

Original Research Article

A study of clinical profile of patients undergoing endonasal endoscopic dacryocystorhinostomy without stenting in a teaching hospital of Western Gujarat

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ABSTRACT

Background: Chronic dacryocystitis is commonly treated with dacryocystorhinostomy (DCR). The aim of the study was to analyze the clinical profile of patients suffering from distal Nasolacrimal duct (NLD) blockage and outcomes of EnDCR without stenting in patients with chronic dacryocystitis.

Methods: This prospective observational study consisted of 50 patients who underwent EnDCR without stenting at ENT department of Gujarat Adani Institute of Medical Sciences during the period of October 2019 to September 2021, after taking IEC consent. All patients with distal NLD blockage were included in study. Pre-operative, intra-operative and post-operative details were recorded as per pre-validated proforma and data was analyzed using Microsoft excel sheets.

Results: Watery discharge from eye was most common chief complaint (76%) during presentation followed by watery discharge and swelling over medial end of eye both (20%) and swelling over medial end of one eye (4%). Most common duration of chief complaint was between 3 to 12 months. In our study, out of 50 patients, 31 cases were operated under local anesthesia and 19 were operated under general anesthesia. Out of 50 operated cases, only 3 patients had stenosis of ostium at 3-month follow-up. Overall success rate of endoscopic endonasal DCR without stenting was 94%.

Conclusions: The success rate of endonasal dacryocystorhinostomy without stenting is as high as that of external dacryocystorhinostomy and endonasal DCR with stenting without the disadvantages of either one.

Keywords: Chronic dacryocystitis, DCR, Endoscopic DCR

INTRODUCTION

Epiphora is defined as the overflow of tears. The degree of epiphora can range from the occasionally bothersome trickle to the chronically irritating overflow, which could be a source of social embarrassment. Acquired Nasolacrimal duct (NLD) obstruction can be classified into primary and secondary. Primary NLD obstruction is caused by inflammation and fibrosis without any precipitating cause.¹ Primary NLD obstruction is more common in middle-aged and elderly women. It has been demonstrated that women have significantly smaller

dimensions in the lower nasolacrimal fossa and middle NLD.² Chronic dacryocystitis is commonly treated with Dacryocystorhinostomy (DCR). The surgical procedure of diversion of lacrimal flow within nasal cavity through an artificial fistula made at the level of lacrimal sac is called dacryocystorhinostomy. Recently, after the advent of endoscopes, endoscopic endonasal DCR has gained popularity. This is largely due to well illuminated panoramic view of endoscopes, high digital quality imaging and technical advances in the rhinologic instrumentations. The first intranasal DCR was described by Caldwell in 1893.³ In 1989 McDonogh and Meiring

described the endoscopic trans nasal DCR.⁴ Recently, Lasers have been used for EnDCR; like holmium Yttrium aluminum garnet (YAG), argon, carbon dioxide and potassium titanyl phosphate laser. A transcanalicular approach with the neodymium doped YAG laser has also been described.⁵ Our institute serves a large population from socio economically lower class in western part of Gujarat. EnDCR is performed without stenting. It is not only simpler than other techniques but also cost effective. In this study we have analyzed the clinical profile of patients suffering from distal NLD blockage and outcomes of EnDCR without stenting in patients with chronic dacryocystitis. In this study we have analyzed the clinical profile of patients suffering from distal NLD blockage and outcomes of EnDCR without stenting in patients with chronic dacryocystitis.

METHODS

Present cross-sectional study was conducted at department of otorhinolaryngology at G. K. General Hospital, Gujarat Adani Institute of Medical Science, Bhuj, Gujarat during the period of October 2019 to September, 2021 after taking IEC consent. This study consisted of 50 patients who were referred from department of ophthalmology, G. K. General Hospital, Bhuj to our department for the management of chronic epiphora with distal nasolacrimal duct obstruction. All patients were clinically evaluated at department of ophthalmology with pressure over the lacrimal sac for Regurgitation of any fluid from punctum (ROPLAS), probing and syringing. Patients were selected as random sampling method.

