



A COMPARATIVE STUDY: EXTERNAL VERSUS ENDOSCOPIC DACRYOCYSTORHINOSTOMY IN CENTRAL U.P.

Otolaryngology

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ABSTRACT

Background: In past years, external dacryocystorhinostomy has been considered the gold standard in terms of functional outcome for treatment for nasolacrimal duct obstruction. **Aims & Objectives:** In comparison, interest in the use of the recently developed endoscopic dacryocystorhinostomy procedure has been rekindled because of advances in instrumentation vs external DCR. **Material & Methods :** This clinical study was conducted at the Department of ophthalmology and Otorhinolaryngology, Hind Medical College Hospital, Mau, Ataria, Sitapur from 2017 to 2019. A total of 200 patients were included in the study which were respectively selected by the authors for the procedure. 100 patients (50%) underwent external dacryocystorhinostomy and the remaining 100 (50%) underwent endoscopic dacryocystorhinostomy. Results : And endoscopic DCR shows better results than external DCR. It can be concluded that endoscopic DCR is as good as external DCR for the treatment of primary nasolacrimal duct obstruction and chronic dacryocystitis. **Conclusion :** The surgical duration for endoscopic DCR is short as compared to that of the external approach and endoscopic DCR shows better results with highly significant value.

KEYWORDS

Dacryocystorhinostomy, Endoscopy, Epiphora, Nasolacrimal duct obstruction

INTRODUCTION

Epiphora due to nasolacrimal duct obstruction is a common clinical problem that can be caused by functional or anatomical abnormality. An anatomical obstruction could be at any point along the lacrimal excretory system and could be congenital or acquired. The primary acquired nasolacrimal duct obstruction is believed to occur due to chronic inflammatory process resulting in fibrosis, stenosis, and closure of the duct ostium^[1].

Nasolacrimal duct obstruction inhibits the flow of tears from the eye to the nose, leading to symptoms of epiphora. The clinical spectrum of epiphora ranges from the occasional trickle to chronically irritating overflow of tears. Epiphora results from a disruption in the balance between tear production and drainage^[2].

The lacrimal excretory pathway begins at a 0.3-mm opening on the medial portion of each eyelid termed the punctum. The punctal opening widens into the ampulla, which is 2 mm in height and directed perpendicular to the eyelid margin, before making a sharp turn into the canaliculi. In more than 90% of individuals, the superior and inferior canaliculi merge to form a common canaliculus before entry into the nasolacrimal sac[3-5]. The upper and lower canaliculi joined at the wall of the lacrimal sac without a common canaliculus in an additional 4%, with only 2% of systems having completely separate drainage of the upper and lower canaliculi into the lacrimal sac^[6].

Dacryocystorhinostomy (DCR) is the most accepted procedure for nasolacrimal duct obstruction. It can be done with external (Ex) or endonasal (En) access. The basic indication is same in all cases and either route can be used. The external approach is performed through a cutaneous incision to access the lacrimal sac. The procedure gained popularity due to its efficacy and relatively low complication rates. Endoscopic endonasal DCR has gathered momentum with direct visualization under endoscopic guidance. Caldwell first introduced the endonasal approach for lacrimal surgery in 1893. However endoscopic endonasal DCR has only become recently employed with new endoscopy instruments and technique[7]. This approach avoids an external scar and neurovascular disruption along the tract exposing the lacrimal sac.

This study compares the outcome of external dacryocystorhinostomy with that of endoscopic endonasal dacryocystorhinostomy.

MATERIALS AND METHODS

The Present Study: "External dacryocystorhinostomy versus endoscopic endonasal dacryocystorhinostomy: A Comparison", was conducted in the Department of ophthalmology and Otorhinolaryngology, Hind Medical College Hospital, Mau, Ataria,

Sitapur from 2017 to 2019 Source of data: The patients attending the ophthalmology and the ENT out patient departments of Hind Medical College Hospital, Mau, Ataria, Sitapur, who were diagnosed for primary acquired nasolacrimal duct obstruction or chronic dacryocystitis by an ophthalmologist.

Sample Size: 200 cases of primary acquired nasolacrimal duct obstruction or chronic dacryocystitis were included in this study. They were divided into two groups - One Group had 100 patients with external dacryocystorhinostomy and second group had 100 patients who underwent endoscopic endonasal dacryocystorhinostomy.

Inclusion Criteria:

1. Patients with epiphora and primary acquired nasolacrimal duct obstruction or chronic dacryocystitis
2. Patient willing for surgery.

Exclusion Criteria:

1. Patients having canalicular and punctal obstruction.
2. Patients having ectropion or entropion.
3. Patients with noticeable lower lid laxity.

