

A Comparative Study of Single Flap versus Double Flap External DacryocystorhinostomyM V D L Satyanarayana¹, M Kiranmai², N Kasturi Bai³, Asma Shaik⁴, M Kavitha⁵, P Sree Kalpana⁶^{1,4}Assistant Professor, Department of Ophthalmology, GMC, Kadapa^{2,3}Associate Professor, Department of Ophthalmology, GMC, Kadapa⁵Post Graduate, Department of Ophthalmology, GMC, Kadapa⁶Post Graduate, Department of Ophthalmology, GMC, Kadapa

Received: 25-05-2024 / Revised: 23-06-2024 / Accepted: 26-07-2024

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Conflict of interest: Nil

Abstract:**Introduction:** Dacryocystorhinostomy (DCR) is a procedure to restore the flow of tears into the nose from the lacrimal sac when the nasolacrimal duct obstructed. This study aimed to compare the success rates of two different techniques in endonasal endoscopic DCR; namely single and double mucosal flap techniques.**Methods:** After getting Institutional Ethical Committee approval, retrospective analysis of records of patients who underwent External DCR for primary nasolacrimal duct (NLD) obstruction was done. Patients were divided into the single-flap technique and the double-flap technique groups. Success was defined as the achievement of patency of the NLD throughout the period of follow-up with significant improvement in epiphora. Time taken for the surgery was analysed.**Results:** The mean age in group A was 50.6 yrs and 51.25 yrs in Group B. The surgical time was 39.7minutes AND 40.5yrs in Group A and Group B respectively. There was no recurrence in any of the cases.**Conclusion:** In our study, there was no difference in surgical success in patients undergoing single and double flap external DCR surgery.**Keywords:** Single Flap, Double Flap, External Dacryocystorhinostomy.This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

Dacryocystorhinostomy (DCR) is a surgical bypass procedure that creates an anastomosis between the lacrimal sac and the nasal mucosa via a bony ostium. It is commonly indicated in cases of nasolacrimal duct (NLD) obstruction. [1] External Dacryocystorhinostomy (DCR) surgery described by Toti in 1904 is the standard surgical method [2]

The surgical procedure in which the front and rear flaps are sutured developed in 1921 by Dupey-Dutemps and Bourget is generally used today. [3]

Although all successful results have been obtained with endonasal DCR in recent years, external DCR is applied as the gold standard due to its success rate of 80-98% (3-14). Different methods of mucosal anastomosis have been used, although the external DCR method of the lacrimal sac and the lower and upper flaps formed from the nasal mucosa is highly successful. This study aimed to

compare the results of single and double flap anastomosis in external DCR operations.

Materials and Methods

We retrospectively analyzed the records of 80 patients who underwent External DCR in our institute from January 2023 to May 2024. The patients were divided into two groups. Group A includes patients with single flap anastomosis. Group B includes cases with double flap anastomosis. Cases of Chronic Dacryocystitis, catarrhal or suppurative infections with epiphora and positive regurgitation and cases of mucocele were included in the study. Cases of Acute dacryocystitis, Secondary Acquired Nasolacrimal Duct Obstruction (SANDO), Failed DCR, Canalicular punctal occlusion, Lower eyelid deformity (entropion, ectropion or lid laxity), Nasal mucosal pathology (atrophic rhinitis, lupus etc.), and Bleeding diathesis were excluded.

Table 1: Demographic Profile

Total No of patients	80
Mean age	50
Gender	
Male	32
Female	48
Laterality	
Right Eye	30
Light Eye	50

Comprehensive examination of each eye, with special reference to examination of lacrimal drainage system [puncta, swelling, tenderness, fistula, regurgitation on pressure over lacrimal sac (ROPLAS)] and eye lids. Fundus examination was performed for both eyes in every case. Lacrimal irrigation was done in all cases. Rhinological check up to rule out gross nasal mucosal pathologies and physician checkup for surgical fitness was obtained in all patients.

