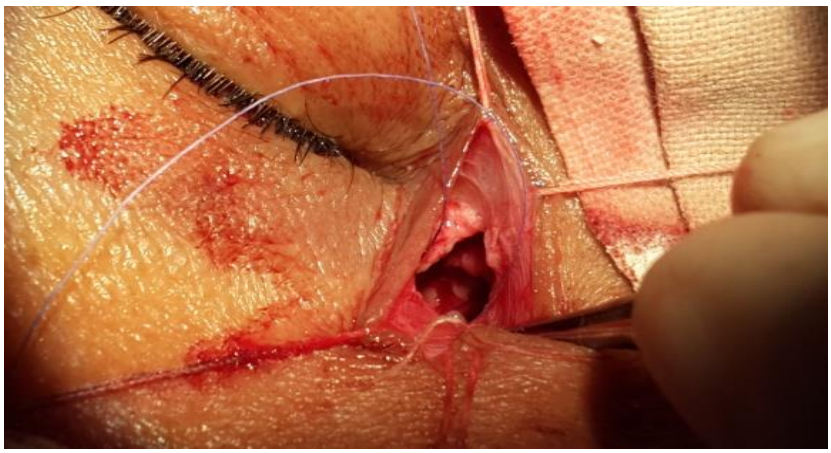

Fig. 4: Suturing of anterior flaps

RESULTS

The mean age of the patients in our study in group one was 52.5 ±9.45 SD years (range 40-68 years) and group 2 was 51 ±10.15 SD years(range38-70years) [Table 1].Female preponderance was seen in both groups, group one 78.10% and group 2 79.31% [Table 2]. The mean surgical time in group one was 60.47 min ±5.14SD minutes, and group two was 84.66 ±3.99SD minutes[Table 3].The surgical procedure was uneventful in twenty nine patients(90.60%), nasal flap laceration occurred in two cases (6.30%) and intraoperative hemorrhage in one case (3.10%) in **g**roup one whereas in group two it was uneventful in twenty five cases (86.20%),nasal flap laceration was seen in three cases (10.34%)and excessive hemorrhage in one case (3.45%) [Table 4].

Mean follow up was eighteen months.Statistically significant improvement was noted in epiphora grading post operatively in both the groups. According to Munk's score the mean score in group one was 0.83 with SD ±0.86 and in group two it was 0.76 with SD ± 0.77 [Table 5].

Success rate was defined by sac patency and symptomatic relief of epiphora by Munk's score. In group one the success rate was 90.32% and in group two it was 93.10%. [Table 6]

DISCUSSION

Surgical treatment is the mainstay of symptomatic chronic dacryocystitis. Although the success rate of conventional DCR varies between 85%-98.9%,[1,3]some pitfalls such as difficult posterior flap suturing, prolonged surgical time, intra operative patients discomfort were noted and hence various modifications have been tried.

In conventional DCR suturing of anterior and posterior mucosal flap maintains the patency of the pathway between the sac and nasal cavity .However the surgical procedure is not easy to perform and requires lot of experience.

The Modified DCR which we performed took lesser time and gave comparative results with the conventional method. In this instead of making two flaps a large anterior flap of the sac and the nasal mucosa was made and sutured which simplified the suturing with less surgical manipulation and time. The suturing of the posterior flaps in the conventional method is the most difficult step and quiet time consuming. In our study the postoperative success rate was evaluated objectively by performing sac syringing and subjectively by the Munk's score at the end of one month and sixth month follows up.

Gazmend K et al studied the outcome of external DCR with and without suturing the posterior mucosal flaps. They evaluated the success rate by lacrimal patency and symptomatic relief of epiphora and found that there was no statistically significant difference between the two groups. They concluded that the anterior flap anastomosis shows a success rate comparable with the conventional external DCR which was simpler, quicker and the surgical technique was easier to master as compared with the conventional DCR.[6] Similarly Faisal A K, et al compared the success rate of external DCR in 70 patients with suturing of posterior flaps and without suturing of posterior flaps by dividing in two groups. They found 97.1% and 94.3% success rate in Group A and Group B respectively which was statistically insignificant. [4]

Also in a study done by S Katuwal, et al posterior flap was excised and results were compared with conventional double flap DCR and concluded that excision of the posterior flap and anastomosis of only the anterior flap is not having any added advantages to the outcomes of external DCR surgery.[13]

Similarly, no statistically significant difference was observed in symptom outcome and success rate between patients in whom both mucosal flaps were sutured and those who had only the anterior

flap sutured by Pandya V, et al and Turkcu F, et al.[14, 15]

Serrin D, et al compared the results of external DCR by double flap anastomosis and excision of the posterior flap. They studied 63 cases which were divided into two groups on the basis of flap anastomosis. Post-operative evaluation was done on the basis of sac patency and epiphora and found no statistically significant difference between the two groups. The final success rate between the two groups was statistically insignificant (93.75% and 96.67%, respectively).They concluded that anastomosis of the anterior flaps only, do not affect the outcome of DCR surgery and is also easier to perform.[16]

Baldeschi L, et al did a modified external dacryocystorhinostomy in which very large anterior flaps of the lacrimal sac and nasal mucosa were created and sutures were passed through orbicularis oculi to elevate the anterior flap. They did not suture the posterior flaps and the success rate described was 100%. Thus they concluded that the modified technique can be used to simplify and speed up traditional external DCR without decreasing its well-known reliability.[17]

Elwan S did a randomized study comparing DCR with and without excision of the posterior mucosal flap, in which patients undergoing modified DCR had 85% success rate. Thus, he concluded that excision of the posterior sac mucosa may improve the success rate of external DCR.[18]

CONCLUSION

Our study demonstrated that, suturing of the anterior flaps only, gives comparable result to the conventional method with simplified suturing and less time. In spite of all new modifications being tried modified DCR is easier,quicker and an economical method which has almost replaced the conventional technique.

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