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The success rate of external dacryocystorhinostomy with and without suturing the posterior mucosal flaps

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ABSTRACT

BACKGROUND: The aim of this prospective study was to compare the success rate of external dacryocystorhinostomy (DCR) with and without suturing the posterior mucosal flaps.

MATERIAL AND METHODS: One hundred patients who underwent external DCR surgery were included in this study. They were divided into group A and group B, with 50 patients in each group. In group A, patients who underwent an external DCR with only anterior flaps sutured and removal of posterior flaps were included. In group B, patients who underwent an external DCR with both anterior and posterior flaps sutured were included. All patients came for a follow-up visit at one week, one month, three months, and at six months. The success rate was evaluated by symptomatic relief from epiphora and patency on syringing performed at the follow-up six months after DCR. To evaluate differences in both groups, a Chi-square test was used. A p-value less than 0.05 was considered statistically significant.

RESULTS: The success rate was 98% in group A, and 84% in group B. Our results show the success rate was higher in group A where anterior flaps were sutured, and posterior flaps were excised. The difference was statistically significant (p-value < 0.05)

CONCLUSIONS: This study shows that DCR surgery with anterior flaps anastomosis and excision of posterior flaps has a higher success rate than anterior and posterior flaps anastomosis.

KEY WORDS: anterior and posterior flaps; dacryocystorhinostomy; DCR; epiphora; syringing

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INTRODUCTION

Dacryocystitis is defined as an inflammation of the lacrimal sac. Dacryocystitis may be classified as acute, subacute, or chronic. It may be localized in the sac, extend to include a pericystitis, or progress to orbital cellulitis. When dacryocystitis is localized to the sac, a palpable painful mass occurs at the inner canthus, and obstruction is present at the junction of the nasolacrimal sac and duct. Obstruction of lacrimal passage is a common cause of chronic dacryocystitis. It may occur at the junction of a lacrimal sac or nasolacrimal duct [1]. Clinical features of acute dacryocystitis are sudden onset of pain, erythema, and edema in the lacrimal sac area. Tenderness in the medial canthal region and epiphora are also present. Chronic dacryocystitis is more common. It is characterized by epiphora [2], aggravated by such conditions as exposure to wind. There may be a swelling at the site of the sac (mucocele) and the caruncle. The adjacent parts of the conjunctiva are frequently inflamed. On pressure over the sac, mucopus or pus regurgitates through the puncta or more rarely passes down into the nose.

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External DCR is a procedure of choice in nasolacrimal duct obstruction with a success rate of 85–97% [3]. Dacryocystorhinostomy is a surgical procedure in which a lacrimal sac is drained into the nose [4]. Toti's [5] classic transcutaneous technique has undergone many minor modifications, but the basic operation has withstood the test of time and has a high success rate of 93–95% [6]. It may be performed with the patient under general or local anesthesia [7]. The use of mitomycin-C — a chemotherapeutic agent — can increase the success rate of the DCR procedure [8].

MATERIAL AND METHODS

This study was conducted at the Department of Ophthalmology JNUIMSRC Jaipur, India, from March 2018 to March 2020. Appropriate written consent was obtained from patients. The study was conducted after approval from the institutional ethics committee. One hundred patients were included in our study and followed. Patients were divided into group A and group B, with 50 subjects in each group. Group A included patients who underwent external DCR with only anterior flaps sutured and removal of posterior flaps. Group B included patients who underwent external DCR with both anterior and posterior flaps sutured.

Inclusion criteria were: chronic dacryocystitis, age between 18 to 60 years, and complete nasolacrimal duct obstruction.

Exclusion criteria were: canalicular block and any bony deformity.

All patients were carefully examined. Regurgitation test and syringing were done. Systemic history was obtained regarding asthma, hypertension, ischemic heart disease, diabetes mellitus, bleeding disorders, use of acetylsalicylic acid and antiplatelet drugs. A routine tests: complete blood count, random blood sugar, urine routine, an electrocardiogram (ECG), bleeding time (BT), clotting time (CT), and all the investigations required for a pre-anesthetic check-up, were done. Written informed consent was obtained from the patients. The same surgeon operated on all the cases.

Before the DCR surgery, the nasal packing was carried out in the ipsilateral nostril. Lignocaine jelly (4%) was instilled, followed by gauze soaked in 2% lignocaine jelly with adrenaline. Surgery was performed under a block. Local infiltration of anaesthesia consisted of a 2% lidocaine injection with 1:100,000 adrenaline, approximately 7 mL, out of which around 4 mL was injected on the flat side of the nose beneath the incision site in addition to the second peribulbar block given medially at the supraorbital notch. The straight incision was performed 10 to 12 mm medial to the medial canthus, approximately 8–9 mm in length with taking care of the angular vein. During dissection of the orbicularis fibres till the level of the anterior lacrimal crest, when medial palpebral ligament is exposed, it should not be cut. It should be disinserted from the exposed anterior lacrimal crest. With the anterior lacrimal crest exposed, the next step was to separate the periosteum along the incision's entire length with a periosteum elevator. The lacrimal sac on exposing was retracted with a periosteum elevator to avoid being damaged during the procedure. With the periosteum separated, the lamina papyracea (a thin friable bone) was exposed, then punctured. The ruptured papyracea created a potential space to engage the repeated bone punch for performing an ostium. The size of the ostium should be the size of the tip of the index finger. Then the surgeon performed the fashioning of the sac and mucosal flaps. It's always advisable to fashion the sac flap before the mucosal flap as the mucosa is densely vascularized, which might cause a gush of bleeding, making the procedure more cumbersome. A Bowman's probe or lacrimal cannula was passed through the upper punctum after dilating the punctum with a punctum dilator. The probe or cannula helps identify the sac, many surgeons use dye or viscoelastic substance, but this method solves the problem equally well. "H"-shape incisons were made in the sac and mucosa respectively creating anterior and posterior flaps.

