

An Early Closure of Nasolacrimal Opening with Crust After Multidiod Laser-Assisted Transcanalicular Dacryocystorhinostomy: Case Report

Multidiod Lazer Yardımlı Transkanaliküler Dakriyosistorinostomi Sonrası Nazolakrimal Açıklığın Erken Dönemde Kapanması

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ABSTRACT A 51-year-old woman presented at the eye clinic with epiphora, present for 2 years, due to chronic dacryocystitis of the right lacrimal sac. She received multidiod laser-assisted transcanalicular dacryocystorhinostomy (DCR) with canalicular intubation. Conjunctival culture, preoperatively, and lacrimal sac culture, peroperatively, were taken for microbiological analysis. Although she had no complaints for the first 15 days postoperative, 3 weeks after the surgery she presented with lacrimal sac phlegmone with localized hyperemia, oedema and tenderness. Nasal endoscopic evaluation revealed closure of the sac aperture with a thick crust and patency of the silicone tubing. A needle aspiration of pus from the lacrimal sac with direct percutaneous puncture revealed *Streptococcus viridans*. After endoscopic crust removal and treatment with oral claritromycin all symptoms disappeared. Close follow-up postoperatively is necessary since early closure of the nasolacrimal aperture may occur after laser-assisted DCR due to crusts and synechia with middle turbinate, resulting in dacryocystitis.

Key Words: Dacryocystitis; laser therapy; dacryocystorhinostomy

ÖZET Sağ lakrimal kesenin kronik dakriyosistiti nedeniyle 2 yıldır epifora şikâyeti olan 51 yaşındaki kadın hasta kliniğimize başvurdu. Hastaya multidiod lazer ile transkanaliküler dakriyosistorinostomi (DSR) ve kanaliküler entübasyon uygulandı. Mikrobiyolojik inceleme için ameliyat öncesi konjonktival kültür, ameliyat sırasında ise lakrimal keseden kültür alındı. Ameliyat sonrası ilk 15 günde hiçbir şikâyeti olmayan hastada, ameliyat sonrası 3. haftada, lakrimal kese flegmonu ile birlikte lokalize hiperemi, ödem ve hassasiyet gelişti. Nazal endoskopik muayenede kese açıklığının kalın bir kabukla (krust) örtüldüğü ve silikon tübün yerinde olduğu görüldü. Lakrimal kesenin iğne ile direkt perkutanöz aspirasyonu ile alınan materyalin kültüründe *Streptococcus viridans* ürediği görüldü. Kabuğun endoskopik olarak temizlenmesi ve oral klaritromisin uygulaması sonrasında hastanın tüm şikâyetleri kayboldu. Multidiod lazer yardımı ile yapılan DSR ameliyatı sonrasında, kabuk oluşumu ve orta türbinatla olan yapışıklıklara bağlı olarak nazolakrimal açıklık erken dönemde kapanarak dakriyosistite neden olabileceğinden dolayı, ameliyat sonrası yakın takip gereklidir.

Anahtar Kelimeler: Dakriyosistit; lazer tedavisi; dakriyosistorinostomi

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The infection of the lacrimal sac is usually secondary to the obstruction of the nasolacrimal duct. If obstruction progresses to dacryocystitis, pain and swelling of the lacrimal sac may occur, requiring systemic antibiotics and surgical treatment. Although infection may be treated with systemic antibiotics, recurrence is inevitable unless a patency of the lacrimal system is not provided.¹ Gram positive organisms are the most common cause of dacryocystitis.² The conventional surgical technique for lacrimal system

stenosis described by Toti in 1904 is external dacryocystorhinostomy (DCR); in which an opening is made between the lacrimal sac and the nasal cavity.³ The intranasal approach was described in 1889 by Killian and first performed by Caldwell in 1893.⁴ The developments with different approaches like endoscopic/endocanalicular/transcanalicular techniques with use of different laser systems in performing less traumatic DCR are also described in the literature.⁵ Here, we report a case with chronic dacryocystitis, treated with multidiode laser-assisted transcanalicular DCR (980 nm, 30 Watts) with silicone tube intubation resulting with re-dacryocystitis due to closure of the nasolacrimal opening by crust in the early postoperative period.

