A MODIFIED TECHNIQUE OF EXTERNAL DACRYOCYSTORHINOSTOMY

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ABSTRACT

Chronic dacryocystitis usually occurs due to the obstruction of lacrimal passage at the junction of the lacrimal sac and nasolacrimal duct. The reconstruction of lacrimal passages in such cases can be achieved by several surgical techniques. We present a modified technique of external Dacryocystorhinostomy (DCR) by suturing of anterior flaps and excision of the posterior flaps of the lacrimal sac and nasal mucosa and intubation. To present the outcome of the modified technique of external DCR with anterior flap anastomosis, excision of posterior flaps and intubation. The study included 30 patients with nasolacrimal duct obstruction who underwent the modified technique of external DCR with anastomosis of anterior flaps only, whereas the posterior flaps were excised. The success rate and complications were recorded over a follow-up period of 6 months. In this study there was a female preponderance with a male:female ratio of 1:2.75 The success rate of this modified technique was found to be 93.3%. Intraoperative complications were bleeding in 13.3% and laceration of the nasal mucosa in 3.3% cases. Two patients had failed DCR after 12 months. In 1 cases, the obstruction of the bony ostium by granulation tissue and in one case, the sump syndrome was the cause of failure of DCR. This modified technique of external DCR only simplifies the surgical procedure without compromising efficacy or safety of the procedure. Anterior flap DCR is a safe, easy to master and effective surgical procedure.

KEY WORDS: Chronic dacryocystitis, Dacryocystorhinostomy, Nasolacrimal duct obstruction.

INTRODUCTION

Watering of the eye due to obstruction of the nasolacrimal duct is called epiphora. It is a common problem, about 33% of the complaints in routine ophthalmological practice⁽¹⁾. Tears are secreted by the lacrimal gland with secretory volume of approximately 10ml/day⁽²⁾. Tears pass from the lacrimal lake into the canaliculi through the upper and lower lacrimal puncta. When the eyelids are closed the two puncta come in contact with each other and become physiologically occluded when the lids open capillary action draw the tears into the empty canaliculi. Tears then flow into the common canaliculi and lacrimal sac, then directed into the inferior meatus of the nose. Valves within the lacrimal pathway allow only the unidirectional flow of tears, i.e., toward the inferior meatus of the nose through the valve of hasner.

The obstruction of nasolacrimal duct causes stasis of the sac contents. This vicious cycle of stasis and infection causes dacryocystitis. Persistent tearing, mucopurulent discharge expressed through the puncta while pressing on the lacrimal area, chronic conjunctivitis, and swelling of the lacrimal sac in the medial canthal area are the symptoms of nasolacrimal duct obstruction leading to acute or chronic dacryocystitis^(2,3).

The principle of DCR is the removal of bone lying between the lacrimal sac and the nasal mucosa, and making an anastomosis between the medial wall of the sac and nasal mucosa.

In 1904 Toti⁽⁴⁾ a French Ophthalmologists first described the technique of external DCR. In his classical method, lacrimal sac was exposed through an

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external skin incision, a lacrimal fossa rhinostomy was performed, the nasal mucosa and the medial portion of the lacrimal flap excised, and the wound closed with skin sutures. The more advanced methods that appeared to be very successful were described by Dupuy-Dutemps and Bourguet⁽⁵⁾ in 1921. In this procedure, both anterior and posterior flaps were formed and then anastomosed with nasal mucosa. Older⁽⁶⁾ introduced the use of silicon tube in external DCR.

Numerous modifications have been described for dacryocystorhinostomy, but the basic procedure remains to has a high success rate of 93-95%⁽⁷⁾. Failure of external DCR has been attributed to many factors. The important factors responsible for failure are granulation tissues from the nasal mucosa closing the rhinostomy, small size of the ostium, inadequate size and fashioning of anastomosis flaps leading to kinking of the canaliculi, sagging of the anterior flaps, partial thickness lacrimal sac flaps, and postoperative soft tissue infection^(8,9).