Surgical Procedure

Adrenaline sponge was placed in the nasal mucosa, and upper and lower punctum was dilated. Skin and subcutaneous cuts (10-15 mm) were performed at a distance of 7-8 mm from the inner canthus. Skin and subcutaneous wounds started from the upper part of the adhesion of the inner canthal ligament. Blunt dissection was performed, and the periosteum was reached.

The lacrimal sac was isolated from the lacrimal fossa. The periosteum was dissected. The bone window was opened using the Kerrison punch. Shaped flaps were formed from the sac and mucosa. The flaps were mainly kept in single flap patients. A silicone tube was inserted in all the patients and connected in the nose.

The flaps were sutured with 6/0 vicryl and flaps were hanged to the orbicularis muscle with the same suture. Skin and subcutaneous tissue were

sutured with 6/0 vicryl. Systemic antibiotic, nasal decongestant and topical antibiotic + steroid drops were given routinely to all patients in the postoperative period. All operations were finished without complications.

Follow-up examination was scheduled on the first, 7th postoperative day and thereafter 1, 3 and 6 months from day of surgery. Skin sutures were removed on day-7 postoperatively. At each follow-up visit cases were examined for any complications such as wound gap, infection, granuloma formation, discharge, epistaxis etc. The surgical success was defined by anatomical patency of lacrimal drainage system on irrigation at final followup. Blocked syringing was considered as surgical failure.

Results

In the present study, 80 cases of primary acquired nasolacrimal duct obstruction with patent common canaliculus were taken. Divided into two groups, 40 cases with single flap external DCR (group A) and 40 cases with double flap external DCR (group B). There were 60% females and 40 % males, between 20 to 60 years of age with a mean age of Group A were 50.6years and mean Age of Group - B was 51.25years.

The mean surgical time for Group A was 39.7 minutes and 40.5minutes for Group - B. Recurrence was not seen in any of the cases,

**Figure 1:**

Discussion

Epiphora due to the blockage of the lacrimal drainage system and recurrent infection attacks in the sac is both uncomfortable and dangerous for the patient. The treatment aims to create a new path between the lacrimal route and the nasal mucosa.

For this purpose, external DCR is still the most successful method despite new methods such as endonasal DCR, endoscopic DCR, and balloon dacryoplasty. The success rate of external DCR varies between 80% and 99% in different studies [4-14]. Various modifications have been proposed so far. [15-19] Making of large anterior flaps, their suturing and elevating the flaps by passing the sutures through orbicularis instead of double flap anastomosis are some of the modifications, which is quite easy in comparison to double flap suturing.

In our study, the mean age was 50.6yrs in Group A and 51.25yrs for Group B. A similar study done by Cubuk et al had their mean age as 48.2 for Group A and 46.3 for Group B. The mean age in the study done by Damle et al was 52.39 in Group A and 54.73 in Group B.

There was no recurrence in our study whereas recurrence rate of 4.2% was seen in study by Cubuk et al. Recurrence was seen in 2 cases in Group A and 1 case in Group B in the study done by Damle et al. The mean surgical time was 51.43 minutes in Group A and 58.74 minutes in Group B in Damle et al study where as it were 39.7minutes and 40.5minutes for Group A and Group B respectively.

Conclusion

Both single flap and double flap techniques of External Dacryocystorhinostomy are equally effective in the treatment of chronic Dacryocystitis. Operative time taken for single flap technique is less compared to double flap external Dacryocystorhinostomy.

