

## ORIGINAL PAPER

# Anterior Flaps Anastomosis in External Dacryocystorhinostomy

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**Purpose:** To evaluate the outcome of the modified technique of external dacryocystorhinostomy with anterior flaps anastomosis only. **Methods:** This prospective study included 52 patients with lacrimal drainage system disorders who underwent the modified technique of external dacryocystorhinostomy with anterior flaps anastomosis only. In this modified procedure of external dacryocystorhinostomy, anastomosis of anterior flaps only was created by suturing anterior flaps of the lacrimal sac and nasal mucosa, whereas posterior flaps were excised. The success rate and potential complications were recorded during the follow-up period. **Results:** The mean age of the patients was  $44.6 \pm 9.9$  SD years, including 37 females and 15 males. Mean of follow up was  $17.1 \pm 1.8$  SD months. Intraoperative complications, hemorrhage occurred in 3 cases (5.8%) and laceration of the nasal mucosa in 2 cases (3.8%). The surgery was uneventful in 47 cases (90.4%). The postoperative complication was closure of the anastomosis that occurred in 2 cases (3.8%). The success rate was evaluated by lacrimal patency to irrigation and relief of epiphora. Fifty patients (96.2%) showed a patent lacrimal system to irrigation and relief of epiphora, 2 patients (3.8%) had recurrence of epiphora and not patent lacrimal system to irrigation. **Conclusion:** This modified technique of external dacryocystorhinostomy with anterior flaps anastomosis only simplifies the surgical procedure and is effective in the management of obstruction of lacrimal drainage system beyond the common canalicular opening. Although it is simpler, quicker and easier to master the surgical technique, external dacryocystorhinostomy with anterior flaps anastomosis only shows a success rate comparable with those found in traditional external dacryocystorhinostomy. Further studies with larger series of cases are necessary. **KEY WORDS:** EXTERNAL DACRYOCYSTORHINOSTOMY, ANTERIOR FLAPS, ANASTOMOSIS.

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## 1. INTRODUCTION

The watering eye may be the result of excessive tear production, abnormalities of lid position or movement, lacrimal canalicular pump failure, or obstruction of the outflow tract. With ex-

ternal dacryocystorhinostomy (DCR), the lacrimal sac is directly incorporated into the lateral wall of the nose, so that the canaliculi drain directly into the nasal cavity (1). In 1904 Addeo Toti (2) first described the technique of ex-

ternal DCR. In his operation, the lacrimal sac was exposed through an external skin incision, a lacrimal fossa rhinostomy was performed, the nasal mucosa and medial portion of the lacrimal sac excised, and the wound closed with skin sutures. This procedure had a high failure rate secondary to cicatrization of the rhinostomy site. More advanced method that appeared to be a very successful procedure was described by Dupuy-Dutemps and Bourguet (3) in 1921. In this procedure, rather than excising a portion of the sac, the lacrimal sac was incised, forming both anterior and posterior flaps, and then carefully anastomosed to the nasal mucosa. Numerous modifications of this surgical procedure have been introduced over the years for a better surgical outcome without altering its basic concept. The aim of this study was to evaluate the outcome of the modified technique of external dacryocystorhinostomy with anterior flaps anastomosis only.

## 2. MATERIALS AND METHODS

This prospective study included 52 patients with lacrimal drainage system disorders who underwent the modified technique of external dacryocystorhinostomy with anterior flaps anastomosis only, treated between May 2007 and October 2008. Complete ophthalmic examination and lacrimal irrigation was performed in all cases. Nasal examination was performed to exclude any pathological growth or bony abnormality. Patients younger than 20 years

old, those who had previous failed DCR, and those with post traumatic lid and bony deformities were excluded from the study. All the operations were performed under local anesthesia by one surgeon (GK).

### 2.1. Surgical technique

In this modified procedure of external dacryocystorhinostomy, anastomosis of anterior flaps only was created by suturing anterior flaps of the lacrimal sac and nasal mucosa, whereas posterior flaps were excised.

