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Endoscopic dacryocystorhinostomy as treatment for lacrimal pathway obstructions: Serial case reports

Dacriocistorrinostomía endoscópica como tratamiento de las obstrucciones de la vía lagrimal: presentación de serie de casos

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SUMMARY

Introduction: *The lacrimal system is an important system for maintaining the normal condition of the ocular surface. Obstruction of the lacrimal duct can lead to inflammation and accumulation of debris and pathogens such as bacteria or fungi in the lacrimal sac and then cause dacryocystitis. This disease is often found in children or adults over 40 years of age, especially women with a peak incidence at the age of 60 to 70 years. Complaints usually include eye discomfort and redness accompanied by excessive tears. The diagnosis can be made based on physical examination, staining tests, and imaging photographs, such as dacryocystography, computed tomography (CT), and magnetic resonance imaging (MRI). Management of dacryocystitis is conservative, supportive, and surgical with an open or endonasal approach.* **Serial case report:** *Three cases of dacryocystitis with various lacrimal pathway obstructions were reported. The patients generally complained of a lump on the medial part of the eye accompanied by hyper lacrimation without visual disturbance. Two cases were reported with pus and blood discharge from the lump. All cases underwent endoscopic dacryocystorhinostomy with silicone stenting.* **Conclusion***: Dacryocystitis is a rare case and requires appropriate and adequate management. Endoscopic dacryocystorhinostomy gives satisfactory results with a rare recurrence rate. In addition, endoscopic dacryocystorhinostomy has cosmetic advantages when compared to external dacryocystorhinostomy.*

Keywords: *Endoscopic dacryocystorhinostomy, therapy, lacrimal pathway obstruction, case series.*

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RESUMEN

Introducción*: El sistema lagrimal es un sistema importante para el mantenimiento del estado normal de la superficie ocular. La obstrucción del conducto lagrimal puede provocar inflamación y acumulación de desechos y patógenos como bacterias u hongos en el saco lagrimal y luego causar dacriocistitis. Esta enfermedad se encuentra a menudo en niños o adultos mayores de 40 años, especialmente en mujeres con un pico de incidencia a la edad de 60 a 70 años. Las quejas suelen incluir molestias en los ojos y enrojecimiento acompañados de lágrimas excesivas. El diagnóstico se puede hacer con base en el examen físico, las pruebas de tinción y las fotografías de imágenes, como la dacriocistografía, la tomografía computarizada (TC) y la resonancia magnética nuclear (RMN). El manejo de la dacriocistitis es conservador, de apoyo*

y quirúrgico con abordaje abierto o endonasal. **Reporte de caso serial:** *Se reportaron tres casos de dacriocistitis con varias obstrucciones de la vía lagrimal. Los pacientes generalmente se quejaban de un bulto en la parte medial del ojo acompañado de hiperlagrimeo sin alteración visual. Se informaron dos casos con pus y secreción de sangre del bulto. En todos los casos se realizó dacriocistorrinostomía endoscópica con stent de silicona*. **Conclusión:** *La dacriocistitis es un caso raro y requiere un manejo apropiado y adecuado. La dacriocistorrinostomía endoscópica da resultados satisfactorios con una rara tasa de recurrencia. Además, la dacriocistorrinostomía endoscópica tiene ventajas cosméticas en comparación con la dacriocistorrinostomía externa*.

Palabras clave: *Dacriocistorrinostomía endoscópica, terapia, obstrucción de la vía lagrimal, serie de casos*.

INTRODUCTION

Dacryocystitis is a bacterial or fungal infection of the nasolacrimal sac, caused by obstruction of the nasolacrimal duct and tear stasis in the lacrimal drainage system (1). Anatomical variations, abnormal structure of the lacrimal system, and other abnormalities such as nasal septal deviation, nasal polyps, or allergic rhinitis make a person more susceptible to dacryocystitis (2).

Dacryocystitis can be caused by both Gram-positive and Gram-negative bacteria. Gram-positive bacteria *Staphylococcus aureus* is the main cause of infection in acute dacryocystitis, while Coagulase Negative-Staphylococcus is the main cause of infection in chronic dacryocystitis (3). The primary etiology of dacryocystitis is an obstruction of the nasolacrimal duct which invites a secondary etiology of infection (4,5). There are 3 stages of secretion formation in dacryocystitis. This can be recognized by massaging the lacrimal sac. These stages include obstruction, infection, and cicatricial stages (5).

The diagnosis of dacryocystitis can be established from the examination of staining tests, such as the Fluorescence Test and the Jones Test (1,2,6). Dacryocytography is the administration of radioopaque contrast with images taken to confirm the exact location of lacrimal drainage obstruction (6). Computed tomography (CT) and magnetic resonance imaging (MRI) are chosen as additional examinations especially when abnormalities in the paranasal sinuses or lacrimal sacs are suspected (7).

