

# The Importance of Excising or Suturing the Posterior Mucosal Flaps in External Dacryocystorhinostomy

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**Purpose:** To compare the success rate of external dacryocystorhinostomy (with intubation) with suturing of the posterior flaps and without suturing of the posterior flaps.

**Material and methods:** A prospective comparative study of 70 patients attending the Ophthalmology Department Military Hospital Rawalpindi between Dec 2005 and March 2007 who underwent external DCR after dividing them into two groups of 35 each. In one group posterior flaps were sutured and in the other group posterior flaps were excised. All external DCRs were performed under general anesthesia. The posterior flaps were sutured with 5/0 vicryl or excised with spring scissors. All DCRs were intubated. The tube was removed after 03 months. At 04 months, the success was judged if there was relief of epiphora and potency confirmed by probing syringing.

**Results:** The success rate was 97.1% in DCR with suturing of the posterior flaps and 94.3% in DCR with excision of posterior flaps. Statistically the difference in results were insignificant. (P-value > 0.05).

**Conclusion:** The surgical success of DCR with suturing of the posterior flaps is statistically insignificant to DCR without suturing of the posterior flaps.

**D**acryocystorhinostomy (DCR) creates a fistula between the lacrimal sac and nasal cavity<sup>1</sup>. In 1904 Addeo Toti was the first to propose the technique of external DCR, his steps were to expose the lacrimal sac by an external incision, remove the medial wall, punch out a piece of bone with hammer and chisel<sup>1</sup>, resect a corresponding area of nasal mucous membrane and sew up the external wound<sup>2</sup>. The modern method was described by Dupuy-Dutemps and Bourget (1921), who incised the posterior wall without removal of tissue and approximated flaps of lacrimal sac and nasal mucosa<sup>2</sup>. Silicone tubing was introduced by Gibbs (1967) and used by Quickert and Dryden (1970) to intubate the nasolacrimal duct<sup>2</sup>. Older advocated that silicone tube is a useful adjunct to external DCR and should be used routinely<sup>3</sup>. External DCR has a success rate of 80 to 99% depending upon the surgeon's experience<sup>4</sup>. With silicone intubation the success rate of external DCR in

selected cases is 95 %<sup>5</sup>. External DCR in which only the anterior flaps are sutured with a slight modification of the bridge with the muscle layer has a success rate of 98.33%<sup>3</sup>. The DCR procedure may fail due to a number of causes which include fibrous tissue growth, inappropriate size or location of bony ostium, common canalicular obstruction, scarring within the rhinostomy, intervening ethmoid air cells, interference of middle turbinate, sump Syndrome and active systemic disease<sup>3</sup>.

Other than conventional external DCR, other techniques are being employed to relieve the obstruction of nasolacrimal duct, these include endoscopic DCR<sup>6</sup>, endoscopic nasal DCR<sup>7</sup>, dacryocystoplasty<sup>8</sup>, endoscopic radiofrequency assisted DCR<sup>9</sup>. In spite of all new technological advancements External DCR still continues to be the cheapest and very effective surgical procedure for majority of patients with epiphora in our country<sup>9</sup>.

The purpose of this study was to statistically compare the efficacy of external DCR with a slight modification in which the posterior flaps were sutured in one group and not sutured but excised in the other group; thus helping us in further polishing and refining our operative techniques of conventional DCR.

## MATERIALS AND METHODS

This study was carried out in Department of Ophthalmology Military Hospital Rawalpindi. The duration of study extended over fifteen months from December 2005 to March 2007 which included 70 patients. They were randomly divided into two groups of 35 each and labeled group A and B respectively. In group A external DCR was done with suturing of the posterior flaps while in group B posterior flaps were excised.

The inclusion criteria were adults having epiphora, chronic dacryocystitis, acute or chronic dacryocystitis and complete nasolacrimal duct obstruction confirmed with regurgitation test and probing and syringing. Patients younger than 15 years and those who had common canalicular and individual canalicular occlusion or post traumatic lid and bony deformities were excluded from the study.

