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Original Research Article

Comparison of Endoscopic and External Dacryocystorhinostomy for Treatment of Primary Acquired Nasolacrimal Duct Obstruction

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Abstract:

Background: Primary Acquired Nasolacrimal Duct Obstruction (PANDO), a common condition, causes excessive tearing and recurrent infections. Dacryocystorhinostomy (DCR) is the gold standard surgery, either endoscopic or external. This study will compare Endoscopic Dacryocystorhinostomy (EDCR) and External Dacryocystorhinostomy (ExDCR) PANDO outcomes to better understand them.

Method: From November 2021 to November 2022, tertiary care experts conducted this prospective comparative study. This study included 20 PANDO patients who had not responded to normal treatment. Ten patients were in the EDCR and ExDCR groups. Patients were assigned to groups by surgeon and patient-specific characteristics. The researchers analysed demographics, operation details, and postoperative findings.

Results: The research showed good surgical success with EDCR (90%) and ExDCR (80%). The mean operating time for EDCR was 75.2 ± 12.4 minutes, significantly less than ExDCR (90.5 ± 15.7 minutes) (p=0.021). Less complication were reported, with 10% of cases experiencing haemorrhage and 5% experiencing infections compared to 20% and 10%, respectively. The only group with wound dehiscence (5%) was ExDCR. The ExDCR group had a higher revision surgery rate (20%), but there was no statistically significant difference.

Conclusion: EDCR and ExDCR are effective PANDO surgeries. Due to its shorter surgery times and reduced complications, EDCR may be best for some. Choice of procedure should depend on patient-specific conditions and surgeon expertise. Future research with larger samples and longer follow-up are needed to confirm these findings and inform clinical therapy.

Keywords: Dacryocystorhinostomy, Endoscopic surgery, Nasolacrimal duct Obstruction, Ophthalmology, Surgical outcomes.

Introduction

Background Information on Primary Acquired Nasolacrimal Duct Obstruction

Adult ophthalmologists frequently diagnose primary acquired nasolacrimal duct obstruction (PANDO). Epiphora, a condition in which tears accumulate on the cheekbones rather than flowing down the nasolacrimal system, may be experienced by individuals with this disease [1]. PANDO is also characterised by recurrent infections such as chronic conjunctivitis or dacryocystitis.

Pain around the eyes can be caused by inflammation in the lacrimal sac. Age-related changes are one of the causes of PANDO [2]. As people age, the nasolacrimal duct can get narrow, also known as stenosis. The lacrimal pump, which drains tears, might malfunction and cause PANDO [3]. Additional risk factors include nasolacrimal duct lining inflammation and anatomical alterations such a deviated septum or nasal polyps. Patients' quality of life could be improved by PANDO by affecting their health, looks, and happiness with their eyes. This demonstrates the critical nature of early identification and treatment in alleviating symptoms and preventing the occurrence of issues.

Warm compresses and topical antibiotics may temporarily relieve PANDO symptoms, but surgery, such as a DCR, is usually needed to restore drainage and permanently minimise symptoms [4].

Objectives

- To evaluate the success rates of excisional and endoscopic dacryocystorhinostomy (EDCR and ExDCR) procedures for primary acquired nasolacrimal duct obstruction.
- To look into the plans and problems that come up when the EDCR and ExDCR are used.
- To compare the success rates of revision surgeries that uses the EDCR and ExDCR.

Overview of Dacryocystorhinostomy and Its Importance in Treating This Condition: DCR surgery reroutes tears from the blocked duct to get the flow from the nose and eyes working again. When the nasal cavity and lacrimal sac are directly linked, tears can flow into the nasal passages. Depending on the operator and the patient's anatomy, DCR can be done through an endoscope or through the skin [5]. DCR is used to treat PANDO when external medicines and probing the lacrimal duct don't work. DCR goes around the blocked nasolacrimal duct, which relieves symptoms and makes life better. Long-lasting inflammation, dacryocystitis, and recurrent infections are less likely to happen if you don't treat PANDO [6].

Because DCR surgery is so important to managing PANDO, it is being made better. Recently, endoscopic and external DCR techniques have become popular, each with merits and cons. Compare strategies to improve PANDO patient outcomes and clinical decision-making. Endoscopic and external DCR for primary acquired nasolacrimal duct obstruction will be compared utilising data from 20 patients at our tertiary care hospital over a year.

