

Research Article

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Endoscopic Dacryocystorhinostomy with Transcanalicular Illumination: How We Do It

Alshehri Abdulaziz^{1*}, Salamah Moustafa² and Eesa Mohamed³

¹Department of Otolaryngology, Head and Neck Surgery, King Fahad General Hospital, Jeddah, Saudi Arabia

²Department of Ophthalmology, Zagazig University, Zagazig, Egypt

³Department of Otolaryngology, Head and Neck Surgery, Zagazig University, Zagazig, Egypt

ABSTRACT

Background: The endoscopic dacryocystorhinostomy (endo-DCR) is replacing the external approach in many centres and it is also preferred by patients to avoid external scar. Proper detection of the lacrimal sac is one of the most important keys to obtain successful results. Transcanalicular illumination is a new technique which facilitates the endoscopic detection of the lacrimal sac precisely and shorting the time of surgery.

Objectives: This article outlines the standard technique used at our facility for performing endoscopic dacryocystorhinostomy (DCR) with a transcanalicular illumination. We describe the intraoperative techniques and postoperative follow up to present what we consider the standard procedure in our hospital.

Methods: Twenty tow case of Primary Nasolacrimal Duct obstruction has been operated with Endoscopic DCR with a transcanalicular illumination assistant.

Results and Conclusions: Transcanalicular Illumination DCR showed to have fewer intraoperative complication and short operative time with precisely lacrimal sac detection and high successful rate.

*Corresponding author

Alshehri Abdulaziz, Department of Otolaryngology, Head and Neck Surgery, King Fahad General Hospital, Jeddah, Saudi Arabia.

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Introduction

The endo-DCR is considered as the gold standard method for lacrimal surgery [1]. Experienced surgeon is mandatory for lower failure rates [2]. Several studies investigate the reasons of failure in either endoscopic or external DCR, some of these reasons are due to presence of underlying intranasal pathologies; such as deviated nasal septum, chronic sinusitis, inappropriate site of the rhinostoma, incomplete removal of uncinate process, unopened agger nasi, incomplete removal of the lacrimal bone and inappropriate bone window over the lacrimal sac [3-12]. Different landmarks were prescribed to detect the lacrimal sac probably, the enhanced visualization provided by endlight guidance facilitates accurate exposure of lacrimal sac.

Method and Technique

This retrospective single center study was conducted at Saudi German Hospital in Jeddah, Saudi Arabia from February 2017 to February 2025. Twenty tow patients were included 13 males and 9 females. All cases diagnosed as primary nasolacrimal duct obstruction. All cases managed with endoscopic-DCR with

transcanalicular illumination. All procedures were performed by a single rhinology surgeon and single ophthalmologist surgeon using a standardized operative protocol.

Eligible patients were all cases diagnosed with primary nasolacrimal duct obstruction who did not has surgery done before. patients with revision surgery, significant medical contraindications, or inability to complete scheduled follow-up were excluded from the study. Ethical approval was obtained from the Institutional Review Board of Saudi German Hospital. All patients provided written informed consent for surgery and anonymized clinical data.

All cases of endoscopic-DCRs were performed under general anaesthesia. Topical decongestion was done by intranasal pledgets soaked in 1:1000 parts of adrenaline leaving it for at least 10 min.

By endoscopic identification of important landmarks was done; the maxillary line, the uncinate process, and the superior attachment of the middle turbinate.

Probing of the upper canaliculus was done by ophthalmogst, then probing by the illuminator probe was done figure (1).



Figure 1

According to light in the nasal cavity, the mucosal flap was designed in a U-shape pattern using 15 blade scalpel the two horizontal lines was taken, the first one was 5mm above the insertion of the middle turbinate and extend anteriorly for about 5mm, the second line was taken midway between insertion of middle turbinate and inferior turbinate. By keratome the vertical line which connect the previous two lines was taken. The mucosal flap is elevated by suction elevator through the subperiosteal plane till the uncinate process, then holding it in the middle meatus. Illumination through the upper canaliculus again helps in bone removal, which was done by 2mm-45-degree kerson figure (2).

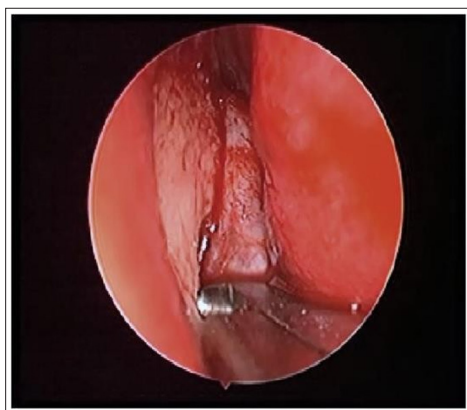


Figure 2

Complete exposure of the lacrimal sac and part of the nasolacrimal duct was confirmed by illumination figure (3). Marsupialization of the sac and duct was done by the keratome. Passing the 23-gauge vitreoretinal light probe.