CASE REPORT

A 51-year-old woman attended our clinic reporting epiphora in the right eye for 2 years. Exploration revealed a right chronic dacryostenosis with dacryocystocele formation. After informed consent is obtained from the patient, multidiode laser-assisted transcanalicular DCR (980 nm, 30 Watts) with silicone tube intubation was performed under general anesthesia. Conjunctival and lacrimal sac culture was taken for microbiological analysis and a punch biopsy from the lacrimal sac was obtained for pathological examination. Cultures were sterile. Pathological examination revealed chronic inflammation without malignancy. She was put on amoxicilline clavulanic acid (amoklavin bid 1000 mg, Deva, naproxen sodium (aprol%, Bilim), topical netilmycin sulfate (netira, Teka teknik), deksametazone (onadron, IE Ulugay) drops and nasal 0.9% sterile saline solution. On postoperative 15th day, silicone tubing was patent, syringing was positive and she had no complaints of epiphora or secretion. However, three weeks after the surgery she presented with lacrimal sac phlegmone with localized hyperemia, oedema and tenderness. Nasal endoscopic imaging revealed a thick brownish crust, totally covering the osteotomy aperture partially forming synechia with middle turbinate, which clogged the tubes at the bottom of the opening (Figure 1). Maxillofacial tomographic imaging showed a 16 x 13 mm cystic lacrimal sac, with peripheral circular contrast (Figure 2). A needle aspiration of pus from the lacrimal sac



FIGURE 1: An endoscopic view, showing crust formation at the site of osteotomy causing a synechia with middle turbinate (MT) (red arrow). Silicone intubation tubes are blocked at the upper and deep portion of the aperture (black arrow), MT. Middle turbinate.

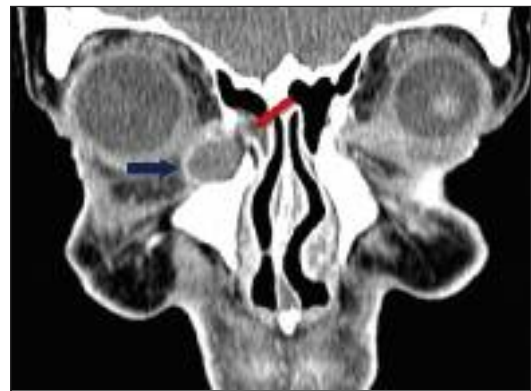


FIGURE 2: Computerized tomography imaging showing lacrimal sac swelling (blue arrow); and patency of osteotomy (red arrow) in the 3rd week postoperative.

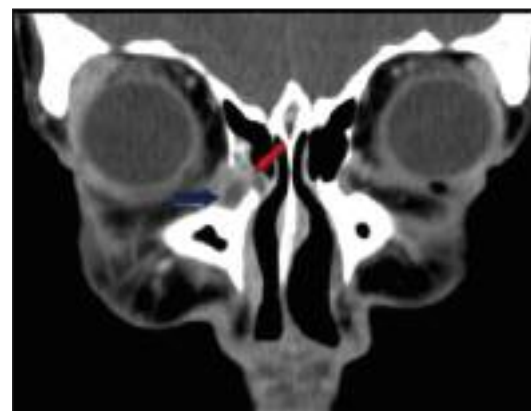


FIGURE 3: Decrease in sac dimensions after 10 day antibiotic therapy and endoscopic removal of the crust (blue arrow); osteotomy aperture of nearly 7 x 6 mm length (red arrow).

with direct percutaneous puncture was performed. Conjunctival swabs from both eyes were sterile while a culture of the lacrimal sac revealed *Streptococcus viridans*. After treatment with oral claritromycin (macrol 500 mg, Sanovel) 2 times a day and removal of the crust, all symptoms disappeared. Control CT revealed dwindling of the sac (Figure 3).

