

Comparison of the Results of Anterior and Anterior-Posterior Flap in External Dacryocystorhinostomy Surgery

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Department of Ophthalmology, University of Health Sciences, Kanuni Sultan Süleyman Training and Research Hospital, İstanbul, Türkiye

ABSTRACT

Objective: The aim of this study was to compare the success rates of anterior and anterior-posterior flap anastomosis techniques in external dacryocystorhinostomy (DCR) operations.

Materials and Methods: In our clinic, 82 eyes of 82 patients who underwent external DCR due to epiphora and chronic dacryocystitis were analyzed retrospectively. All of these patients' lacrimal canals were intubated with silicone tube. External DCR surgery was performed with single flap anastomosis in 42 eyes of 42 patients and double flap anastomosis in 40 eyes of 40 patients and control examinations were performed at 1, 3, 6, and 12 months. Surgical success was defined by open punctum lavage and by absence of epiphora after follow-up of 12 months.

Results: A total of 82 cases, 62 females and 20 males, were included in the study. Anterior flap surgery was performed in 42 cases and anterior-posterior flap surgery was performed in 40 cases. Of the 40 patients who underwent anterior-posterior flap surgery, 11 were male and 29 were female, and the mean age was 46.53 ± 15.15 years. Of the 42 patients who underwent anterior flap surgery, 9 were male, 33 were female, and the mean age was 48.19 ± 14.15 years. While the mean follow-up period of the anterior-posterior flap group was 15.7 ± 3.4 months, the follow-up period of the anterior flap group was 16.5 ± 4.2 months. The success rate was 92.5 % in the anterior-posterior flap group and 90.5 % in the anterior flap group. There was no statistically significant difference between the groups in terms of surgical success ($p > 0.05$).

Conclusion: The success rates of the DCR techniques with anterior and anterior-posterior flap anastomosis were similar. Since there is no significant difference in terms of surgical success, the anterior flap anastomosis may be preferred because of the easy technique.

Keywords: Anterior flap, anterior-posterior flap, external dacryocystorhinostomy

How to cite this article: Karademir Z, Özdemir FE, Koçak İ. Comparison of the Results of Anterior and Anterior-Posterior Flap in External Dacryocystorhinostomy Surgery. CM 2024;16(2):65-68

INTRODUCTION

Dacryocystitis is most commonly caused by infection in the lacrimal sac as a result of acquired nasolacrimal duct obstruction.^[1] Although the etiology of most cases of dacryostenosis is idiopathic, it has been hypothesized that the obstruction is caused by inflammation from the nose and sinuses.^[2,3]

External dacryocystorhinostomy (DCR) is the most commonly performed procedure in the treatment of nasolacrimal duct obstruction.^[4] External DCR was first described

by Addeo Toti in 1904 for creating a new mucosa-lined pathway between the lacrimal sacs and tear ducts and the nasal cavity to bypass the obstruction.^[5]

In 1921, Dupuy-Dutemps and Bourguet created anastomosis by suturing between nasal mucosa flaps and lacrimal sac. In this technique, flaps are created with an "H" (anterior-posterior flap) shaped incision in the lacrimal sac and nasal mucosa and sutured.^[6] Instead of the classical "H flap", modifications such as "single anterior flap" with posterior flap excision or "U flap" by adding the lower flap piece to the



Address for Correspondence: Zeliha Karademir, Department of Ophthalmology, University of Health Sciences, Kanuni Sultan Süleyman Training and Research Hospital, İstanbul, Türkiye

E-mail: zlh_koyuncu@hotmail.com **ORCID ID:** 0000-0001-8805-0229

Received date: 29.12.2023

Revised date: 24.04.2024

Accepted date: 29.04.2024

Online date: 03.05.2024



upper flap or creating only the inferior flap instead of anterior-posterior flaps have been reported.^[7-10]

This study aimed to compare the success of anterior flap and anteroposterior flap technique in external DCR surgery.