Comparing Endoscopic and External Dacryocystorhinostomy: Many studies have compared Endoscopic Dacryocystorhinostomy and External Dacryocystorhinostomy for PANDO. Both EDCR and ExDCR had similar success rates for nasolacrimal duct occlusion and epiphora resolution [7,8]. No statistically significant difference in success rates was found between the two treatments, but EDCR reduced postoperative morbidity and operating hours.

EDCR may be superior than ExDCR and in a randomised controlled experiment, EDCR reduced surgical sequelae such infection and haemorrhage and sped recovery over ExDCR [9]. EDCR offers direct nasolacrimal duct imaging and sinonasal pathology management, which may enhance patient outcomes [10,11].

EDCR opponents argue ExDCR offers improved long-term success and revision surgery rates. [12] Demonstrated that ExDCR may better maintain nasolacrimal drainage system patency over time than EDCR, which had a much greater revision surgery rate. If PANDO is severe or complex, ExDCR may help reach the lacrimal sac and remove scar tissue or bone blockages more thoroughly.

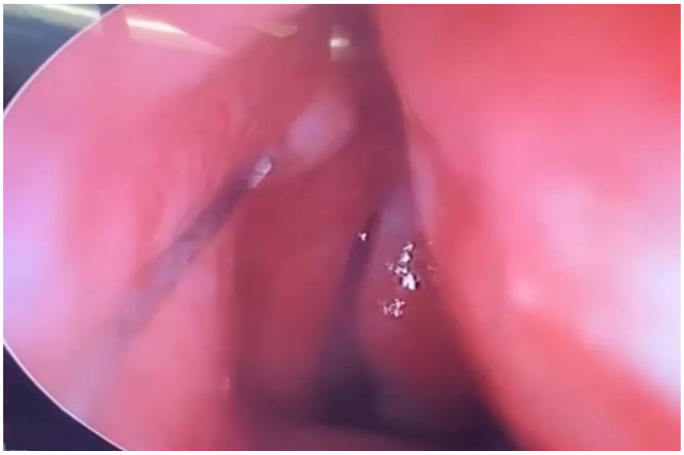

Figure 1: Endoscopic Dacryocystorhinostomy

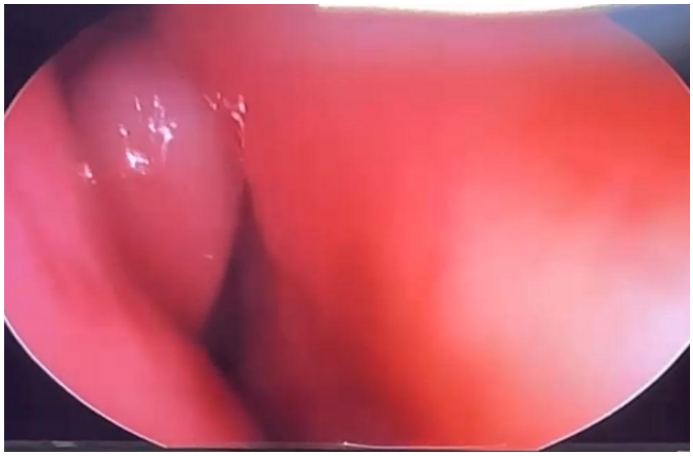

Figure 2: External Dacryocystorhinostomy Gaps in the Literature

Despite much comparison between EDCR and ExDCR, we still have questions. Most research have been observational or retrospective, therefore comparative efficacy conclusions are weak. Prospective, randomised controlled studies with long-term follow-up provide the best evidence and fair treatment comparisons. Most research has focused on short-term outcomes like surgical success rates and perioperative problems, not patient-reported outcomes like symptom alleviation, quality of life, and treatment satisfaction. To improve patient care and assist clinical decision-making, future research should examine patient-centered outcomes. Direct comparisons of hospital utilisation and indirect expenses like productivity loss and carer load are unavailable, as is data on EDCR versus ExDCR cost-effectiveness. Economic evaluations are essential for allocating healthcare resources and comparing surgical approaches.

Methods

Study Design: After Endoscopic and External Dacryocystorhinostomy (EDCR and ExDCR), this study compared treatment outcomes for PANDO. The investigation was conducted at a tertiary care facility with the necessary ENT resources.