Inclusion criteria

All patients with NLD block were included in this study.

Exclusion criteria

The exclusion criteria's were (a) patients with lacrimal sac tumors; (b) patients with uncontrolled hypertension or diabetes mellitus; and (c) unwillingness for endoscopic surgery.

All patients were examined at outpatient department of otorhinolaryngology at G. K. General Hospital, Gujarat Adani Institute of Medical Science, Bhuj. Detailed history and clinical examination, including anterior and posterior rhinoscopy and diagnostic nasal endoscopy to rule out any nasal pathology producing nasolacrimal duct obstruction, like deviation of septum, sinusitis, nasal polyps or tumors was done. Patients were explained about disease pathology and surgical treatment with endonasal dacryocystorhinostomy. The routine blood investigations (CBC, RFT, LFT, S. electrolytes, HIV, HBsAg, PT with INR), X-ray chest PA view and electrocardiogram of each patient were done. Systemic evaluation and fitness for surgery were obtained. Pre-operative consent was taken after explaining benefits, risks and complications of procedure.

Endonasal dacryocystorhinostomy was done without stenting in all patients. Generally, patients were taken up for surgery under local anesthesia. General anesthesia was offered to uncooperative patients. Nasal packing (Merocel) was removed on 3rd day of operation in outpatient department along with nasal cleaning. All patients were asked for follow up on 7th day, 14th day, one month and three months. On follow up, nasal endoscopy and sac syringing were done.

A total of 50 patients were included in our study during the study period. The youngest patient in our study was 10 years old and the eldest patient was of 86 years. The mean age of patients was 49±16.5 years. Out of 50 patients studied, there were 33 females (67%) and 17 males (33%) with female to male ratio of 2:1. So, in our study chronic dacryocystitis was more common in females (Table 1). In our study, 27 out of 50 patients belonged to lower socio-economic class, 17 belonged to upper lower socio-economic class and rest 6 belonged to lower middle class (Table 2).

In our study, watery discharge from eye was the most common chief complaint (76%) during presentation followed by watery discharge and swelling over medial end of eye (20%) and only swelling over medial end of eye (4%) (Table 3). Most common side of presentation was left (48%) followed by right (42%) and bilateral (10%). Most common duration of chief complaint was between 3 to 12 months (Table 4). In our study, out of 50 patients, 5 patients suffered from diabetes, 7 were suffering from long term hypertension, other diseases like CKD, past TB and IHD were also seen in patients suffering with distal NLD blockage (Table 5). In 23 patients (out of 50), lacrimal sac fluid was sent for microbiological examination. Out of 23 reports, 10 samples were positive. Common bacterial species isolated from culture were Staphylococcus aureus (50%), Klebsiella pneumoniae (20%), Pseudomonas aeruginosa (20%) and one report showed gram negative bacilli (10%) (Table 6). Out of 50 operated cases, only 3 patients had stenosis of ostium at 3-month follow-up. Overall success rate of endoscopic endonasal DCR without stenting was 94% in our study (Table 7).

Table 1: Distribution of cases according to age and gender.

Age group (years)	Male	Female	Total no. of patients
0-15	1	0	1
16-30	1	6	7
31-45	3	12	15
46-60	2	9	11
61-75	8	5	13
>75	2	1	3
Total	17	33	50

Table 2: Distribution of cases according to socio-economic class (modified Kuppuswamy classification).

Socio-economic class (according to modified Kuppuswamy classification)	No. of patients
Upper	0
Upper middle	0
Lower middle	6
Upper lower	17
Lower	27
Total	50

Table 3: Distribution of cases according to chief complaint.

Chief complaints	No. of patients
Watery discharge from eyes	38
Discharge+swelling over medial end of eye	10
Only swelling over medial end of eye	2

Table 4: Distribution of cases according to side of involvement.

Side of complaints	No. of patients
Right	21
Left	24
Bilateral	5
Total	50

Table 5: Distribution of cases according to co-existing systemic disease history.