METHOD OF COLLECTION OF DATA

After taking detailed history, thorough anterior rhinoscopy was done to check abnormalities like a deviated nasal septum, polyposis and hypertrophied turbinates. The ophthalmic examination was done by an ophthalmologist. The eyelids were examined for entropion, ectropion and lid laxity along with puncti for their normal location and size. Any medial canthal swelling was also examined. Nasolacrimal duct obstruction was diagnosed by the regurgitation of fluid into the conjunctival sac by applying pressure over the lacrimal sac area. Lacrimal sac syringing was done to confirm the diagnosis. Routine blood investigations were also done.

TREATMENT

DCR creates an alternative passage for the drainage of tears between the lacrimal sac and nasal cavity, bypassing the nasolacrimal duct. This can be achieved either by an external approach or through the nasal cavity using an endoscope (endonasal approach).

EXTERNAL DCR

All external dacryocystorhinostomy process were performed under local anaesthesia.

10% xylocaine sprayed in the nasal cavity was packed with a gauze soaked in 4% xylocaine with adrenaline 1:10,000. All patients were anaesthetized for the sac region, by using 2% xylocaine with

adrenaline 1:2,00,000. An incision of 1.5 to 2 cms in length and curvilinear shape, was made lateral to the angular vein, 3 mm from the medial canthus. The orbicularis muscle fibers were separated. The lacrimal fascia was incised 1mm lateral to the anterior lacrimal crest and the bony attachment of the medial canthal ligament was divided. The lacrimal sac was separated from the lacrimal fossa. The lamina papyracea, the papery thin bone of the posterior half of the lacrimal fossa was fractured and the nasal mucosa was stripped from the lacrimal bone to avoid damage to it. A bony osteotomy of 10mm in diameter, was created. Blood oozing was controlled by packing with gauze which was moistened with 2% xylocaine with adrenaline.

After anaesthetizing the eye with 4% xylocaine drops, the upper punctum was dilated and a Bowman's probe was passed through it to tent the medial sac wall. The lacrimal sac and then the nasal mucosa were opened in an "H" shaped to form larger anterior and smaller posterior flaps using Bard Parker blade number 15. The anterior flaps of the nasal mucosa and the lacrimal sac were sutured by using interrupted sutures with 6.0 vicryl. The incision was closed in layers. The duration of surgery was measured from the making of the incision on the skin to the end of the closure of the skin incision by suturing.

ENDOSCOPIC DCR

All procedures were done under local anaesthesia. The nasal cavity was sprayed with a 10% xylocaine spray and it was packed with a roller gauze which was soaked in 4% xylocaine with adrenaline

1:10,000. A 0-degree nasal endoscope is used to visualize the anatomy of the lacrimal area just anterior to the middle turbinate in the lateral wall of the nose.

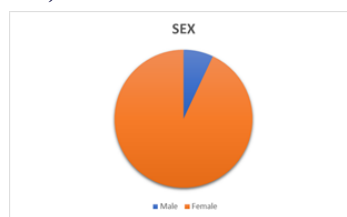
The mucosa of the lateral nasal wall was infiltrated with 2% xylocaine with 1:2,00,000 adrenaline, just anterior to the attachment of the middle turbinate. A 1x1cm piece of mucus membrane which was anterior to the uncinate process was incised and excised with a 15 No. Bard Parker blade. The lacrimal bone overlying the lacrimal sac area was removed by using punch forceps. The lacrimal sac was visualized after the removal of the lacrimal bone. More bone was removed to expose the medial wall of the sac. The lacrimal part of the fossa was removed up to the base of the uncinate process. Thus, about 1x1cm of bone was removed to expose the medial wall of the sac completely. The excessive bleeding was controlled by applying gauze strips which were dipped in a solution of 4% xylocaine with 1:10,000 adrenaline. The lacrimal sac was confirmed endoscopically by applying pressure on the outside over the medial canthus and the bulging of the sac was noticed intranasally. Externally, the eye was anaesthetized with 4% xylocaine drops, the lower punctum was dilated and a Bowman's probe was inserted in order to tent the medial wall of the sac intranasally. The tented mucosa of the sac was incised by a sickle knife and the medial wall of the sac was excised. Lacrimal sac syringing was done with normal saline and a free flow of the fluid was observed endoscopically. The nose was packed with Neosporin ointment smeared ribbon gauze on the operated side. All the patients were discharged on the day following surgery and were called for regular follow-up. The patency of the lacrimal passage was investigated by sac syringing.

