Original Article

Is dacryocystectomy effective in reducing epiphora?

Md Shahid Alam, Debi Kundu

Purpose: To study the efficacy of dacryocystectomy (DCT) in reducing epiphora in cases of primary acquired nasolacrimal duct obstruction. **Methods:** This was a prospective, nonrandomized, interventional study conducted over a period of 12 months. All cases who either opted or satisfied our criteria for DCT in primary acquired nasolacrimal duct obstruction (age above 70 years) were included in the study. Patients with secondary nasolacrimal duct obstruction and those undergoing revision surgeries were excluded. Patients were asked to report the percentage improvement in postoperative watering subjectively. Munk score and fluorescein dye disappearance test (FDDT) were recorded pre- and postoperatively. Wilcoxon signed ranked test was used for analysis. **Results:** Eighty-two eyes of 65 patients were included. Most of the patients (46, 70.8%) were females. The mean age was 68.46 ± 5.7 years (range: 60–85 years). The mean subjective improvement in watering was 86.8%. The *P* value for preoperative and postoperative difference in Munk score and FDDT score was highly significant (*P* = 0.00001). **Conclusion:** Apart from providing relief from ocular discharge, DCT also provides significant improvement in watering. Patients can be preoperatively counseled regarding chances of reduction in epiphora following surgery.

Key words: Dacryocystectomy, epiphora, FDDT, Munk, reflex tear secretion

Access this article online

Website: www.ijo.in

DOI: 10.4103/ijo.IJO_972_22

Quick Response Code:

Epiphora is the most common sign and the most troublesome symptom of obstruction of lacrimal drainage pathway. In 1986, Linberg and McCormick coined the term primary acquired nasolacrimal duct obstruction (PANDO) to describe a nasolacrimal duct (NLD) obstruction caused by inflammation of unknown cause that eventually leads to occlusive fibrosis of the NLD.[1] Epiphora is an annoying symptom of PANDO and can have a great impact on the quality of life.[2] Thomas Woolhouse, in 1724, first described dacryocystectomy (DCT) for treatment of acquired NLD obstruction.[3] DCT procedure consists of complete surgical extirpation of the lacrimal sac. Though the procedure does not create a bypass for tear drainage, removal of the lacrimal sac does not allow tear and lacrimal sac mucosal secretions to get accumulated, which can act as a conduit for infection. This not only relieves the patient from recurrent episodes of acute dacryocystitis, but also provides great relief in ocular discharge. Previous studies have shown that DCT can be indicated for PANDO, where the main concern is discharge and not epiphora.[4-9] However, there is no study till date on the effect of DCT on postoperative epiphora. The aim of the present study was to evaluate the efficacy of DCT in reducing epiphora in patients with PANDO.

Methods

The study included 82 eyes of 65 patients with PANDO who underwent DCT between April 2018 and March 2019. Institutional review board approval and ethical clearance were obtained, and the study adhered to the tenets of Declaration of Helsinki. All cases who opted for or satisfied our criteria for DCT in primary acquired nasolacrimal duct obstruction (age above 70 years) were included in the study. Patients with secondary NLD obstruction, previously failed cases, patients with lacrimal sac tumors, and patients with lower lid laxity and ocular surface disorders were excluded. Patients were provided with an information sheet translated into their language, and written informed consent was taken from all participants. Preoperatively, all patients were clearly informed about the possibility of epiphora after surgery. All patients underwent preoperative nasal endoscopy to rule out any intranasal mass lesion or nasal pathologies. Munk score and fluorescein dye disappearance test (FDDT) were used to analyze the results. Munk score and FDDT of all patients were assessed preoperatively and 2 and 6 weeks after surgery. Munk score was graded as follows:[10]

Grade 0: No epiphora.
Grade 1: Occasional epiphora requiring wiping less than twice daily.
Grade 2: Epiphora requiring two to four wiping per day.
Grade 3: Epiphora requiring 5–10 wiping per day.
Grade 4: Epiphora requiring >10 wiping or continuous tearing.

FDDT was performed without topical anesthesia by staining the tear using a fluorescein strip. The amount of remaining stained tear meniscus was assessed and recorded using cobalt light of an indirect ophthalmoscope after 5 minutes.[11]

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Received: 15-Apr-2022 Revision: 26-Jul-2022
Accepted: 09-Aug-2022 Published: 30-Nov-2022

Cite this article as: Alam MS, Kundu D. Is dacryocystectomy effective in reducing epiphora? Indian J Ophthalmol 2022;70:4416-8.