Approach to dacryocystorhinostomy (DCR) through two methods, namely external DCR (EXT-DCR) and endoscopic DCR (EN-DCR) (7,8). The action performed in the EN-DCR method is through the nasal cavity using a nasal endoscope (8). The EN-DCR approach has several advantages when compared to EXT-DCR. The advantages are minimal trauma and no scarring in the facial area, less interference with the lacrimal pump function, and simpler, easier, and faster action (9,10). Here, three cases of dacryocystitis with various obstruction locations in the lacrimal pathway are reported which were successfully treated with endoscopic dacryocystorhinostomy.

CASE REPORT

CASE I

A 30-year-old woman was consulted by an ophthalmologist with a chief complaint of frequent tears from the right eye for the last 2 months accompanied by pus and blood discharge. The lump feels painful when pressed. The patient has received therapy ophthalmologist for 2 weeks, but there has been no improvement.

Physical examination revealed a soft lump on the right media canthus which was slightly painful when pressed. The visual acuity of both eyes was 20/25, and the motion of the eyeballs was within normal limits. Anterior rhinoscopy, otoscopy, and pharyngoscopy revealed no abnormalities.

Dacryocystography showed obstruction of the lacrimal canaliculus superior et inferior oculi dextra. From the results of the history, physical examination, and supporting examinations obtained, a diagnosis of dacryocystitis was concluded, then surgery was planned for EN-DCR.

The patient was seen one week after surgery in the outpatient department. The patient did not complain of any significant symptoms in the eyes or nose. There was no lump in the media canthus area, and the stents were well placed.

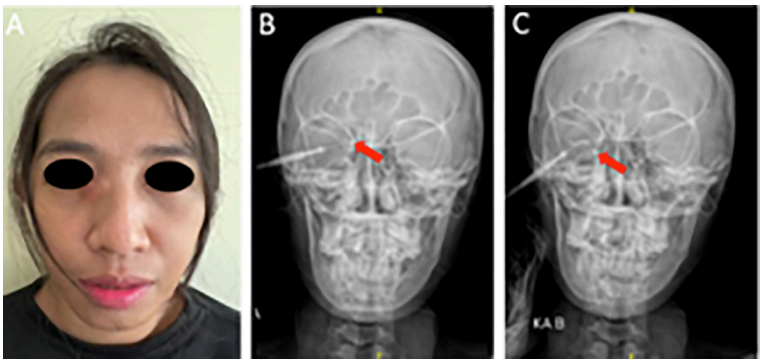

Figure 1. (A) Clinical picture of the patient, (B, C) Fistulography; complete obstruction at the level of the lacrimal canal dextra (red arrow).

CASE II

The Ophthalmology Department consulted a 28-year-old man with a chief complaint of frequent white discharge in the media canthus of the left eye for about 1 year accompanied by a small lump and pain.

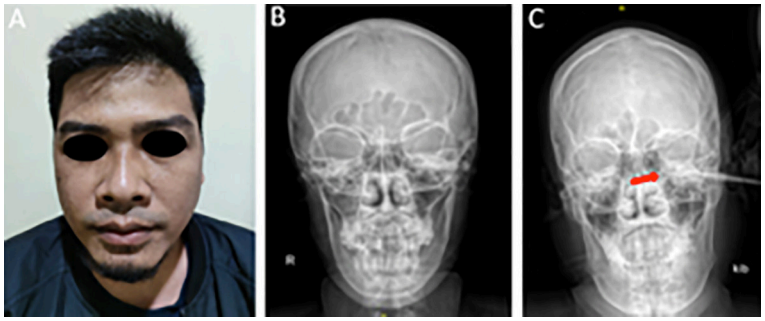

Figure 2. (A) Clinical picture of the patient, (B, C) Fistulography; obstruction of the inferior lacrimal canal sinistra (red arrow).

Physical examination showed a small lump with soft consistency on the inferior cantus media of the left eye accompanied by whitish secretion when the lump was pressed. The visual examination in both eyes was 20/20, and the motion of the eyeballs was within normal limits. Anterior rhinoscopy, otoscopy, and pharyngoscopy examination revealed no abnormalities.

Dacryocystography showed obstruction of the inferior lacrimal canaliculus oculi sinistra. From the results of the history and physical examination and additional examinations obtained, a diagnosis of dacryocystitis was concluded, then surgery was planned with the ophthalmologist for EN-DCR.