Systematic diseases	No. of patients
Diabetes	05
Hypertension	07
Chronic kidney disease (CKD)	01
Past history of pulmonary tuberculosis	01
Ischemic heart disease (IHD)	01

Table 6: Distribution of cases according to organism in culture and sensitivity report.

Organism in culture and sensitivity report	No. of patients
Staphylococcus aureus	5
Klebsiella pneumoniae	2
Pseudomonas aeruginosa	2
Gram negative bacilli	1
Total	10

Table 7: Distribution of cases according to success rate in timely follow-up.

Follow up time period	No. of patients with patent ostium	No. of patients with closed ostium	Success rate (%)
One week follow up	50	0	100
Two weeks follow up	50	0	100
1-month follow up	47	3	94
3-months follow up	47	3	94

DISCUSSION

In this study 50 patients were evaluated and found to have nasolacrimal duct obstruction. All of them underwent Endonasal Endoscopic dacryocystorhinostomy without stenting. Out of 50 patients, 33 were females (67%) and 17 were males (33%). Nasolacrimal duct obstruction was more common in females than in males. Coumou et al and Trimarchi et al studies also reflect that it is common in females with former having 332 females and 100 males and latter having 291 females and 110 male patients.^{6,7} Majority of females patients in our study were in age group of 31 to 60 years with youngest one of 27 years and oldest patient was of 86 years old. Mean age of male patient was 49 years and mean age of female patients was 50 years. In our study 48 patients out of 50 had complaint of epiphora, rest of 2 patients only had complaint of swelling over medial end of eye. Most common chief complaint was watery discharge from eye (76%) followed by watery discharge and swelling over medial end of eye (20%). 24 (48%) patients had complaint in left eye, 21 (42%) patients in right eye and 5 (10%) patients had complaint in both eyes. Most common duration of complaint was 3 to 12 months. On an average, the patients suffered for 11.6±9.64 months (range 1-36 months) before seeking treatment. According to a study conducted in 2019 with 83 patients by Balaji et al, the patients suffered for 9.3±6.74 months (range 0.5-22 months) before seeking treatment and the average follow-up was 31.07±11.69 months (range 15-54 months).⁸

In our study, out of 50 patients, 5 patients suffered from diabetes, 7 were suffering from long term hypertension with one patient suffering from chronic kidney disease, one with ischemic heart disease and one with pulmonary tuberculosis. We found that diabetic patients had higher ratio of post-operative stenosis and episodes of reinfection (3 out of 5). In a study conducted by Keren et al in 2020 specifically aiming to find reasons of failure in EnDCR showed the overall success rate for the surgery in total of 165 patients was 94.7%. The parameters that correlated significantly with failure were coexisting diabetes mellitus (p=0.037), allergy to medications (p=0.034), and prior

ocular surgery ($p=0.043$).⁹ In the present study, out of 50 patients, 4 patients had history of nasal surgery in past. Out of 50 patients, 5 had cataract and 2 patients had glaucoma. They were sent to otorhinolaryngologist to address the chronic dacryocystitis before correcting cataract. 12 weeks after DCR, patients underwent cataract surgery. Dacryocystitis is a relative contraindication for any surgical procedure in anterior and posterior chambers of the eye and DCR was done to relieve the obstruction and symptoms.

14% patients had high septal deviation to the side of lesion obscuring the view of lacrimal sac area and the root of attachment of middle turbinate. All the 7 patients with septal deviation underwent septal correction and subsequently underwent dacryocystorhinostomy after 6 weeks. Septal deviation per se is not responsible for chronic dacryocystitis. Septal deviations which are anterior and obscuring the lacrimal sac are dealt surgically to improve space between the septum and lacrimal sac area which is helpful in elevating the flap, avoiding preoperative mucosal injury and adhesion, post-operative suction clearance and maintenance of patency of nasal cavity and neo-ostium.^{10,11}