In our study, in group A, anterior flaps were sutured, and posterior flaps were excised. In group B, both anterior and posterior flaps were sutured. Flaps were sutured with 6'0 polyglactin 910 (Vicryl) sutures. Muscle closure with 6'0 sutures with approximately 4–5 interrupted sutures followed by skin closure with subcutaneous suturing with 6'0 sutures and securing the suture's ends with micropore, and patching up the incision site with antibiotic eye ointment. The nasal pack was removed after 24 hours. Postoperative topical and oral antibiotics were given.

All patients came for follow-up one week, one month, three months, and six months after surgery. The success rate was evaluated by symptomatic relief from epiphora and patency on syringing performed 6 months after DCR.

SPSS version 16.0 statistical software was used to perform statistical analysis. A Chi-square test was used to evaluate differences in both groups. A p-value less than 0.05 is considered statistically significant.

RESULTS

In our study, 100 cases (72 females, 28 males) were included according to the inclusion criteria. The external DCR operation was performed with two different techniques. In group A, only anterior flaps were sutured, and posterior flaps were excised. In group B, anterior and posterior flaps were sutured. Group A consisted of 13 males (26%) and 37 females (74%), while group B included 15 males (30%) and 35 females (70%) (Tab. 1). The male to female ratio was 1:2.57. Watering from the eye was present in 42 patients in group A and 40 patients in group B. Watering with mucous flakes were observed in eight patients in group A and ten patients in group B (Tab. 2). In group A, an intraoperative complication was bleeding in four patients and the nasal mucosa's laceration in three patients. In group B, bleeding was present in five patients and laceration of nasal mucosa in four patients (Tab. 3). On the basis of symptomatic relief and syringing performed during the follow-up visit scheduled six months after the DCR procedure, the surgery was successful in 49 patients in group A and 42 patients in group B. The chi-square test was applied to compare the success rate in group A and group B. P-value less than 0.05 was considered significant. The success rate of DCR surgery in group A was 98% and 84% in group B, which was statistically significant (p 0.036) (Tab. 4).

DISCUSSION

The aim of our study was to compare the results of two different techniques of external DCR. In group A, only anterior flaps were sutured, and posterior flaps were excised. In group B, both anterior and posterior flaps were sutured.

Our results were similar to those obtained by Kacaniku et al. [9], where group A consisted of 76% females and 24% males, while in group B 71% were females and 29% males. Authors reported a success rate of 96.2% in patients where the posterior flap was excised and only anterior flap was sutured and 94.4% in patients where both anterior and posterior flaps were sutured. Intraoperative bleeding was observed in 9.3% of patients in group A and 5.8% of patients in group B. Laceration of nasal mucosa in group A 5.5% and in group B 3.8%.

Similar results were also obtained by Khan et al. [10]. Their study group included 71% females and 29% males. The male to female ratio was

Table 1. Gender wise distribution of patients operated for external dacryocystorhinostomy (DCR)

	Group A	Group B	Total
Male	13	15	28 (28%)
Female	37	35	72 (72%)
Total	50	50	100

Table 2. Presenting complaints in group A and group B

Presenting complaints	Group A	Group B	Total
Watering eyes	42	40	82
Watering with discharge	8	10	18
	50	50	100

Table 3. Intraoperative complications

Complications	Group A	Group B	Total
Bleeding	4	5	9 (9)%
Laceration of nasal mucosa	3	4	7 (7%)

p-value 0.66 (not significant as p value is more than 0.05)

Table 4. The success rate in group A and group B			
Result	**Group A**	**Group B**	**Total**
Successful DCR	49	42	91
Failed DCR	1	8	9
Total	50	50	100

p-value 0.036 (significant as value is less than 0.05); In group A only anterior flaps were sutured and posterior flaps were excised and in group B both anterior and posterior flaps were sutured

1:2.5. In group A 42 patients (84%) and in group B 40 (80%) patients were complaining of watering eyes. Authors reported epiphora 78.6% in the study population. Intraoperative bleeding was observed in 4 (8%) patients in group A, and 5 (10%) patients in group B. Laceration of nasal mucosa in group A was observed in 3 (6%) patients, and in group B — in 4 (8%) patients. The success rate in group A, where only anterior flaps were sutured and posterior flaps were excised, was 98%, and in group B, where both anterior and posterior flaps were sutured, it was 84%.

In other studies, Serin et al. [11] reported a success rate of 96.67% in patients with posterior flap excised and 93.75% in patients with both anterior and posterior flaps sutured. Elwan [12] reported a 90% success rate with excision of posterior flaps and 85% success rate with suturing of posterior flaps.

CONCLUSIONS

This study shows that DCR surgery with anterior flaps anastomosis and excision of posterior flaps has a higher success rate than anterior and posterior both flaps anastomosis.

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Conflicting interests

The authors declare that there is no conflict of interest.

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