Table 1: Demographic details of the study population

Parameters	Number and percentage	
Sample size	65	
Age (years)	68.4±5.7 (range: 60-85)	
Sex		
Male	19 (29.2)	
Female	46; (70.2%)	
Laterality		
Right	29 (44.6%)	
Left	19 (29.2%)	
Bilateral	17 (26.1%)	
Subjective improvement in watering	86.8% (range: 20%-100%)	
Munk score		
Mean preoperative score	3.18	*P*=0.00001
Mean postoperative score	0.67	
Fluorescein dye disappearance test		
Mean preoperative score	2.62	*P*=0.00001
Mean postoperative score	0.7	

Grading of FDDT was done based on MacEwen and Young's modification of FDDT grading defined by Zappia and Milder as grade 0 (no fluorescence in the conjunctival sac), grade 1 (thin fluorescein marginal tear strips only), grade 2 (between grades 1and 3), and grade 3 (wide and bright fluorescein strip).[12]

Patients were also asked to report percentage improvement in postoperative epiphora subjectively. Wilcoxon signed ranked test was used for analysis.

Results

Eighty-two eyes of 65 patients were included in the study, of which 46 were females (70.8%) and 19 were males (29.2%) with a mean age of 68.46 years (range: 60–85 years, standard deviation [SD] 5.775) [Table 1]. Surgery was performed on the right side in 29 patients (44.6%) and on the left side in 19 patients (29.2%). Seventeen patients (26.2%) underwent bilateral surgery on the same day. After 6 weeks of surgery, none of them complained of postoperative discharge. Mean subjective improvement in watering was 86.83% (20%–100%). Mean preoperative Munk score was 3.18 (range: 0–4) and mean postoperative Munk score after 6 weeks of DCT was 0.67 (range: 0–3). Mean preoperative FDDT was 2.62 (range: 0–3) and mean postoperative FDDT after 6 weeks of surgery was 0.7 (range: 0–3). The *P* value for difference in Munk score and FDDT score before and after surgery was highly significant ($P = 0.00001$).

Discussion

DCT, which was described as a treatment option for NLD obstruction in 1724 by Woolhouse, remained the main treatment option for this condition until Toti popularized dacryocystorhinostomy (DCR) in 1904.[3] After the advent of DCR, less and less surgeons resorted to DCT and as the time progressed, its indications were defined and limited.

Currently, the only absolute indication for DCT is the presence of lacrimal sac tumors; however, over the past few years, several other conditions have been described where DCT has been found to be advantageous. These conditions include elderly population, dry eyes, patient with systemic comorbidities like hypertension and cardiac ailments, ocular surface disorders like Steven Johnson syndrome and pemphigoid, systemic lupus erythematosus, and Wegener's granulomatosis.[4-9] In most of these conditions, the primary complaint of the patient is discharge rather than epiphora, and hence, DCT correctly serves the purpose.

In a cases series of 11 patients who underwent DCT, six patients had PANDO and all of these patients had no or minimal epiphora post-surgery.[5] In another series by Meireles *et al.*,[6] 76.5% of the patients had no complaints of epiphora after undergoing DCT and only four patients had persistent epiphora. Cook *et al.*[7] report a case of an elderly patient with multiple comorbidities and recurrent dacryocystitis. The patient underwent DCT in view of his old age and concurrent comorbidities. The patient had complete relief in his symptoms of discharge and epiphora. The primary aim of all these studies was to mention the relevance of DCT in an era where DCR has become the gold standard for management of NLD obstruction. Absence or relief in epiphora was just mentioned as a finding in these studies and was not analyzed scientifically.

In the present study, we observed that DCT can significantly reduce epiphora in elderly patients with primary NLD obstruction, with as many as 23% eyes having complete relief, while the overall mean percentage improvement in epiphora was 86.5%.

Matayoshi *et al.*[5] reported that eight out of their 11 patients had little or no increase of tearing noted despite the presence of NLD obstruction after DCT. Even after such an encouraging result, the authors go on to mention that patients should be informed regarding the persistence of postoperative epiphora. This article reflects the mindset of oculoplastic surgeons performing DCT, wherein there is a general belief that epiphora will persist after DCT since a bypass anastomosis has not been created. Our article clearly suggests that this mindset has to change and at least the elderly patients can be provided with a hope of some relief in epiphora even after a DCT.

We assume that the improvement in epiphora noted after DCT can be because of two reasons. Firstly, the elimination of ocular discharge significantly reduces reflex watering produced by the collection in conjunctival cul-de-sac and secondly, the presence of dry eyes in varying extents in the elderly population.[13,14] Studies showed that with increasing age, tear production is reduced, causing aqueous deficient and evaporative dry eye.[14,15] The effect is more marked in females because of the hormonal influences, and this too can explain improvement in postoperative epiphora since NLD obstruction is more common in females.

Conclusion

DCT can be offered as a treatment option for PANDO in elderly patients. Appreciable improvement in epiphora can be expected after surgery and the patients can be informed regarding this before the surgery.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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