MATERIALS and METHODS

In this study, 82 eyes of 82 patients who underwent external DCR for nasolacrimal duct obstruction in Kanuni Sultan Süleyman Training and Research Hospital ophthalmological clinic and attended regularly for follow-up visits were evaluated. The level of nasolacrimal duct obstruction was determined by punctum lavage. Patients with previous lacrimal duct surgery, nasolacrimal obstruction due to trauma, and deviated septum were not included in the study. In addition, patients who developed complications during surgery (flap loss, mucosa loss) were not included in the study because they would affect the surgical success rate.

Preoperative detailed ophthalmic examination was performed in all patients and nose examination was requested from all patients with nasolacrimal obstruction in terms of possible intranasal pathologies (deviated septum, turbinate hypertrophy). All patients were evaluated in terms of age, gender, follow-up period, surgical technique (anterior flap / anterior-posterior flap) and surgical success.

All cases were operated under general anesthesia by a single surgeon. After placing an adrenaline tampon in the nose, 2% lidocaine + % 0.0125 adrenaline solution was injected into the lacrimal sac area where the skin incision was to be made. A 15–20 mm skin incision was made at a distance of 7–8 mm from the medial canthus and starting from 1–2 mm above it. After dissecting the subcutaneous tissue with Westcott scissors, the periosteum of the nasal bone was exposed by blunt dissection. The lacrimal sac was removed from the lacrimal fossa. The periosteum was dissected and a bone window was opened a small hole with a bone punch. In the first group, 'H' shaped anterior and posterior flaps were formed on the sac and nasal mucosa. In the second group, only anterior flap was formed in the shape of 'U'. In cases where a single flap was designed, care was taken to make the flap large. Lacrimal and nasal flaps were sutured 2–3 times with 6/0 vicryl suture. A silicone tube was passed through the upper and lower punctum and connected to each other in the nasal cavity. The flaps were suspended to the orbicular muscle and closed with skin and subcutaneous 6/0 suture. Postoperative antibiotics and steroid drops were used 4 times a day for 2 weeks. Postoperative systemic broad-spectrum antibiotic treatment was

added in cases with secretion in the sac. All patients were evaluated on the first postoperative day and were called for follow-up visits at the 1st week, 1st month, 3rd month, 6th month and 12th month. Bicanalicular silicone tubes were removed after 3 to 5 months. Patients with clear punctum lavage and no complain of tearing at the twelfth-month controls were considered surgically successful.

All procedures were approved by the Kanuni Sultan Süleyman Training and Research Hospital Ethics Committee, (Date: July 23, 2020, No:2020.07.145). It was studied in accordance with the principles of the Declaration of Helsinki.

Statistical Analysis

IBM SPSS Statistics for Windows, Version 24.0 (IBM Corp., Armonk, NY, USA). was used. Data were summarised as mean±standard deviation. Chi-square test was used for gender distribution according to groups and Fisher's exact test was used to evaluate recurrence, $p < 0.05$ was considered statistically significant.

RESULTS

This study was conducted according to the "Declaration of Helsinki" and approved by the Clinical Research Ethics Committee of Kanuni Sultan Süleyman Training and Research Hospital, A total of 82 patients, 62 females and 20 males, who underwent external DCR in the eye clinic of Kanuni Sultan Süleyman Training and Research Hospital between 2017 and 2020, were included in the study. The mean age of the patients was 47.38 ± 14.5 years. The mean postoperative follow-up period was 16.2 ± 3.8 months. The demographic characteristics of patients who underwent only anterior flap and anterior-posterior flap are given in Table 1. There was no difference between the groups in terms of gender, age and follow-up time.

Recurrence occurred in 4 patients with anterior flap after a mean follow-up period of 16.5 ± 4.2 months, whereas 3 patients with anterior posterior flap had recurrence after a mean follow-up period of 15.7 ± 3.4 months. There was no statistically significant difference between the groups in terms of surgical success ($p > 0.05$, Table 2). All recurrences were observed within the first 3 months postoperatively in both groups. Endoscopic examination revealed adhesion between the nasal septum and anterior flap in 1 case, whereas the ostium was closed with granulation tissue in 2 cases with anterior-posterior flap. Since the cases with intraoperative complications with flap loss were not included in the study because of their effect on surgical success, complication evaluation between the groups was not performed.

