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Endoscopic Endonasal Dacryocystorhinostomy: A Clinical Study of Surgical Management for Dacryocystitis

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ABSTRACT

Endoscopic Endonasal DCR is a highly rewarding Endoscopic procedure for management of dacryocystitis when epiphora does not respond to medications or repeated syringing of nasolacrimal duct. It is a simple, less time consuming, safe but skillful, highly satisfying surgery both for the patients as well as the surgeons. There is very big advantage of Endoscopic Endonasal DCR, it is close 100% successful procedure, even if there is recurrence of epiphora it is again correctable fully with no residual effects. Endoscopic Endonasal DCR is far more superior to External DCR/Laser DCR and there are definite reasons for it. A total number of 78 cases have been operated from April-2025 to October -2025, only very few reoccurrences were there and they were corrected easily so much so that it can be said that it is a close 100% successful procedure and best surgical management of dacryocystitis up to date. The successful outcome was defined as symptomatic relief from epiphora and dacryocystitis and a patent nasolacrimal duct upon syringing at the end of procedure and on follow up of patient.

Keywords*: Endonasal endoscopic dacryocystorhinostomy (EEDCR), Dacryocystorhinostomy (DCR), Nasolacrimal duct (NLD), Lacrimal fluid (LF), Dacryocystectomy (DCT), Functional endoscopic sinus surgery (FESS).*

INTRODUCTION

Lacrimal system starts with lacrimal gland situated in a pad of fat in the dorsolateral part of orbital cavity and drains into conjuctival sac via many excretory ducts [1]. The tear film serves as a blanket of moisture over corneal surface preventing dryness of eye. Tears are spread all over conjuctival lining by the blinking action of upper and lower eyelids. Tears collect in the medial canthal segment of eye where lacrimal lake is situated. Orbicularis oculi acting on the medial canthal ligament including the lacrimal muscle, pump the lacrimal fluid into upper puncta (30%) and lower puncta (70%) during contraction stage of muscle [2]. Relaxation of Orbicularis oculi and lacrimal muscle directs fluid from puncta and canaliculus to the lacrimal sac as a negative pressure is created in the sac lumen [3]. Again contraction of OO and LM and also minimum contribution of gravity [2] compresses the fluid collected in the sac to the nasolacrimal duct situated in anterolateral wall of nose, passing anterior to middle turbinate mostly (not always) and opening in the anterior portion of inferior meatus of nose. Tarsal plates and tarsal fibres keep the puncta opening directed towards conjunctival lining in the lacrimal lake area [3]. So epiphora can also result whenever eyelid is in abnormal positions. Blockage of NLD whether intra luminal, extra luminal causes decreased outflow of LF and resultant stasis of secretions causes inflammation of NLD as well as lower sac area. Recurrent blockage of NLD ultimately leads to complete adhesions and permanent blockage, resulting in Dacryocystitis

MATERIALS AND METHODS

All the 78 patients attending OPD in Department of ENT and patient referred from Department of ophthalmology, Gulbarga Institute of Medical Sciences, Kalaburagi during period of April-2025 to October -2025 were included in the study. All the patients were operated under General Anaesthesia with Endotracheal intubation.

All the EEDCR were done using 0-degree endoscope. Instruments were routine FESS with kerrison punch and lacrimal probe cannula set.

Fitness Criterias for DCR Surgery

(1) Endonasal DCR should not be done when malignant tumour is in proximity of NLD—it is may be cause of obstruction. Benign growths, sinonasal polyposis, septal deviations, allergic rhinitis, atrophic rhinitis, are all patients fit to be taken up for surgery, but since the pathology could be causative factor should be eliminated before/simultaneously or after the endonasalDCR procedure explaining clearly the patient reasons for it.

(2) Acute Dacryocystitis are operable in acute stage also, but it is advisable to settle the acute stage first by giving appropriate course of antibiotics. After resolution of acute stage dacryocystitis becomes easily operable. Bleeding sometimes becomes difficult to manage since the field is restricted reason is obvious.

(3) Failed previous DCR (external/laser) are fit candidates for EEDCR provided lacrimal sac has not been excised in total during previous surgery. Lacrimal sac is very often removed during external DCT so as to prevent any nidus of infection in the anterior segment of eye prior to cataract surgery, so it is very important to confirm details regarding previous surgery, since a major portion of sac should be there. And for the same reason laser DCR failures are all fit to be taken

(4) Patency of puncta/canaliculus/sac :More than 70% of lacrimal fluid is pumped in the lower punctum so less than 30% also drains through upper puncta [2]. Any one of the puncta and the corresponding canaliculi should be patent draining to sac sometimes directly (in 10% cases common canaliculus absent) [2] and via common pathway i.e. common canaliculus which is 1–5 mm in length [2]. Recurrent dacryocystitis may cause external sinus, fistula, and or fibrotic adhesions around or in the sac itself distorting much of the sac structure even these cases are fit for the EEDCR since upper half of sac is usually patent and lumen of sac is directly visible during surgery. Excision of medial wall of sac in cases of blocked lower canaliculus, puncta is done in the upper medial wall of sac, and have very good success rates. External sinus, fistula close spontaneously following EEDCR.

