



Influence of weekly endoscopic debridement on success rate of endoscopic transcanalicular diode laser dacryocystorhinostomy

Haftalık endoskopik debridmanın endoskopik transkanaliküler diod lazer dakriyosistorinostominin başarı oranı üzerine etkisi

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Abstract

Aim: To evaluate the outcomes of transcanalicular diode laser DCR (TL-DCR) in patients with chronic dacryostenosis.

Methods: In this retrospective study we included 75 eyes of 67 patients with chronic dacryostenosis who underwent TL-DCR. In 65 patients transnasal endoscopic debridement the opening and nasalacrimonal syringing was performed every week for 1 month (Group 1, 65 patients). The later patients who did not have postoperative visits were defined as Group 2 (10 patients). All patients were examined at postoperative 3 months.

Results: In group 1, 65 of 63 patients had complete surgical success and two had restenosis. In group 2, six of 10 patients had success however four had restenosis. In group 1 the surgical success rate was 98% whereas it was 60% in group 2 ($p < 0.001$). None of the patients had any serious complications including infection and bleeding.

Conclusions: The surgical success rate of TL-DCR may increase by endoscopic debridement after the surgery.

Keywords: Dacryocystorhinostomy, chronic dacryostenosis, transcanalicular diode laser

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Öz

Amaç: Kronik dakriyostenozlu hastalarda endoskopik transkanaliküler diod lazer ile dakriyosistorinostomi sonuçlarını değerlendirmek.

Yöntemler: Bu retrospektif çalışmaya 67 kronik dakriyostenozlu hastanın transkanaliküler lazer ile dakriyosistorinostomi yapılan 75 gözü dahil edildi. Ameliyat sonrası 65 hastaya nazolakrimal kanal açma ve yıkama için 1 ay boyunca her hafta transnazal endoskopik debridman yapıldı (Grup 1, 65 hasta). Postoperatif bakım yapılmayan hastalar Grup 2 (10 hasta) olarak tanımlandılar. Tüm hastalar en son 3. ayda muayene edildiler.

Bulgular: 1. grupta 65 hastanın 63'ünde tam cerrahi başarı sağlandı, iki hastada restenoz gelişti. 2. grupta 10 hastanın altısında başarı sağlandı, ancak dört hastada restenoz gelişti. 1. Grupta cerrahi başarı oranı %98, 2. grupta ise % 60 idi ($p < 0,001$). Hastaların hiçbirinde ciddi bir komplikasyon, enfeksiyon ve kanama görülmedi.

Sonuç: Ameliyat sonrası transnazal endoskopik debridman yapılması transkanaliküler lazer ile dakriyosistorinostominin başarı oranını arttırabilir.

Anahtar Kelimeler: Dakriyosistorinostomi, kronik dakriyostenoz, transkanaliküler diod lazer.

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Introduction

The main surgical method for the management of nasolacrimal duct obstruction with epiphora is external dacryocystorhinostomy (DCR). In DCR, nasolacrimal sac and the nasal cavity is communicated directly by creating a fistula. The first DCR surgery is presented by Toti et al. [1] in 1904. The surgery was then improved by Dupuy-Dutemps and Bourguet [2] by suturing the nasal and lacrimal mucosa achieving a success rate over 90%. In recent years minimal invasive surgical options have gained popularity due to minimal collateral damage and faster recovery times. These surgical methods include endoscopic endonasal laser and endoscopic transcanalicular laser DCR.

Compared to external DCR, endoscopic DCR has the advantages including the absence of external scar, decreased surgical time, less intraoperative bleeding and more protected lacrimal pump function [3, 4].

The first application of laser was first introduced by Massaro et al. [5] in 1990 using a blue-green light Argon laser in cadavers, than the clinically application was performed by Reifler in 1993 [6]. In 2000, Eloy et al. [7] introduced endoscopic transnasal, transcanalicular diode laser surgery.

In the current study we aimed to report outcomes of endoscopic transcanalicular diode laser DCR (TL-DCR) in patients with chronic dacryostenosis.

Material and methods

In this retrospective study we included 75 eyes of 67 patients with chronic dacryostenosis who underwent TL-DCR between 2010 and 2020 years. The age of patients was between 55-70 years (mean 61 years). All patients having chronic dacryocystitis with obstruction distal to common canaliculus were included in the study. Exclusion criteria were patients younger than included patients younger than 4 years, lacrimal stenosis prior to the common canaliculus, and patients with nasal pathologies like deviated nasal septum.

All patients had preoperative full ophthalmic examination, lacrimal syringing and probing and diagnostic nasal endoscopy.

All surgeries were performed under local anesthesia. Instrument details are 980 nm diode laser (BioLitec; Cream Optec, GmbH, Germany) with 600- μ m laser fiber and 0° rigid nasal endoscope. A 0.5-mm metal stent with guiding wire was introduced through the upper puncta via the canaliculus to reach the medial wall of lacrimal sac until a hard stop was felt. A laser probe was introduced through the stent up to the medial wall of the sac. The infrared target light at the probe end was visualized endoscopically at the lateral wall of the nose. Once ideally positioned in the anteroinferior part of the middle meatus, laser delivery was started in a pulse method. The power setting ranged from 3 to 10 W. Lacrimal sac mucosa, bone, and nasal mucosa were vaporized to create a fistula. The opening was then enlarged by burning the edge in a circular fashion to create a final opening of a minimum of 5 mm diameter (Figure).