DISCUSSION

Acute dacryocystitis is treated with antibiotics, as well as with direct percutaneous puncture of the lacrimal sac. The pus present in the lacrimal sac is not routinely cultured because the organisms involved in chronic dacryocystitis are usually commensal organisms within the duct, most commonly *Staphylococcus* species; *S. aureus* and *S. epidermidis* being the most frequently encountered organisms.^{2,6}

S. viridans species commonly live around the teeth and may be associated with infective endocarditis, especially in patients with prosthetic heart valves, but are not common in dacryocystitis cases.⁷ Because the success rates are in any case high, up to 83-98% with external DCR, the aim of using lasers with different wavelengths in the field of DCR is to shorten the procedure and recovery time, to decrease complication rate and to avoid skin scarring.⁸⁻¹⁰ Osteotomy is performed by laser energy through an optic fiber, between medial wall of lacrimal sac and nasal cavity. Occlusion of the osteotomy may occur

in some cases either by external or endoscopic approach, due to a submucous membrane or scar tissue. The fibroblast is responsible for scar formation as a response to tissue damage.¹¹ Laser evaporates the surrounding tissues, as well as the lacrimal sac and lacrimal bone, causing fibroblasts to proliferate resulting in the contraction of the granulation tissue. Some of the tissues around the osteotomy site become coagulated, forming a black carbonized crust-like tissue, which are removed during the operation. Saline solution is prescribed routinely to prevent crust formation. Careful and total removal of these devitalized tissues is needed to minimize the risk of obstruction of the osteotomy. In some studies, use of mitomycin-C (MMC) to decrease the risk of re-epithelization at the osteotomy area is also described.^{12,13} MMC was not used in this case. Patients are recommended to use sterile 0.9% saline solution as nasal spray at least 6 times a day for 4-6 weeks, postoperatively. In this case, nasal irrigation was not done properly. Although laser-assisted transcanalicular DCR is a quick and easy procedure necessitating a short recovery time; evaporation of tissues during osteotomy may lead to formation of crust and fibrosis resulting in closure of the osteotomy. Total removal of devitalized tissues preoperatively and proper use of nasal irrigation spray postoperatively may minimize or prevent crust formation and inadvertent closure of the osteotomy which may result with postsurgical dacryocystitis.

REFERENCES

- Altan Yaycioglu R, Pelit A, Aydogan N, Yilmazer C, Aydın Akova Y. [The comparison of the endoscopic and external dacryocystorhinostomy procedures with silicone stent implantation]. *Turkiye Klinikleri J Ophthalmol* 2004;13(4):199-204.
- Chaudhry IA, Shamsi FA, Al-Rashed W. Bacteriology of chronic dacryocystitis in a tertiary eye care center. *Ophthal Plast Reconstr Surg* 2005;21(3): 207-10.
- Gunduz A. Evaluation of the relationship between the sac size in lipidol dacryocystography and surgical success of external dacryocystorhinostomy. *Turkiye Klinikleri J Ophthalmol* 2004;13(3):134-7.
- Mahmood S, Sadiq A. A short history of lacrimal surgery. *CME J Ophthalmol* 2001;5(3):76-8.
- Yalcin M. [New approaches in nasolacrimal duct surgery]. *Turkiye Klinikleri J Ophthalmol* 1996;5(4): 398-403.
- Hurwitz JJ. Diseases of the sac and the duct. *The Lacrimal System*. 1sted. Philadelphia, Pa: Lippincott-Raven; 1996. p.124.
- Bayliss R, Clarke C, Oakley C, Somerville W, Whitfield AG. The teeth and infective endocarditis. *Br Heart J* 1983;50(6):506-12.
- Ucgun NI, Hosal MB, Gursel E. [Dacryocystorhinostomy: surgical results and the factors affecting the success]. *Turkiye Klinikleri J Ophthalmol* 2000; 9(4): 225-9.
- Tok O, Burakgazi AZ, Akbas Kocaoğlu F, Ornek F. [Results of external dacryocystorhinostomy and reasons of failure]. *Turkiye Klinikleri J Ophthalmol* 2007;16(3):159-62.
- Tarbet KJ, Custer PL. External dacryocystorhinostomy surgical success, patient satisfaction and economic cost. *Ophthalmology* 1995;102 (7):1065-70.
- Ross R. The fibroblast and wound repair. *Biol Rev Camb Philos Soc* 1968;43(1):51-96.
- Avunduk AM, Isik AU, Kapıcıoğlu Z, Turk A. [Results of endoscopic endonasal dacryocystorhinostomy]. *Turkiye Klinikleri J Ophthalmol* 2005;14(3): 105-9.
- Ari S, Gun R, Surmeli S, Atay AE, Caca I. Use of adjunctive mitomycin C in external dacryocystorhinostomy surgery compared with surgery alone in patients with nasolacrimal duct obstruction: A prospective, double-masked, randomized, controlled trial. *Curr Ther Res* 2009;70(4):267-73.