ORIGINAL ARTICLE

TO COMPARE THE SUCCESS RATE OF EXTERNAL DACRYOCYSTORHINOSTOMY WITHOUT AND WITH POSTERIOR MUCOSAL FLAP SUTURING

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Background: This study aims to compare the success rate of external dacryocystorhinostomy (Ex- DCR) without suturing of posterior mucosal flap and with both anterior and posterior mucosal flap suturing. **Methods:** This quasi-experimental study was conducted at a tertiary care hospital from January to December 2023 after ethical board approval. Patients were divided into two groups, A and B, with 50 patients in each. In group A Ex-DCR with suturing of anterior and excision of posterior mucosal flap were included. In group B Ex-DCR with both anterior and posterior mucosal flap suturing were included. Patients followed at one week, 1, 3 and 6 months. Success rate of the procedure was evaluated by symptomatic relief of patients epiphora and patent nasolacrimal passage on syringing after 6 months of DCR. **Results:** Out of 100, 68 were females and 32 males. Mean age was 47.7 and 46.4 years in Group A and B respectively. Watering at presentation was 35 and 32 in Group A and B respectively. Watering with mucous discharge was 15 and18 in Group A and B respectively. The success rate was found as 47 (94%) in group A and 48 (96%) in group B, insignificant statistical difference found between both groups. **Conclusions**: Our study showed comparable success rate of Ex-DCR between both suturing techniques in which anterior and posterior flap suturing group and with anterior flap suturing and excision of posterior flap group.

Keywords: External dacryocystorhinostomy; Posterior mucosal flaps; Suturing

Citation: Rasheed R, Kamil Z, Wasim S, Naz S, Hassan T, Naz U. To compare the success rate of external dacryocystorhinostomy without and with posterior mucosal flap suturing. J Ayub Med Coll Abbottabad 2026;38(1):50–3.

DOI: 10.55519/JAMC-01-13156

INTRODUCTION

Nasolacrimal duct obstruction (NLDO), a blockage of the tear drainage system, is the disorder most frequently encountered in the oculoplastic department. It is categorized into primary idiopathic or secondary caused by other local or systemic conditions including inflammation, infection, trauma, neoplasia and mechanical.1 Annual incidence rate of NLDO found to be 20.24 people per 100,000 with a higher prevalence among older people and women.[2]

Epiphora, an excess of tears caused by an imbalance between tear production and drainage, is a very common presenting complaint in nasolacrimal duct stenosis and obstruction[3] also with recurrent episodes of acute dacryocystitis.[4]

Dacryocystitis is characterized by inflammation of the lacrimal sac at medial canthus or at the junction of nasolacrimal sac and duct leading to obstruction of tear drainage system. It can present with acute or chronic presentation.[5] Acute episode of dacryocystitis present with sudden onset of pain, tender, erythematous swelling over the lacrimal sac area and medial canthal region with purulent discharge.[6] The acute form is treated with local and systemic antibiotics.[7] Chronic dacryocystitis presents with epiphora, recurrent episodes of dacryocystitis, mucous discharge[8] with swelling over the sac, pus regurgitates through punctum when finger pressure is applied directly over the sac[6].

Management of NLDO and recurrent episodes of dacryocystitis is dacryocystorhinostomy (DCR), it is the gold standard technique for the treatment of acquired distal lacrimal disease leading to obstruction except carcinoma.[9] It is performed through an external or endonasal approach.[4]

External-approach dacryocystorhinostomy (Ex-DCR) was first described in the early twentieth century by the Florentine otolaryngologist Addeo Toti, and was later modified by Bourguet and Dupuy-Dutemps.[2]

Ex-DCR is the surgical procedure used to create osteotomy to form anastomosis between the upper part of the nasolacrimal duct with nasal cavity with formation of flap between which allows drainage of fluid by bypassing the obstruction.[10] It is the commonest procedure performed by oculoplastic surgeons, and its success rate is >95%.[11] Other studies showing success rate of 80–99%.[12] The aim of this study was to evaluate the outcomes of the external DCR without suturing posterior flap and with both anterior and posterior mucosal flaps suturing.

MATERIAL AND METHODS

This quasi-experimental study was conducted at a tertiary teaching eye care hospital from January 2023 to December 2023 after review and approval from the research ethical board of the hospital.

One hundred patients were included in our study and followed after informed consent who presented to the oculoplastic department with epiphora due to nasolacrimal duct obstruction, confirmed by the regurgitation test and syringing and probing. Patients were divided into two groups according to inclusion criteria comprising 18–65 years of age, either gender, chronic dacryocystitis and complete nasolacrimal duct obstruction and and exclusion criteria comprising canalicular block, a history of acute dacryocystitis, trauma or tumour of lacrimal system.

Sample size was calculated using WHO single-proportion formula, $n = Z^2P(1-P)/d^2$, with P = 0.95 and d = ±6%, which gives 50 patients per group. The patients were allocated to the groups consecutively. Group A had 50 patients who underwent external DCR procedure with anterior flap sutured only and without suturing of posterior mucosal flap. Group B included 50 patients who underwent external DCR procedure in which both anterior and posterior flaps were sutured.