RESULTS

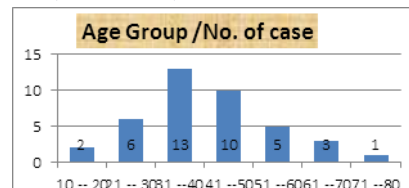
A total of 200 patients were included in the study which were respectively selected by the authors for the procedure. 100 patients (50%) underwent external dacryocystorhinostomy, and the remaining 100 patients (50%) underwent endonasal dacryocystorhinostomy (Table - I). The results were evaluated for 3 months depending on the symptoms. 186 patients were female (93%) and 14 were male (07%) (Figure - II), range from 15-72 years (Figure - I). All 200 patients were local residents without any significant racial difference. 173 cases were done in the right eye (86.5%) and 27 in the left eye (13.5%) (Table - II). All patients failed syringing and fluorescein testing.

After 3 months result comparison was done and 100 patients (50%) which were operated by endoscopic technique, out of them 98 patients were successful (98%) and remaining 100 patients which were operated by external approach shows results with 71 patients successful rate (71%), (Table - III) which shows that endoscopic DCR is highly significant with p-value < .00001

SEX (FIGURE - I)



AGE GROUP (FIGURE - II)



TYPE OF SURGERY (TABLE - I)

Type	
External DCR	100 (50%)
Endoscopic DCR	100 (50%)

EYE SIDE (TABLE - II)

Side	
Right Eye	173 (86.5%)
Left Eye	27 (13.5%)

RESULT COMPARISON OF EXTERNAL DCR & ENDOSCOPIC DCR (Table-III)

	Performed	Success after 3 months	Failure after 3 months	P- Value
Endoscopic DCR	100	98 (98%)	2(2%)	chi-square statistic Value = 27.8297 at p <.01. p-value < .00001. (Highly Significant)
External DCR	100	71(71%)	29(29%)	
Column Totals	200	169	31	

DISCUSSION

Dacryocystitis is a very common affection sparing no specific age group. Obstruction of nasolacrimal duct can be approached either externally by an ophthalmologist or endoscopically by the rhinologist. Chronic dacryocystitis were more common in the lower socio-economic groups. A maximum incidence was seen in the 3rd and 4th decades of life. In a study which was conducted by Coker et al (2000), the age of the patients ranged from 4 to 76 years[8]. HB Whittet et al (1993) observed that the age of their patients ranged from 14 to 80 years[9]. In the this study, the patients were aged between 15 to 72 years of age. 65% of the patients were females and 10% were males. In a study conducted by Sprekelsen et al (1996), 80% of the patients were females and only 20% were males[10]. Most studies have demonstrated that 70 to 80% cases of chronic dacryocystitis occurred in females. The striking predilection for females can be explained by the narrower lumen of the bony nasolacrimal canal. It is also possible that endocrine factors may be playing a role in the aetiology of chronic dacryocystitis.

Advantages of endoscopic DCR over the traditional external approach include avoidance of skin incision along with its possible complications; preservation of the pump mechanism of the orbicularis oculi muscle, less bleeding and the ability to address nasal or paranasal sinus abnormality at the same time. Limitation of injury to tissues at the osteotomy site, and faster rehabilitation are also noted. The endoscopic approach took less dissection time as compared to that in the external approach. Tarbet et al (1988) recorded an average of 100 minutes for external DCR[11]. Our study correlates well with Hartikainen et al's study, who noticed a surgical duration of 38 minutes for endoscopic dacryocystorhinostomy and 78 minutes for external dacryocystorhinostomy[12]. Both the procedures had minimal intra-operative and post-operative complications. Endoscopic DCR totally avoided an external scar, injury to the medial palpebral ligament and

injury to the angular vein. The greatest advantage of endoscopic DCR was that, after having made a wide excision of the lacrimal sac, the result could be checked on the operating table itself. The procedure was accomplished without interference from any of the external structures surrounding the eye-ball. A success rate of 90% was observed in both the approaches. The success of the procedure was defined as a patent lacrimal drainage system at the end of 3 months. The success rate of external DCR has been reported at 90% to 97%, depending on the surgeon's experience. (Olver JM, 2003)[13]. The success rate of endoscopic DCR has been reported between 82% to 86% (Rice DH et al, 1990; Shun Shin et al, 1998)[14,15]. In the present study, the immediate success rate was 71% in external DCR and was 98% in endoscopic DCR as demonstrated by post-operative patency demonstration by irrigation.

CONCLUSION

It can be concluded that endoscopic DCR is as good as external DCR for the treatment of primary nasolacrimal duct obstruction and chronic dacryocystitis. The surgical duration for endoscopic DCR is short as compared to that of the external approach. Endoscopic DCR avoids a scar on the face and injury to the neighboring structures like the medial palpebral ligament and the angular facial vessels. With the widespread use of nasal endoscopes, this surgery is gaining popularity over external dacryocystorhinostomy with better endoscopic results.

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