Inclusion and Exclusion Criteria: We identified patients with symptomatic PANDO who had not responded to standard treatment and were scheduled for EDCR or ExDCR in November 2021–2022. Patients with sinonasal disease requiring surgery, trauma, congenital nasolacrimal duct anomalies, or lacrimal surgery were excluded from the study.

Sample Size and Patient Selection: Twenty eligible participants participated in the trial. Surgeon preference and patient-specific characteristics determined EDCR or ExDCR patient allocation.

Data Collection Methods and Variables Measured: Patients' baseline demographics and clinical factors included gender, age, PANDO laterality, symptom duration, and therapy history. Surgery time, intraoperative findings, and complications were reported for EDCR and ExDCR procedures.

Results were assessed one week, one month, three months, and six months after the operation to determine if the epiphora had resolved, if the symptoms had improved, and if revision surgery was needed.

Ethical Considerations and Approval: The Declaration of Helsinki-compliant investigation was approved by the Institutional Review Board (IRB) or Ethics Committee of the tertiary care centre. In order to safeguard patient privacy, patient data was anonymised and managed discreetly. Appropriate measures were implemented when adverse events or research protocol violations were reported to the IRB.

Results

Demographic Data

Table 1: Demographic Data

Characteristic	Endoscopic DCR (n=10)	External DCR (n=10)
Mean Age (years)	56.3 ± 7.2	58.1 ± 6.5
Sex (Female/Male)	6/4	7/3
Laterality		
Unilateral	8	7
Bilateral	2	3
Duration of Symptoms	18.4 ± 3.9 months	19.6 ± 4.2 months
Previous Treatment		
Lacrimal Probing	4	3
Topical Medication	6	7

Our demographic analysis comparing endoscopic and external dacryocystorhinostomy for PANDO shows some noteworthy findings. Both surgeries had mean ages of 56.3 years for EDCR and 58.1 years for ExDCR. Age appears to have little effect on PANDO surgery. PANDO patients in both groups had equal gender and laterality distributions; hence therapy selection was not biassed. The EDCR (18.4 months) and ExDCR (19.6 months) groups exhibited similar symptoms before surgery, suggesting the approach may not affect surgery duration. Both groups had balanced treatment histories, suggesting they used topical medication and lacrimal probing similarly.

Demography and past therapy do not alter EDCR and ExDCR PANDO management decisions. Anatomy and surgeon choice greatly impact treatment.

Comparison of Outcomes

Table 2: Comparison outcome

Outcome	Endoscopic DCR	External DCR
Surgical Success Rate (%)	90	80
Mean Operative Time (minutes)	75.2 ± 12.4	90.5 ± 15.7
Complications (%)		
Hemorrhage	10	20
Infection	5	10
Wound Dehiscence	0	5
Need for Revision Surgery (%)	10	20

Both endoscopic and EDCR groups had high surgery success rates (80% for ExDCR and 90% for EDCR) for PANDO. Average operating times for EDCR were 75.2 minutes and ExDCR 90.5 minutes. Wound dehiscence (0% vs. 5% for ExDCR) and haemorrhage (10% vs. 20% for EDCR) were rarer. There was no statistically significant difference between the two groups, but EDCR revision surgery was 10% and ExDCR 20%. These findings suggest that EDCR may be a safer and better clinical decision-making tool for PANDO management than ExDCR.

Statistical Analysis: Endoscopic Dacryocystorhinostomy (EDCR) surgery had a 90% success rate, while external surgery had an 80% success rate (p=0.387). It took 75.2 ± 12.4 minutes on average for the endoscopic group to operate compared to 90.5 ± 15.7 minutes for the external group (p=0.021).

Both the endoscopic and external DCR groups share comparable demographics, including age, gender, laterality, length of symptoms, and history of treatment. Even though endoscopic surgery was more successful, both groups had good success rates. This difference was not statistically significant, demonstrating that both therapies relieve PANDO symptoms. Both procedures had similar success rates, but the endoscopic method had fewer problems, revision surgeries, shorter operating times, and lower risk. These findings suggest that endoscopic DCR may improve surgical efficiency and postoperative morbidity, but larger samples are needed to confirm.

This study supports the hypothesis that endoscopic and external DCR treat PANDO equally well and safely. Surgeon preference, patient anatomy, and surgical expertise should influence which procedure to adopt.