All of patients had ROPLAS test positive and sac syringing had regurgitation from opposite punctum. 21 patients were operated on right side, 26 patients were operated on left side and 3 patients were operated on both sides. Out of 50 patients, 31 patients were operated under local anesthesia and 19 patients were operated under general anesthesia. In a systemic analysis done by Vinciguerra et al, they suggested that En-DCR performed with general anesthesia should be considered as the solution of choice; however, local anesthesia, eventually associated with a sedation, can be used as an alternative in selected cases.¹²

In only one patient of our study it was difficult breaking lacrimal bone due to thick frontal process of maxilla, for which powered drill was used to cut through bone for lacrimal sac approach. There was no significant benefit of using drill in each patient as use of Kerrison punch was adequate for creating neo-ostium. In a study over merits of Kerrison punch over powered drill in endonasal DCR, the authors concluded that no significant difference was found between the powered drill and non-powered groups in terms of success rate and complications. Non-powered Kerrison punch showed significant reduction in operating time compared to powered drill for endoscopic DCR. Total of 61 patients were included in the said study published in 2018 (35 Kerrison punch and 33 drill).¹³ In our study, out of 50 patients, 31 patients had post-operative nasal packing and rest 19 weren't packed post operatively. Outcomes of both groups were equal in terms of patency of neo-ostium. A comparative study done by Chin et al in 2020 over stenting and ostium packing in EnDCR suggested mechanical adjuvants were found useful only to improve anatomical but not functional success. Also, non-surgical factors including patient's age and ostium shape, the latter

reflects the underlying lacrimal sac and ostium healing process, were associated with functional outcome, which is a more important endpoint than anatomical patency.¹⁴

Out of 50 patients in our study, fluid from lacrimal sac of 23 patients was sent for culture and antibiotic sensitivity test. 10 samples were positive in culture. Bacterial species isolated from culture were *Staphylococcus aureus* (50%), *Klebsiella pneumoniae* (20%), *Pseudomonas aeruginosa* (20%) and gram negative bacilli (10%). In a different study over bacteriology of dacryocystitis done by Shah CP et al, from 100 samples, a total of 122 bacterial isolates were obtained. The most common organism associated with the infection was *S. aureus*. The antibacterial sensitivity showed more effectiveness towards gram positive isolates than Gram negative isolates.¹⁵ In our study, results of surgery were evaluated as relief of symptoms and patency of neo-ostium. Relief of symptoms is classified as complete relief, better than before and no improvement. Results were analyzed at 1-month and 3-months follow-ups. After 3 months in patients who underwent primary dacryocystorhinostomy 94% ($n=47$) had complete relief and 6% ($n=3$) had improvement in symptoms and no patient was without improvement in symptoms. Ostium was patent as evidenced by passive flow of dye into the nasal cavity in 93.6% ($n=47$) and blocked in 6.4% ($n=3$). In other studies of average success rate of EnDCR without stenting was around 90%. Few of the studies and their success rate are mentioned in Table 8.

Table 8: Comparison of success rate of EnDCR in previous studies.

Study	Publication year	No. of participants	Success rate in non-stenting EnDCR (%)
Cavaliere et al ¹⁶	2021	60	90
García et al ¹⁷	2021	156	87
Longari et al ¹⁸	2016	84	88.60
Mohamad et al ¹⁹	2013	89	89

Limitation

Sample size of the present study was small, we cannot generalize the findings of the present study to the whole population.

CONCLUSION

Chronic dacryocystitis is common in middle age (30-40 years age group). Females are affected more than males (2:1). Commonest presenting symptom is epiphora. Commonest sign of disease is regurgitation of purulent

material on compression of sac. Treating the concurrent nasal disease appropriately prior to the lacrimal surgery improve the outcome. Common difficulties encountered during surgery are narrow nasal cavity, thick frontal process of maxilla and bleeding during elevation of flap. Common postoperative problems are formation of granulations and synechiae at the neo-ostium. With good patient selection, good exposure of lacrimal sac, good surgical technique and good postoperative care we could achieve success rate (94%) comparable to that of external DCR or EnDCR with stenting.

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