The success of DCR depends on the adequate anatomical exposure of the deeply seated lacrimal sac to obtain a good anastomosis of the flaps and a proper sized ostium. Due to a difficult and narrow surgical field and presence of intraoperative bleeding, handling of flaps particularly posterior flaps becomes very difficult for the surgeon.

Keeping in mind, the above mentioned factors in our study, we tried a simple and easy form of external DCR with suturing of anterior flaps only with the excision of the posterior flaps along with silicon tube intubation of the fistula for 3-6 months.

MATERIALS AND METHODS

This prospective study was carried out between 2008 and 2015 in Misurata central Hospital and Alhilal

Hospital, all the cases were operated by the same surgeon. Thirty adult patients >20 years of age with the primary nasolacrimal duct obstruction were included in this study. The exclusion criteria included patients who had canalicular and punctal occlusion, lower eyelid deformity, nasal mucosal pathology, bleeding diathesis, and trauma with facial fractures. Complete history was taken in every case and a thorough clinical examination was done which included the anterior segment examination under slit lamp biomicroscope of each eye and examination of the lacrimal drainage system. Preoperatively, lacrimal sac syringing was done in all cases. A thorough rhinological checkup was done in all cases to exclude the grossly deviated nasal septum, nasal polyps, hypertrophied turbinate and atrophic rhinitis. All routine investigations including haemogram, bleeding time, and clotting time were done. The local antibiotics were started a week before surgery. Nasal decongestants were started 24 h prior to the surgery. A written consent were obtained from all patients.

Modified procedure of external DCR was created by suturing anterior flaps of the lacrimal sac and the nasal mucosa, whereas posterior flaps were excised and silicon tube intubation was done.

Follow-up examinations were done on 1st postoperative day, 7th post-operative day, 1 month, 3 months, 6 months, 9th month, and 12th month. Probing and syringing were attempted if epiphora occurred post-operatively. Absence of epiphora at the end of 1 year follow-up without the need for further surgical intervention was considered a success.

RESULTS

In this study 22 (73.3%) patients were females and eight (26.6%) were males. There was a female preponderance noted in our study with a male:female ratio of 1:2.75. Ninety percent of the patients were between the ages of 20-50 years (Table 1).

(Table 1) Study group.

Age group in years	Male	Female	Total (%)
20-30	1	4	5 (16.7%)
31-40	4	8	12 (40.0%)
41-50	2	8	10 (33.3%)
51-60	1	2	3(10.0%)
Total	8(26.6%)	22(73.3 %)	30 (100%)

Intraoperative and post-operative complications are shown in (Tables 2 and 3), respectively.

(Table 2) intraoperative complication
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Complication	No. of patients	Percentage
Bleeding	4	13.3
Laceration of nasal mucosa	1	3.3

(Table 3)	postoperative	complications.
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(Tuble c) postoperative complications		
Complication	No. of patients	Percentage
Epistaxis	2	6.66%
Wound sepsis	1	3.33%
Sinusitis	1	3.33%
Epiphora	2	6.66%
Mucopurullent discharge	1	3.33%
Hypertrophic scar	1	3.33%

The source of bleeding was nasal mucosa in two cases and in another two cases, the angular vein was ruptured. There was no case of orbital hemorrhage, orbital emphysema nor cerebrospinal fluid leakage in our study. The success rate of this technique was 93.3%. Of the two patients with failed DCR, one had granulation tissue blocking the rhinostomy site, whereas in one patient sump syndrome was the cause (Table 4).

(Table 4) Causes of failure of DCR.