Procedure was done by single surgeon. Ipsilateral nasal packing was done with lignocaine jelly 2% and adrenaline-soaked gauze. Local anaesthesia of lidocaine 2% along with adrenaline 1:100,000 was injected beneath the incision site along with nose and second peribulbar block at supraorbital notch medially. The upper and lower puncta were dilated and the patient was positioned in the reverse Trendelenburg position.

Vertical incision of 8–9 mm in length with 15 blade scalpel was given around 10–12 mm medial to medial canthus above the medial canthal tendon (MCT) level avoiding angular vein bleeding.

Skin and orbicularis muscle were raised medially and laterally with four-sided traction sutures with silk 4-0. Orbicularis fibres were bluntly dissected up to periosteum of anterior lacrimal crest, medial palpebral ligament was disinserted from the exposed anterior lacrimal crest, periosteum was separated and incised with entire length with a periosteum elevator. The periorbita and lacrimal sac on exposing were elevated off the lacrimal sac fossa. An osteotomy in the lateral nasal wall was created by perforating thin bone of lamina papyracea to create a potential space of ostium up to the size of tip of index finger size and the nasal mucosa is exposed. Then fashioning of first sac flaps followed by mucosal flap were formed. Punctum dilator was used to dilate punctum then Bowman's probe was passed through upper punctum into lacrimal sac to tent it medially then with the 11 no blade "H"-shape incisions was made in lacrimal sac and mucosa respectively to create anterior and posterior flaps. A silicone tube was then intubated.

Those in which anterior flaps were sutured and posterior flaps were excised were included in group A. while those in which anterior and posterior flaps both were sutured included in group B. The anterior flap was sutured with 6-0 Vicryl. Interrupted 6-0 Prolene sutures were used to close the muscle, followed by subcutaneous suturing for skin closure. Antibiotic eye ointment was applied and the wound was patched. Topical and oral antibiotics were prescribed. The nasal pack was removed after 24 hours. Patients were followed up in the oculoplastic OPD at 1 week, 1 month, 3 months, and 6 months of surgery. The silicone tube was removed after 6 months. Success rate of our procedure was evaluated by symptomatic relief of patients epiphora and patent nasolacrimal passage on syringing after 6 months of Ex-DCR.

SPSS Version 25.0 was used for statistical analysis. Mean and standard deviation was calculated for quantitative variables for both groups like age. Frequency and percentages were calculated for qualitative variables for both groups like age, gender, laterality of eye, presenting complaints, complication and success rate. Chi square test was applied to compare the success rate between groups. The Student t-test was applied to compare mean differences between groups. A *p*-value of <0.05 was considered statistically significant.

RESULTS

We enrolled one hundred patients in our study in which majority of the patients were presented with age more than 45 years, as presented in Figure-1. Two distinct methods were used to carry out the external DCR procedure. The mean age of the patients was found as 47.7±9.1 years in Group A and 46.4±7.7 years in Group B, which was statistically insignificant (p=0.452). Most of the patients were females in our study. The ratio of male to female was 1:2. The age group was distributed as 13 (26%) in group A and 17 (34%) in group B who had age <45 years while 37 (74%) in group A and 33 (66%) in group B who had age ≥45 years. According to gender group A had 14 (28%) males and 36 (72%) females while group B had 18 (36%) males and 32 (64%) females. We found insignificant association of age group (p=0.383) and gender (p=0.391) with the techniques. The laterality of eye for the external DCR procedure in group A was contributed as, 19 (38%) in right eye and 31 (62%) in left eye. The laterality of eye for the external DCR procedure in group B was contributed as, 23 (46%) in right eye and 27 (54%) in left eye. Watering from the eye at presentation was present in 35 (70%) patients in group A and 32 (64%) patients in group B. Watering with mucous discharge was the presenting complaint in 15 (30%) patients in group A and 18 (36%) in group

B (Figure-2). Presenting complaints were also insignificantly associated with both the techniques (p=0.523). The complication rate was found as 15 (30%) in group A while 16 (32%) in group B. Out of 15 complications in group A, bleeding from the eye and laceration of the nasal mucosa occurred in 8 (53.3%) and 7 (46.7%) respectively. Out of 16 complications in group B, bleeding from the eye and laceration of the nasal mucosa occurred in 9 (56.3%) and 7 (43.8%) respectively. Intraoperative complications were also insignificantly associated with both the techniques (p=0.870). The detailed association of different characteristics of eye with both techniques are presented in Table-1. In our study of DCR surgery, both techniques showed statistically insignificant success rate (p=1.000). Chi-square test was used to compare the success rate between both groups. The success rate was found as 47(94%) in cases of group A and 48 (96%) in cases of group B. The association of success rate with both techniques is presented in Table-2.