A straight 15 mm skin incision, placed 10-12 mm nasal to the medial canthus and tangential to the inferonasal rim of orbit is made. After that, the orbicularis muscle is bluntly dissected, and the anterior limb of medial canthal tendon and periosteum are exposed. The skin and the orbicularis muscle are raised medially and laterally with two blunt rake retractors. The anterior limb of the medial canthal tendon is incised exposing the lacrimal sac. The periosteum is incised and reflected posteriorly. Anterior lacrimal crest and lacrimal fossa are exposed. An osteotomy 15 x15 mm wide, in the lateral nasal wall is created with dental drill and the nasal mucosa exposed. The bony window includes the entire anterior lacrimal crest, lacrimal fossa, and superomedial wall of the nasolacrimal canal.

The next step was to fashion the mucosal flaps. A "00" Bowman probe is inserted through the inferior canaliculus into the lacrimal sac, tenting up the medial wall of the sac. The sac is opened with a no. 11 blade from the upper fundus down to the proximal nasolacrimal duct. A "U" shaped incision is made in the lacrimal sac to create the anterior flap of the sac. Same "U" shaped incision is made in exposed nasal mucosa to create the anterior flap of the nasal mucosa. Remnants of the posterior mucosal flaps are excised.

In six cases there was evidence of medial common canalicular obstruction. The common canalicular opening is created by resection the scarred internal ostium using a no. 11 blade. The patent canaliculi are then intubated with silicone tubes.

Anterior mucosal flaps are sutured with three separate 6-0 Vicryl sutures, passing through the superior, middle

and inferior edges of the flaps and tied in three knots. The sutures are then cut a few millimeters above the knot. In this way we created an anastomosis by suturing only anterior flaps of the lacrimal sac and nasal mucosa. Upon completion of the mucosal anastomosis, the periosteum and orbicularis muscle are sutured with 6-0 Vicryl and the skin with prolene 6-0. The skin sutures are removed after 7 days, the silicone tubes after 3-6 months. The use of steroids drops and oral antibiotics is recommended for 1 week after surgery. Patients were discharged on the first postoperative day.

Follow-up examinations were scheduled on the first and 14th postoperative day, and after 1, 3, 6, 12 and 18 months from the date of surgery. Lacrimal irrigation was performed at each visit. Surgery was considered successful when the patient had no epiphora and a patent lacrimal passage on irrigation.

### 3. RESULTS

The mean age of the patients was 44.6±9.9 SD years (range 22-63 years). Treated patients of the age range of 50-59 years were the majority (34.6%) (Table 1). Females were predominant in our study. Thirty seven (71.2%) were female, and 15 (28.8%) were male.

Lacrimal drainage system disorders included in this study were nasolacrimal duct obstruction in 20 cases (38.5%), medial common canalicular obstruction in 6 cases (11.5%), chronic dacryocystitis in 23 cases (44.2%) and lacrimal fistula in 3 cases (5.8%). Cases of nasolacrimal duct obstruction (38.5%) and chronic dacryocystitis (44.2%) predominated among operated patients within this research (Table 2).

Age in years	No.	%
20-29	5	9.6
30-39	11	21.1
40-49	15	28.9
50-59	18	34.6
60+	3	5.8
Total	52	100.0
Xmax	63	-
Xmin	22	-
Xb	44.6	-
SD	9.9	-
VC	22.3	-

TABLE 1. Age distribution

Lacrimal drainage system disorders	No.	%
Nasolacrimal duct obstruction	20	38.5
Medial common canalicular obstruction	6	11.5
Chronic dacryocystitis	23	44.2
Lacrimal fistula	3	5.8
Total	52	100.0

TABLE 2. Lacrimal drainage system disorders

Complications	No.	%
Hemorrhage	3	5.8
Laceration of the nasal mucosa	2	3.8
Uneventful	47	90.4
Total	52	100.0

TABLE 3. Intraoperative complications

Mean of follow up was 17.1±1.8 SD months (range 12-18 months). The mean duration of tubes was 4.8±1.1 SD months (range 3-6 months). The mean operative time was 34.1 minutes (range 25-45 minutes).