Cause of failure	No. of patients	
Ostium closure	1	
Sump syndrom	1	

DISCUSSION

The reported success rate of external DCR varies between 85% and $100\%^{(10-12)}$. In recent years, endonasal DCR and endolaser DCR has been gaining in popularity over the traditional DCR owing to the advantages of no scar, less tissue damage, and less intraoperative time^(13,14). However, these procedures have their own limitations, endonasal laser DCR has a long term success rate of 79%⁽¹⁴⁾ and is difficult to perform in the presence of altered bony anatomy in the region or after trauma⁽¹⁴⁾. The external DCR is a highly successful procedure⁽¹⁰⁻¹²⁾, however, the surgical procedure is not technically easy and requires considerable experience as well as operative time. Due to the inaccessibility through a difficult anatomical terrain and a constrained surgical field, the handling of posterior flaps in a double flap surgery becomes very difficult. To add the level of difficulty, intraoperative hemorrhage makes suturing of the posterior flaps a very strenuous job. For beginners who are starting to learn DCR meticulous handling of posterior flaps is again a difficult job. Keeping in mind the above-mentioned factors, we hereby present a simplified way of doing DCR with anastomosis of anterior flaps along with excision of posterior flaps. This technique is a common variation of the traditional external DCR. The age and gender distribution of our patients generally complies with figure in literatures^(11,15,16).

Of the 30 patients 22 (73.3%) were females and eight (26.6%) were males.

The male to female ratio was found to be 1:2.75, Zaman *et al*⁽¹⁷⁾. Stated that the narrow lacrimal fossa in females predisposes them to the obstruction by sloughed off debris, due to the hormonal changes that bring about a generalized deepithelization. In our study, only 2 (6.66%) patients out of 30 patients had epiphora and discharge 6 months post-operatively, all other patients were symptom-free. This reflected a success rate of 93.3% which compares favorably with other studies using different flap technique designs^(10,11,12,15,16). A study by Elwan¹¹ reported a success rate of 90% with excision of posterior flap and 85% with suturing, he concluded that excision of the posterior flaps of lacrimal sac may improve the success rate. A study by Zaman et al(17). reported a success rate of 98.33% by suturing only the anterior flap and engaging them in the muscle layer. Baldeshi et al⁽¹⁰⁾. Anastomosed anterior flap, did not suture the posterior flap, and reported a success rate of 100%. Serine *et al*⁽¹⁸⁾. Reported that with posterior flap anas-</sup> tomosis, 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. In our study, the silicon tube intubation was done in every patient. Hussein *et al*⁽¹⁹⁾. Did a comparative study and found a success rate of 94.7% in intubated cases against a success rate of 77.8% in non-intubated cases, similarly Advani et $al^{(20)}$. Also found a success rate of 95% in intubated cases and 88% in non-intubated cases. From this, we can conclude that the silicon tube intubation is a useful adjunctive procedure in DCR, which increases the chances of success. This may have been one of the reasons for a high success rate of 93.3% obtained in our study. Intraoperative complications encountered were bleeding in four patients (13.3%). The source of bleeding was nasal mucosa in two cases and in two cases, the angular vein was ruptured.

Post-opertively, we encountered the epistaxis in two patients (6.66%) which required nasal packing. wound sepsis was seen in one patients who were treated with antiseptic dressing along with betadine and systemic antibiotics. Sinusitis which developed post-operatively was seen in one patients (3.33%) epiphora with mucopurulent discharge (failed DCR) occurred in two patients (6.66%). The cause of failure was granulation tissue blocking the rhinostomy site in one cases and one patient developed sump syndrome. These complication rates are similar to other studies⁽²¹⁾.

CONCLUSION

The future of lacrimal surgery is changing with the introduction of endoscopes and lasers, but the external DCR still remains the gold standard for lacrimal surgery. This modified technique of external DCR only simplifies the surgical procedure without affecting its reliability or complication rates. It is particularly helpful for beginners who are starting to do lacrimal surgery. This study adds to the usefulness of modified anterior flap DCR technique. This study concludes that suturing of anterior flaps with excision of posterior flaps along with the silicone tube intubation is a successful procedure.

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