References

- M.J. Ali, M.N. Naik, S.G. Honavar, External dacryocystorhinostomy: tips and tricks, *Oman J. Ophthalmol.* 5 (3) (2012) 191–195.
- Toti A. Novo metodo conservatre di cura radicale dele suppurazioni chroniche del sacco lacrimale (dacriocisto rhinostomia). *Clin Mod Firenze* 1904;10:385-9
- Dupuy-Dutemps L, Bourget J. Procède plastique de dacryocystorhinostomia et ses resultats. *Ann Ocul J* 1921;158:241-61
- Serin D, Alagöz G, Karshioğlu S, Celebi S, Kükner S. External dacryocystorhinostomy: Double-flap anastomosis or excision of posterior flaps? *Ophthal Plast Reconstr Surg* 2007;23 (1):28-31
- Rizvi SA, Sharma SC, Tripathy S, Sharma S. Management of traumatic dacryocystitis and failed dacryocystorhinostomy using silicone lacrimal intubation set. *Indian J Otolaryngol Head Neck Surg* 2011;63(3):264-8
- Deka A, Saikia SP, Bhuyan SK. Combined posterior flap and anterior suspended flap dacryocystorhinostomy: A modification of external dacryocystorhinostomy. *Oman J Ophthalmol* 2010;3(1):18-20
- Bayhan SA, Recep ÖF, Düzen B, Hasripi H. Eksternal dakriosistorinostomi cerrahisinde tek flep ve çift flep sonuçlarımız. *TJO* 2008;38(5):371-4
- Mat E, Okumuş S, Zorlu F, Koçluk Y, Sözen T. Eksternal dakryosistorinostomi ameliyatlarında tek ve çift flep anastomoz sonuçlarının karşılaştırılması *Gaziantep Tıp Derg* 2013;19(1): 40-42
- Kazancı B, Erşan İ. Özek D. Gencer B. Eksternal dakryosistorinostomi: tek veya çift flep anastomozu *Dicle medj* 2013;40(4):601-604
- Haefliger IO, Tschopp M, Pimentel AR. Mucosal excision instead of fashioning nasolacrimal mucosae flaps during external dacryocystorhinostomy: a pilot study. *Klin Monbl Augenheilkd* 2012;229(4):387-90
- Warren JF, Seiff SR, Kavanagh MC. Long-term results of external dacryocystorhinostomy. *Ophthalmic Surg Lasers Imaging* 2005; 36(6):446-50
- Duffy MT. Advances in lacrimal surgery. *Curr Opin Ophthalmol* 2000;11(5):352-6
- Erdöl H, Akyol N, İmamoglu HI, Sözen E. Long term follow up of external dacryocystorhinostomy and the factors affecting its success. *Orbit* 2005;24:99-102
- Bothra N, Wani RM, Ganguly A, Tripathy D, Rath S. Primary nonendoscopic endonasal versus external dacryocystorhinostomy in nasolacrimal duct obstruction in children. *Indian J Ophthalmol.* 2017; 65:1004-1007
- Pico G. A modified technique of external dacryocystorhinostomy. *Am J Ophthalmol.* 1971; 72:679–679.
- Kalef R. Eine vereinfachte modification der dacryocystorhinostomia externa. *Z Augenheilkd.* 1937; 91:140–157.
- Kraupa E. Die totale extirpation des tranensackes von auaen mit wiederherstellung des normalen abflusses in fallen von dakryozystitis. *Z Augenheilkd.* 1921; 46:82–84.
- Rubbrecht R. La dacryo-rhinostomie. *Arch Ophtal.* 1921; 6:165–169. Fazakas A. Neue modification der dacryocystorhinostomia. *Klin Monatsbl Augenheilkd.* 1924; 73:426–430.
- Iliff CE. A simplified dacryocystorhinostomy. *Tr Am Acad Ophthal.* 1954; 58:590–592.

20. Damle V, Agarwal PC. A study to compare outcome of anterior flap suturing versus double flap anastomosis in external dacryocystorhinostomy. *Indian J Clin Exp Ophthalmol* 2020;6(1):80-83
21. Cubuk M, Bardak H, Cetinkaya S, Guvenmez O. Results of Single and Double Flap Anastomosis in External Dacryocystorhinostomy Surgery. *Ulutas Med J.* 2019; 5(2):166-169.