Intraoperatively the surgery was uneventful in 47 (90.4%) out of 52 cases, while in 3 cases (5.8%) we had hemorrhage and in 2 cases (3.8%) laceration of the nasal mucosa (Table 3). During the follow-up period no complications were encountered in 50 cases (96.2%), while in 2 cases (3.8%) the postoperative complication was closure of the anastomosis. Complications such as wound infection or cellulites were not observed during the postoperative period.

The success rate was evaluated by lacrimal patency to irrigation and relief of epiphora. Fifty patients (96.2%) showed a patent lacrimal system to irrigation and relief of epiphora, 2 patients (3.8%) had recurrence of epiphora and not patent lacrimal system to irrigation. The success rate of surgical procedure used in this study was 96.2%.

### 4. DISCUSION

External DCR is a highly successful procedure for the treatment of any obstruction of the lacrimal drainage system lying distal to the internal opening of the common canaliculus. The success rate of external DCR has been reported between 90% and 100% depending on the surgeon's experience (4, 5, 6, 7, 8). In recent times, endonasal laser and intracanalicular laser DCR have been

gaining in popularity over traditional DCR owing to advantages of no scar, less tissue damage and less intraoperative time. However, these procedures have their own limitations and long term results are not yet available. Endonasal laser DCR presents a long term success rate of 75% (9) versus 90-100% of external DCR (4, 5, 6, 7, 8). This procedure is impossible to perform after trauma or in the presence of an altered bony anatomy of the region (9). Even if tissue damage due to the laser approach is minimal, in clinical practice supplementary turbinectomy or septoplasty may be necessary (10).

External DCR is a reliable but difficult surgical technique and requires considerable experience as well as operative time. Its limitations are the difficult resection and suture of the mucosal flaps, and the possible postoperative closure of the newly created lacrimal tract, either by formation of granulation tissue at the osteotomy level or by adhesion of the anterior to the posterior flaps. To overcome these, several authors have suggested different modifications of traditional external DCR. In this regard we have presented a modified technique of external DCR with anterior flaps anastomosis only. This technique is a common variation of traditional external DCR. Making anterior flaps only facilitate their surgical manipulation and the flaps can be easily sutured. On the other hand, suturing the posterior flaps often constitutes a difficulty and make take a considerable amount of time, particularly in the presence of bleeding during the surgery. This modified technique simplifies DCR procedure is easy and quick to perform. Although it is simpler and easier to master the surgical

technique, this procedure shows a success rate comparable to that obtained by more complex traditional external DCR. Dareshani et al. (11) compared the success rate in which they sutured anterior and posterior flaps in one group and left the posterior flaps un-sutured in the second group. The success rate in sutured group was 97.6% and 94.2 in the un-sutured group. Baldeschi et al. (12) anastomosed large and mobile anterior flaps of the lacrimal sac and nasal mucosa and passed sutures through the orbicularis muscle to elevate the flaps forward and did not suture posterior flaps with a success rate of 100%. Elwan (13) 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 success rate. Serin et al. (14) reported that with posterior flap anastomosis success rate was 93.75% and with resection it was 96.67%. He suggested that DCR with double-flap anastomosis has no advantage over DCR with only anterior flaps.

## 5. CONCLUSION

This modified technique of external dacryocystorhinostomy with anterior flaps anastomosis only simplifies the surgical procedure and is effective in the management of obstruction of lacrimal drainage system beyond the common canalicular opening. Although it is simpler, quicker and easier to master the surgical technique, external dacryocystorhinostomy with anterior flaps anastomosis only shows a success rate comparable with those found in traditional external dacryocystorhinostomy. Further studies with larger series of cases are necessary.

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