Surgical Procedure

Patient should be fit for surgery. Normotensive, afebrile, controlled blood sugar, Hb, BT, CT, within normal limits.

Preanaesthetic Medication

This medication starts with 5 mg tablet of alprazolam night before surgery. Alprazolam can be repeated prior tosurgery is the choice depending on the anxiety which varies from person to person.

Local infiltration was done using 2% lidocaine with 1:200000 adrenaline and nose packed with the same using cotton pledges. Both infiltration and topical anaesthesia is better than anyone alone. Surgery consisted of basic steps [5, 6]. Elevation and simultaneous complete excision of nasal mucoperichondrium flap anteroinferior to MT around 5–10 mm as the first step. Exposure of ascending process of maxilla and adjacent lacrimal bone. Removal of bony processes overlying sac and NLD which are usually ascending process of maxilla, lacrimal bone, agger nasi and sometimes also anterosuperior using kerrison 2–3 mm punches up cutting and down cutting. Adequate hemostasis is a must during procedure , orbital fat can create trouble which lies in close proximity. Removal of bone was accomplished using kerrison punches. All the patients were taught how to do alkaline douching of nose post operatively and nasal douching was started from day one of procedure to at least for 10 days after surgery despite no epiphora. Also regular massaging over sac area was advised post operatively for at least 10 days. Post op. 7 day course of antibiotics, eye drops, nasal drops was given.

OBSERVATION AND RESULTS

Out of 78 patients, 20 were male and 58 were female. Female to male ratio been 3:1.

100% after primary surgery in first follow up after 7 days, 4–5% failures were there in follow up as they came whenever there was epiphora. These cases were again corrected easily under direct vision of endoscope by removing crust, granulation tissue, suction clearance over the endonasal ostia of sac under no sedation as an OPD procedure. Syringing was done simultaneously and patent NLD confirmed. So there are no complaints of epiphora in all patients up to date. In patients who had recurrent epiphora were 11 were easily corrected fully and are in follow up with no complaints for the last 6 months. Main reason of failure in these cases was due to, not cleaning the nose properly following initial 10 days of surgery. There was no serious complication during surgery in any case except for some minor bleeding as no endonasal cautery was used in any case.

DISCUSSION

Endonasal DCR is far superior than external DCR reason is simple and obvious [7]. Most of patients are females so if in any way a scar can be prevented over face will be a better option [4]. Females have significantly smaller dimensions in the lower nasolacrimal fossa and middle nasolacrimal duct. Hormonal changes that bring about a generalized de-epithelization in the body may cause the same within the lacrimal sac and duct. An already narrow lacrimal fossa in women predispose them to obstruction by the sloughed off debris [8]. Moreover an injudicious use of kaajal and adulterated cosmetics applied on the wrong side of eyelashes can also play important role in obstruction of nasolacrimal system. Female to male ratio advocated in one study recently was 10:1 in a study of 800 DCR cases[4]. Secondly, in external DCR medial canthal ligament has to be incised and then the sac is approached, the pumping system is interfered [9]. The circumferential OO muscle and the lacrimal muscle acting on the medial canthal ligament do suffer in external approach. Thirdly nasal anatomy is variable, in external approach nasal side is not taken care of. In Laser DCR again nasal endoscope is required to visualize the middle meatus due to anatomical variation of sac so difference is of knife and incision. In Laser DCR new sac opening and bone opening made is same size and usually narrow. Advantage of Endonasal DCR over LASER DCR is in follow up cases, less failures following Endonasal DCR since puncta canaliculus are not heated or injured [10, 11]. Deviated septum, sinusitis, cause closure of endonasal sac opening due to retention of secretions and correction again require endonasal endoscopic approach to sac. So in Laser DCR endoscopic guidance is must, difference is of knife. Anatomical variation of sac is dependent on anatomy of lateral wall of nose which is the sole reason of direct visualization under endoscopic guidance helps in achieving 100% success. Adequate removal of bone during procedure is the only root for success for surgery. In follow up patient should be strictly instructed to clear nose proper by using buffered saline solution to clear crusts/clots overlying endonasal sac ostia.

CONCLUSION

Endonasal endoscopic DCR is the best at present treatment of DCR. Under endoscopic guidance nasal anatomy is understood directly, managed accordingly, sac is approached directly under vision and so at the time of surgery result is known under endoscopic vision and so result is good in these cases.

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