All Patients underwent complete ophthalmic and nasal examination, puncta were particularly examined for malposition, and agenesis. Regurgitation test was performed and probing and sac syringing done. None of the patients was subjected to Schirmer's test, Jones dye test or Dacryocystography. History of diabetes, hypertension, ischaemic heart disease, bleeding disorder, aspirin use and antiplatelet therapy was taken. Fitness to undergo general anesthesia was obtained after relevant investigations and written informed consent was taken. All patients were admitted and were operated upon by the same surgeon. Skin incision was made which was slightly curved, slightly above the medial canthal tendon and carried downward for 20-25mm along the nose. After careful dissection the medial canthal tendon was incised exposing the lacrimal sac. The periosteum was incised and reflected posteriorly. Anterior lacrimal crest and lacrimal fossa were exposed. Osteotomy was initiated at the thin bone at the junction of the lacrimal and maxillary bone. The osteotomy extended anteriorly up to 5mm anterior to the anterior lacrimal crest, posteriorly up to the posterior lacrimal crest, superiorly up to the insertion of medial canthal tendon and inferiorly to the inferior orbital margin. A probe

was passed into the lacrimal sac and incised down to the nasolacrimal duct. The lacrimal sac flaps were prepared by making a horizontal H shaped incision in both patient groups whether posterior flaps were to be sutured or excised. Similarly the nasal mucosa was incised in H shaped manner. The patient group where posterior flaps were to be sutured equal size of both anterior and posterior lacrimal as well as nasal flaps were prepared whereas large anterior flaps were prepared in that group where posterior flaps were to be excised. Two stitches with 5/0 vicryl were applied to suture the posterior flaps' while whereas they were excised in group B patients. Intubation was done with silicone tube (0.6-0.8mm). Anterior flaps were sutured with 5/0 vicryl with two stitches. The medial canthal tendon was reattached to its insertion. Muscle and soft tissues were closed. The skin was closed with 7/0 vicryl mattress sutures. The silicone tube was tied with multiple square knots, and was not sutured to the nasal mucosa. Patients were discharged on the second postoperative day. First follow up was at one week and then at monthly intervals till 03 months. In all the patients the tube was removed at 03 months. At 04 months the success of DCR was evaluated if there was symptomatic relief of epiphora and a patent lacrimal passage on probing and irrigation.

## RESULTS

70 patients were operated, 20 were male and 50 were female. Male to female ratio was approximately 1:2.5 (Table 1).

The presenting complaints among the patients included epiphora alone in 55(78.6%) cases, 10(14.3%) cases had epiphora with mucocoele and 5(7.1%) cases had acute on chronic dacryocystitis (Table 2).

Intraoperatively the surgery was uneventful in 67(95.7%) out of 70 cases. 01 (1.4%) case required middle turbinectomy, 02(2.9%) cases had bleeding from nasal mucosa.

During the follow-up period no complications were encountered in the 68 (97.1%) cases and the tube was tolerated well except in 02(2.8%) cases the silicone tube migrated laterally which was repositioned surgically.

At 04 months in group A, 34 (97.1%) cases out of 35 had symptomatic relief of epiphora and patency of lacrimal passage was confirmed with probing and irrigation. In 01(2.9%) case with persistent epiphora probing and irrigation showed obstruction at the level of anastomosis.

At 04 months in group B, 33 cases out of 35 (94.3%) were relieved of epiphora and patency of lacrimal passage was confirmed with probing and irrigation. In 02(5.7%) cases probing and irrigation revealed obstruction at the level of common canaliculus.

The success rate of DCR in group A was 97.1% and in group B 94.3%. (Table-3) Chi square test was used to compare the frequency of success of group A with group B at a confidence limit of 95%. P-value was 0.555 which was greater than 0.05. Therefore the success rates between group A and group B were statistically insignificant (Table-3).

**Table 1:** Gender wise distribution of patients (n=70)

Gender	Cases n=70 (%)
Male	20 (28.5)
Female	50 (71.4)

**Table 2:** Presenting complaints

Presenting Complaints	No. of patients n=70 (%)
Epiphora	55(78.6)
Epiphora with mucocoele	10(14.3)
Acute on chronic Dacryocystitis	5(7.1)

**Table 3:** Comparison of the frequency of success between Group A\* and Group B\*\*

Group Category	Successful DCR***	Failed DCR***	Total
	Frequency	Frequency	
	n (%)	n (%)	
Group A* (n=35)	34 (97.1)	1 (2.9)	35
Group B** (n=35)	33 (94.3)	2 (5.7)	35

## DISCUSSION

This study was conducted with an aim to compare the two different techniques of external DCR with suturing of the posterior flaps and excision of the posterior flaps and its effect on the success of DCR.

Preoperatively canalicular obstruction may have an affect on the success. Burns and Cahill reported a success rate of 81% in patients with concomitant canalicular disease and 98% without preoperative

canalicular disease<sup>10</sup>. In our study, patients with punctal and canalicular disease were excluded.