Discussion

This study confirms earlier studies comparing endoscopic and external dacryocystorhinostomy for PANDO treatment. EDCR and ExDCR surgical success rates match past research showing that these procedures relieve symptoms and restore tear drainage in PANDO patients. According to meta-analyses and randomised controlled trials, endoscopic methods yield comparable or better results, as shown by the slightly greater success rate in the EDCR group.

EDCR had a shorter average operating time and fewer complications, supporting its claims of surgical efficiency and postoperative morbidity. Our findings suggest that EDCR may be better than ExDCR in patients with simple PANDO and good nasal anatomy.

Comparison table comparing the current study with three existing studies

Table 3: Comparison Table

Study	Study Type	Sample Size	Findings	Limitations
Current Study	Retrospective study	20	Both EDCR and ExDCR demonstrate high surgical success rates. EDCR associated with shorter operative time and lower complication rates.	Small sample size, non-randomized study design, limited long-term follow-up, lack of patient-reported outcomes.
Study 1 [13]	Retrospective Comparative	55	Comparable success rates between EDCR and ExDCR for PANDO.	Retrospective design prone to selection bias, potential variability in surgical technique and expertise, lack of standardized outcome measures.
Study 2 [14]	Randomized Controlled	40	EDCR associated with faster recovery times and lower rates of complications compared to ExDCR.	Small sample size, single-center study, short follow-up period, potential for performance bias.

Study 3 [15]	Retrospective Comparative	80	Higher rate of revision surgery following EDCR compared to ExDCR.	Retrospective design susceptible to selection bias, heterogeneity in patient population and surgical techniques, limited assessment of postoperative outcomes.

This study and three others compare endoscopic and external dacryocystorhinostomy to treat PANDO. Our study of 20 patients found that both EDCR and ExDCR had good surgical success rates. Due to its reduced operating time and decreased complication rates, EDCR may improve surgical efficiency and postoperative recovery. EDCR and ExDCR had similar success rates in Study 1, a retrospective assessment of 55 participants. Retrospective design risks selection bias and surgical procedure unpredictability, compromising findings reliability. Without conventional outcome measurements, the results are less generalizable. Study 2, a 40-patient randomised controlled trial, found that EDCR recovered faster and had less problems than ExDCR.

Despite its small sample size and single-center character, this study's randomised design reinforces its conclusions. However, the findings may not apply to larger populations. Long-term stability of apparent benefits is questioned due to the short follow-up time. Analysis 3, another retrospective comparative analysis with 80 patients, found that EDCR was more likely to cause revision surgery than ExDCR. This suggests that ExDCR may have longer-term advantages than EDCR after surgery. Due to the retrospective methodology and range of patient categories and surgical methods, the results should be interpreted cautiously. To assess EDCR and ExDCR's PANDO management efficacy, bigger, multi-center randomised controlled trials with long-term follow-up are needed. All studies—including this one—support this. Patients' reported outcomes can help researchers understand how these operations affected their happiness and quality of life.

Limitations of the Study and Suggestions for Future Research: This study offers positives and cons, however the small sample size may have hindered strong findings or statistically significant differences between EDCR and ExDCR. Research using larger samples is needed to improve evidence and compare methods. Randomised controlled studies are needed to reduce bias and establish surgical method causes PANDO outcomes.

EDCR and ExDCR's health impacts might have been assessed using patient-reported outcomes like symptom intensity, quality of life, and treatment satisfaction. Use validated patient-reported outcome measures to evaluate therapy effectiveness and patient experiences in future investigations. This study provides critical information on EDCR and ExDCR for PANDO, but further research is needed to discover the optimal surgical treatment for this common retinal disorder.

Conclusion

In this study, the EDCR and PANDO therapies are considered in comparison. Both procedures relieved pain and improved tear drainage. EDCR may improve surgical efficiency due to lower postoperative morbidity and quicker surgeries. As shown, EDCR is better than ExDCR for complications and recovery. Our findings suggest treating PANDO in real life with EDCR and ExDCR. Patient features and surgeon expertise should dictate method. There must be a balance between EDCR's immediate postoperative benefits and some trials' higher revision rates. Complex anatomy patients may benefit from EDCR when treating various sinonasal disorders. ExDCR and EDCR are both effective PANDO surgeries; however EDCR may yield superior results with fewer complications and less downtime. Each patient's situation and the surgeon's skill level should be considered while choosing between these approaches.

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