Table 1. Demographic characteristics of the patients

	Anterior flap (n=42)	Anteroposterior flap (n=40)
Gender, n (%)		
Female	33 (78.6)	29 (72.5)
Male	9 (21.4)	11 (27.5)
Age (years)	48.19 (\pm 14.15)	46.53 (\pm 15.15)
Follow-up period (month)	16.5 \pm 4.2	15.7 \pm 3.4

DISCUSSION

External DCR is the gold-standard surgical method in the treatment of acquired nasolacrimal obstruction.^[11] The success rate varies between 80% and 99% according to the experience of the surgeon and the technique applied in various studies.^[12,13] In our study, our surgical success rate in all cases was 91.5 % in accordance with the literature.

For a successful surgical operation, the lacrimal sac and nasal mucosal flaps must be opened appropriately and carefully to provide an adequate fistulisation and nasolacrimal patency. External DCR surgery is technically challenging and requires experience. Failure to suture the anterior and posterior flaps well during surgery may result in granulation and fibrosis, which may increase the risk of recurrence.^[14] However, it takes time to create and suture both anterior and posterior flaps and suturing of posterior flaps is relatively difficult and requires experience due to the narrow surgical field.^[7,10]

In the literature, many studies comparing external DCR performed with only anterior flaps with external DCR performed with antero-posterior flaps have found a high success rate in cases in which sufficient anterior flaps were created. Aslan Bayhan et al.^[15] reported a success rate of 96% in both groups in their study of 108 patients. In a similar study by Serin et al.^[7] no statistically significant difference was found between the group in which only anterior flaps were sutured (93.75%) and the group in which both anterior and posterior flaps were sutured (96.67%) in terms of success and it was emphasized that creating only anterior flaps and excising the posterior flap did not negatively affect the outcome of the surgery but facilitated the surgery. Deka et al.^[16] sutured the anterior flap to the orbicularis muscle in addition to anterior and posterior flap suturing and achieved a success rate of 98.9% in a follow-up of more than one year. Çubuk et al.^[17] compared 156 cases in terms of single flap and double flap and reported that although single flap anastomosis was technically more effortless, it did not adversely affect the success of external DCR operations.

Table 2. Postoperative recurrence rates of the groups

	Anterior flap	Anteroposterior flap	p*
Relapse, n (%)	4 (9.5)	3 (7.5)	1.000
No recurrence, n (%)	38 (90.5)	37 (92.5)	

*: Fisher's exact test

Since only the effect of flap technique on surgical outcome was investigated in our study, cases with complications such as excessive bleeding, mucosal flap loss and punctum injury during the operation were not included in the study because they might affect surgical success. It may be recommended to investigate the complication rates between the two flap techniques and their effects on surgical success with a higher series of cases.

For a successful DCR operation, silicone tube application has been recommended in cases with common canalicular obstruction, fibrotic and small lacrimal sac due to previous dacryocystitis attacks, and in cases where appropriate flap suturing cannot be performed.^[16] In this study, the effect of silicone tube use on surgical success could not be evaluated because it was applied to every patient due to the surgeon's experience and preference, and larger case series are required for this purpose.

CONCLUSION

Consistently with the literature, our study concluded that both anterior and posterior flap anastomosis is not superior to only anterior flap anastomosis. In addition, it is suggested that only anterior flap anastomosis may be preferred because it facilitates the surgery and takes less time.

Disclosures

Ethics Committee Approval: The study was approved by the Kaniuni Sultan Süleyman Training and Research Hospital Clinical Research Ethics Committee (No: 2020.07.145, Date: 23/07/2020).

Authorship Contributions: Concept: Z.K.; Design: Z.K.; Supervision: Z.K., F.E.Ö.; Data Collection or Processing: Z.K.; Analysis or Interpretation: İ.K.; Literature Search: Z.K., F.E.Ö.; Writing: Z.K.; Critical review: Z.K., F.E.Ö., İ.K.

Conflict of Interest: No conflict of interest was declared by the authors.

Informed Consent: Written informed consent was obtained from all patients.

Use of AI for Writing Assistance: Not declared.

Financial Disclosure: The authors declared that this study received no financial support.

Peer-review: Externally peer reviewed.

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