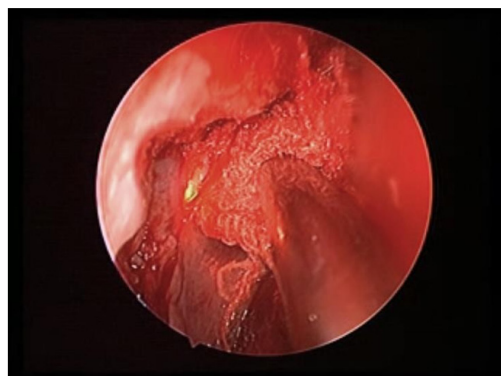


Figure 3

This nasal packing was removed next morning. Patients were prescribed Tab Amoxycillin-Clavulanic acid, one gram 12 hourly and Tab Paracetamol 500 mg 12 hourly for seven days. Tobramycin plus dexamethasone eye drops were prescribed four times daily for one month. Oxymetazoline nasal spray was prescribed to use, eight hourly, daily for two weeks.

Silicone tubes were removed three months after surgery and syringing of lacrimal system done to confirm patency of lacrimal passages. Success of the procedure was documented as absence of epiphora and patent nasolacrimal duct on syringing. Follow up examination was done after one day, one week and three months.

Results

Endoscopic Dacryocystorhinostomy (DCR) with transcanalicular illumination was performed in all patients. The age of the patients ranged from 25 to 73 years, with a mean ($\pm$ SD) age of 56.61 ± 8.21 years. Nasolacrimal Duct Obstruction (NLDO) was right-sided in 15 patients (68.2%) and left-sided in 7 patients (31.8%). Postoperatively, complete resolution of epiphora was achieved in 21 patients (95.4%). One patient (4.5%) reported persistent watery discharge at three months of follow-up due to lower canalicular obstruction. This patient underwent revision surgery using the same technique after three months, resulting in successful resolution. Consequently, the overall success rate approached 100% following revision. Endoscopic DCR with transcanalicular illumination was associated with precise localization of the lacrimal sac, shorter operative time, and fewer intraoperative complications. No intraoperative or postoperative complications were observed during the follow-up period.

Discussion

Dacryocystorhinostomy (DCR) remains the cornerstone surgical procedure for managing epiphora secondary to nasolacrimal duct obstruction. The fundamental objective of this operation is restoring the physiological lacrimal outflow by creating a bypass into the nasal cavity [13].

Over the past several decades, significant technological advances have refined this technique, introducing less invasive and more cosmetically favorable options. Among these, endoscopic has emerged as the gold standard, offering excellent visualization of the intranasal anatomy and avoiding cutaneous scarring associated with the external approach [1]. These techniques includes external DCR (Ex DCR), endo mechanical laser DCR, endonasal laser DCR. More recently, the minimal invasive techniques like transcanalicular laser-assisted endoscopic DCR have gained popularity and can be used for revision of failed external DCR (Ex DCR) [13].

Transcanalicular laser-assisted DCR allows the procedure to be performed under local anaesthesia, involves precise cutting and removal of tissue by ablation with minimal bleeding and reduced operative time, leaves no external scars, can be repeated, preserves ligaments and muscles of the internal canthus, and preserves lacrimal pump function [14-17].

Despite those advantages, the success rate of transcanalicular laser assisted DCR remains lower than that of traditional external DCR (Ex DCR). A prospective interventional case series conducted in 2007 revealed that Transcanalicular laser-assisted DCR was able to reestablish patency of the lacrimal system in 88% of the cases after 36 months of surgery with long-term success rate ranging from 59% to 92 % [18]. However external DCR (Ex DCR) remains

a gold standard in many centers as it continues to demonstrate higher long term patency rates and durability of results [19].

In comparison with Transcanalicular laser-assisted DCR and external DCR (Ex DCR) we found Transcanalicular illumination DCR has the advantage of minimal bleeding as the visualization through transcanalicular light helps the surgeon remain within correct anatomical planes and avoid unnecessary mucosa trauma also it requires less complex endoscopic surgical skills, improves intraoperative confidence and reduce surgical errors.

The technique evaluated in this study combines these principles by using endoscopic DCR with assist of transcanalicular light illumination. probing upper canaliculus by the illuminator probe facilitate the creating the mucosal flap and helps in bone removal enhancing detection of the lacrimal sac precisely and shorting the time of surgery.

The enhanced visualization provided by endolight guidance facilitates accurate osteotomy creation and more complete exposure of lacrimal sac. proper identification of the sac has long been recognized as a critical determinant of DCR success, and failure to correctly locate or fully open the sac is a cause of postoperative obstruction.

Overall, our finding support that endoscopic DCR with transcanalicular illumination is safe, minimally invasive, and highly effective technique for managing nasolacrimal duct obstruction (NLDO). By combining the advantages of endoscopic surgery with superior anatomical localization provided by transcanalicular illumination, this approach represents a valuable addition to contemporary lacrimal surgery. Further studies with larger sample sizes and longer follow-up periods are warranted to validate these results and to directly compare long-term outcomes with established DCR techniques [20].

Conclusion

Transcanalicular illumination DCR is reliable and provides good results also a viable option before proceeding to invasive procedure. Transcanalicular illumination DCR is minimal invasive technique offers reducing operative time, minimal bleeding, easily lacrimal sac detection and avoid external scarring. However, despite these benefits, its long-term success rate remains lower than that of conventional Ex DCR.

Statement of Ethics

The Institutional Review Board of the Saudi German Hospital (Jeddah, Saudi Arabia) approved the study. All the patients who participated in this study provided written informed consent. All the patient data remained confidential and were used for research purposes only.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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