The review of literature shows that external DCR may fail due to a number of factors including fibrous tissue growth, inappropriate size or location of bony ostium, common canalicular obstruction, scarring within the rhinostomy, intervening ethmoid sinus air cells, interference of middle turbinate, Sump syndrome and active systemic disease<sup>11,12</sup>. In our study the exact cause of failure could not be detected as patients did not agree to be reoperated but with probing the level of obstruction was noted at the site of anastomosis in one and at the common canaliculus in two cases.

Various modifications in the surgical steps of external DCR have been introduced over the years for a better surgical outcome. Studies in which both anterior and posterior flaps were anastomosed and without intubation report success rates of 94%<sup>13</sup>. In Pakistan; Ashraf reported a success rate of 100%<sup>14</sup> Serin et al reported that with posterior flap anastomosis success rates was 93.75% and with resection it was 96.67%. There was no statistically significant difference in success rate (p = 0.593). He suggested that DCR with double-flap anastomosis has no advantage over DCR with only anterior flaps<sup>15</sup>. Elwan reported a success rate of 90% with excision of posterior flaps and 85% with suturing. He concludes that excision of the posterior sac mucosa may improve the success rate<sup>16</sup>. Baldeschi et al anastomosed large and mobile anterior flaps of the lacrimal sac and nasal mucosa and passed sutures through orbicularis oculi to elevate the flaps forward and did not suture posterior flaps with a success rate of 100%. He believes that his modified technique can be used to simplify and speed up traditional external DCR without decreasing its well known reliability<sup>17</sup>. Zaman et al gave a success rate of 98.33% he also sutured only the anterior flaps and engaged them in the muscle layer<sup>3</sup>.

Intubation of the reconstructed lacrimal passage is a useful modified procedure. In international studies with intubations Iliff reported 90%<sup>18</sup>, Tarbat and Custer reported 95%<sup>19</sup> and Dolman reported 90.2%<sup>20</sup> success rates. In comparative studies, Hussein et al mentioned 94.7% success results in intubated and 77.8% success results in nonintubated cases<sup>21</sup>. Similarly Advani et al reported success rates of 95% in intubated and 88% in nonintubated cases, these are significant differences<sup>5</sup>. But Zaman et al reported statistically insignificant results in intubated and in non intubated cases. But they concluded that better

results in nonintubated DCRs were because they did not include complicated cases and had stitched the mucosal bridge with the muscle layer<sup>22</sup>.

Evaluating the outcome of DCR with intubation and suturing or excising the posterior mucosal flaps has also been the focus of many studies. In our study the success rate in the group with intubation and suturing of the posterior flaps was 97.1% and 94.3% with intubation and excision of the posterior flaps. In non comparative studies with intubation and suturing of the posterior flaps Ali and Ahmed reported a success of 84.6%<sup>9</sup>. Their lower success compared with our study was due to the presence of preoperative canalicular obstruction and dislodgment of tube. Similarly Baig et al reported a success rate of 87% and attributed failure to common canalicular obstruction, fibrous closure of ostium and bony ostium problem<sup>4</sup>.

In studies with intubation and not anastomosing the posterior flaps, Zaman et al<sup>22</sup> reported a success rate of 97.5% and Talpur et al<sup>23</sup> reported 98.14% success, both of which are comparable to our result. In a prospective study on 94 patients Dareshani et al compared the success rate in which they sutured anterior and posterior flaps in one group and left the posterior flaps unsutured in the second group. A stent was placed in all the 94 patients. The success rate in sutured group was 97.6% and 94.2% in the unsutured group<sup>24</sup>. The results of their study are identical to our study.

To make an ultimate decision, studies have evaluated the final size of the ostium after external DCR. Ezra et al assessed the soft tissue anastomosis using B mode USG. Their final conclusion was that, to improve surgical success, it is important to create as large a rhinostomy as possible and also extensively suture both the anterior and posterior flaps<sup>25</sup>. Yazici and Yazici used Digital subtraction macrodacryocystography for assessing the ostium. Their conclusion was contrary to Ezra et al. They reported that the final ostium height did not correlate with osteotomy site. Moreover they concluded that suturing the posterior lacrimal and nasal flaps does not affect the ultimate ostium size<sup>26</sup>.

## CONCLUSION

The results of our study were statistically insignificant which are in agreement with the results reported in national and international data including the use of latest techniques such as Digital subtraction macrodacryocystography. We therefore suggest that

the decision to suture or excise the posterior flaps should be decided intraoperatively depending upon anatomy of the nasolacrimal area, condition of the posterior flaps and surgeon's experience. With intubation the outcome can be further improved.

Though the future of lacrimal surgery is changing, external dacryocystorhinostomy is still the most economical, effective surgical procedure for relieving epiphora in Pakistan and is still the gold standard by which other modern methods are measured.

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