In 65 patients transnasal endoscopic debridement the opening and nasal lacrimal syringing was performed every week for 1 month (Group 1, 65 patients). The later patients who did not have postoperative visits were defined as Group 2 (10 patients). All patients were examined at postoperative 3 months. In patients with restenosis, TL DCR was reperfomed. Bicanalicular silicon tube intubation was also performed and was left in position for 3 months.

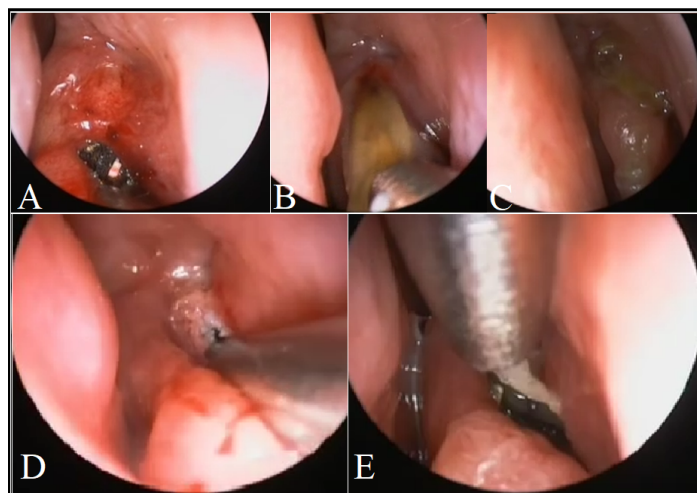


Figure. The opening of the ostium through the nasal cavity intraoperatively (A); posoperative 1 week (B); 2 weeks (C); 3 weeks (D); 4 weeks (E).

Statistical analysis

For descriptive statistics, mean \pm standard deviation was used to give continuous data with normal distribution. Median with minimum-maximum values was applied for continuous variables without normal distribution. Numbers and percentages were used for categorical variables.

The Mann-Whitney U test compared two independent groups where numerical variables had no normal distribution.

The significance level (p-value) was determined at 0.05 in all statistical analyses.

Statistical analyses were performed using SPSS Statistics 17.0 (Statistical Package for Social Sciences for Windows, version 17.0, SPSS Inc., Chicago, U.S., 2008) software package.

Results

In group 1, 65 of 63 patients had complete surgical success and 2 had restenosis. In group 2, six of 10 patients had success; however, four had restenosis. These patients underwent additional TL-DCR and Bicanalicular sialistic intubation. Among these patients 1 had restenosis and this patient was managed with external DCR and complete success was achieved.

None of the patients had any serious complications including infection and bleeding.

The total success rate of TL-DCR was 98%. All the patients had routine day activities after 24 hours. The silicon tubes were removed after 3 months in all patients. At postoperative 1 month all the DCR ostiums were completely opened.

In group 1 the surgical success rate was 98% whereas it was 60% in group 2. The difference between groups was statistically significant ($p < 0.001$).

Discussion

Chronic dacryocystitis is chronic inflammation of lacrimal sac and the main reason is obstruction of nasolacrimal duct. In the absence of treatment cases chronic dacryocystitis may lead to recurrent conjunctival inflammation, dacryocoele, lacrimal sac fistula and orbital cellulitis. External DCR is still accepted as the gold standard option for the management of chronic dacryocystitis. DCR achieves favorable anatomical and functional outcomes however it includes some disadvantages such as

cutaneous scar, prolonged procedure time and per operative bleeding.

Transcanalicular laser assisted DCR is a minimally invasive surgical method compared to external DCR.⁸ The main advantages are the absence of external skin incision and quick postoperative recovery. This surgery also includes the advantages of short learning curve, less surgery time and minimal per-operative bleeding [9, 10].

The success rates of DCR shows differences based on the surgical technique and the surgeon. A variety of studies reported the success rate of external DCR 77% and 100% [11]. In a study Plaza et al. [12] showed a success rate of 88% in TL-DCR. Ajalloueyan et al. [13] reported very similar success rates for external DCR and TL-DCR in a study including 244 patients totally. The success rate was 92% for external DCR and 93% for TL-DCR in their study.

Recently Ozturker et al. [14] compared the outcomes of TL-DCR, endonasal DCR and external DCR. The success rates in their study were 65%, 70% and 84%, respectively. In our study, the success rate for TL-DCR was significantly increased compared to those previously reported. There are some possible explanations for the increased surgical success rate in our study. First is the medicalization of the medium chonca during the operation. Second we have performed our surgery by the assistance of endonasal view which allows the direction of laser probe through the canaliculus correctly and avoid damaging the canaliculus and surrounding tissues. In addition the debridement of ostium wound for every week postoperatively.

The major limitation of this study was the short follow-up period time. Another limitation is the small size of control group. Hence, future study needs to be performed with long-term follow-up and a larger population.

In conclusion, endoscopic debridement after the surgery seems to improve the surgical success rate of TL-DCR. However, our findings should be evaluated in future studies.

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