Table-1: Association of different characteristics with techniques

	Group A	Group B	*p*-value
Age in years	47.7±9.1	46.4±7.7	0.452
Age group			
<45 years	13(26)	17(34)	0.383
≥45 years	37(74)	33(66)	
Gender			
Male	14(28)	18(36)	0.391
Female	36(72)	32(64)	
Laterality of eye			
Right	19(38)	23(46)	0.418
Left	31(62)	27(54)	
Intraoperative complications			
Bleeding	8(53.3)	9(56.3)	0.870
Laceration of Nasal Mucosa	7(46.7)	7(43.8)	

Student t-test and chi-square test applied. *p<0.05 is statistically significant

Table-2: Comparison of success rate in both techniques

Success Rate	Group A	Group B	*p*value
Successful	47(94)	48(96)	1.000
Failed	3(6)	2(4)	

Chi square test is applied, *p<0.05 is statistically significant

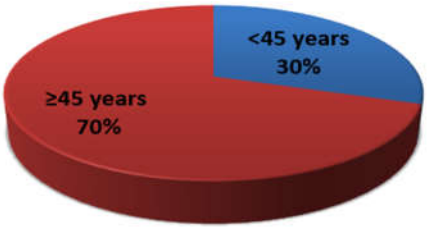

Figure-1: Distribution of age group

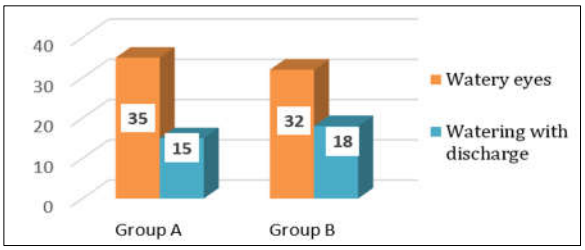

Figure-2: Presenting Complaints

DISCUSSION

External dacryocystorhinostomy (DCR) in one of the most successful treatment methods for patients with the complain of epiphora due to chronic dacryocystitis or nasolacrimal duct obstruction,13 despite newer treatment options for epiphora including balloon dacryoplasty, endonasal DCR and endoscopic DCR. Our study was conducted to compare overall success rates of external dacryocystorhinostomy with two different flap suturing techniques. In group A of flap suturing technique in which anterior flaps was suture while the posterior flaps were excised, while in other group B, flap suturing technique both anterior and posterior flaps were sutured. Suturing of posterior flap is difficult step and more surgical expertise is required to suture the flap, so excising the posterior flap and anastomosing the anterior flap is easier than anastomosing both. However, anastomosing both flaps take more time but it increases the chance of patency by healing the pathway and reducing mucosal scarring while suturing of single anterior flap increase the chance of shrinkage of the pathway. Our study showed mean age in group A is 47.7±9.1 years and in group B is 46.4±7.7 years with female predominance in both group 36 and 32 as compare to male 14 and 18 respectively. The bleeding complication was little bit more seen in group B 9 cases then in group A found in 8 cases with mucosal laceration cases were cases reported were 7 in each group. Over all insignificant difference in the success rate was found between both of the flap suturing techniques. Our results are supported by the study of Cubuk et al., which showed a similar success rate in the double flap group patients in which both anterior and posterior mucosal flap were anastomosed 96.6% and in which only anterior mucosal flap was anastomosed were single flap group patients was 95.8%. mean age was 48.2±16 years in double flap group and 46.3±17 years in single flap group. More female than male patients presented in both groups (92 versus 64).[14] Takahashi et al. reported similar results in both surgical groups including double-flap anastomosis 93.0% and in which no flap group anastomosis done 93.2%.[15] Further comparative studies have shown no significant difference with similar success rate between both suturing techniques in procedure of external DCR.[10,16,17]

While there are few studies that showed more success with single mucosal flap suturing Khan et al. reported a greater success rate of 98% in patients with only anterior flaps were sutured and posterior flaps was excised, as compare to 84% in patients with both anterior and posterior flaps were sutured.[12] Serin et al. likewise showed no advantage of double-flap group anastomosis over only anterior flaps anastomosis, with success rate in both groups A and B that was 93.75% and 96.67%, respectively.[18] Elwan reported a greater success rate of 90% with excision of posterior flaps and 85% success rate with suturing of posterior flaps.[19]

CONCLUSIONS

Our study concluded comparable success rate of External DCR between both anterior and posterior mucosal flap suturing group and with anterior flap and without posterior mucosal flap suturing group, Either flap suturing technique may therefore be chosen at the time of surgery. The single anterior flap technique is simpler, quicker and easier to construct, and the choice does not appear to influence the outcome of external DCR.

Financial disclosure: None
Conflict of interest: None

AUTHORS' CONTRIBUTION

RR: Concept, data collection. ZK, SW, SN: Literature search, data analysis, interpretation, write-up. TH: Proof reading. UN: Data collection.

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Submitted: March 26, 2024	*Revised: May 11, 2025*	*Accepted: May 21, 2025*

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