The patient was given board-spectrum antibiotics and analgesics after surgery. The patient was discharged two days later and can continue to control at the outpatient clinic.

CASE III

The patient was consulted by an ophthalmologist with chief complaints of discomfort in the left eye accompanied by excessive tears.

Complaints began to be felt since experiencing a traffic accident about 2 years ago. At that time, the patient underwent ORIF surgery to treat multiple maxillofacial fractures.

Physical examination showed a lump in the lacrimal sac and hypersecretion in the left eye. The visual acuity was 20/25 in the left eye and 20/50 in the right eye. The face appeared asymmetrical, the right media canthus angle was reduced, and malar flattening, and nasal deviation to the left. Nasal endoscopic examination showed deviated septum and conchal hypertrophy narrowing the nasal cavity and osteomeatal complex.

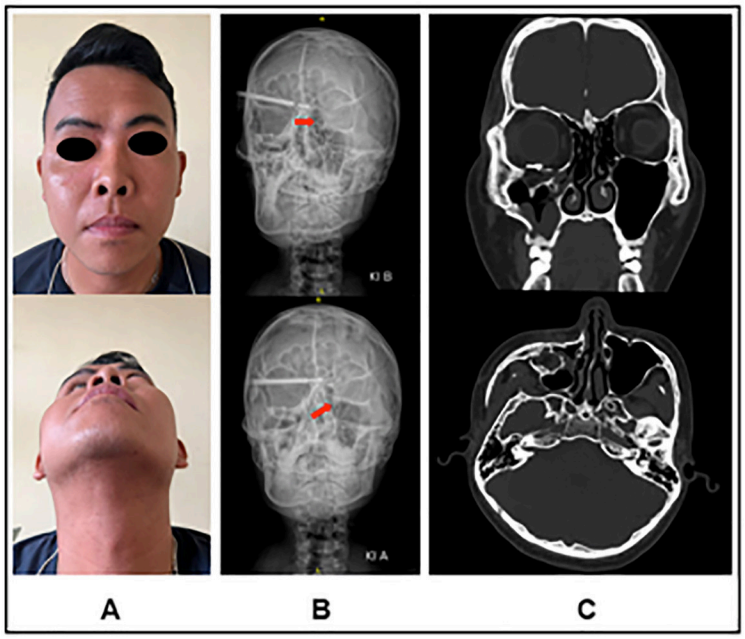

Figure 3. (A) Clinical pictures showed facial asymmetry and malar flattening (B) Fistulography with obstruction of the sinistra lacrimal sac (red arrow), (C) Non-contrast CT scan with an old fracture on the superior and inferior walls of the orbita, zygoma arch, nasal os, septal deviation, and lateral wall of the maxilla.

The results of dacryocystography showed obstruction of the lacrimal sac oculi sinistra. Non-contrast CT-Scan with multiple fractures of the orbital wall, maxillary wall, zygoma arch, nasal bone, and type III septal deviation. From the results of the examinations, a diagnosis of traumatic dacryocystitis was concluded, and joint surgery with the ophthalmologist was planned for EN-DCR.

The patient was seen in the outpatient clinic one week after surgery, and the results were satisfactory. It was planned to remove the silicone stent 3 months later.

DISCUSSION

Common complaints felt by patients are discomfort in the eyes, redness accompanied by hypersecretion, and lumps in the cantus media (1,2). According to Linberg and McCormick, the classification of nasolacrimal duct obstruction is divided into primary and secondary. Primary dacryocystitis is caused by inflammation or fibrosis without a known cause, with an incidence ratio of 3:1 in young adult women compared to older ones. Secondary dacryocystitis is caused by inflammation

and fibrosis with causes such as infection, inflammation, neoplasm, trauma, or mechanical factors (4,10).

The primary aetiology of dacryocystitis is an obstruction of the nasolacrimal duct which invites a secondary aetiology of infection (8). Most cases of nasolacrimal duct obstruction are found in old age, usually as a result of chronic mucosal degeneration, ductal stenosis, tear stagnancy, and bacterial overgrowth (4). The most commonly isolated gram-positive organisms are *Staphylococcus aureu*s and *Streptococcus*, while the most commonly found gram-negative organisms from bacterial isolation results are: *Pseudomonas aeruginous*, *Fusobacterium, Haemophilus influenza* (3).

A staining test was performed to see the patency of the lacrimal drainage (1,2,6). The fluorescent test uses 1 %-2 % fluorescent which is dripped on both conjunctival fornices, where in normal conditions within 5-10 minutes the dye will no longer appear (6). Dacryocytography is the act of administering radioopaque contrast by injection (ethiozed oil) into the canaliculi and then taking pictures. It is indicated to confirm the exact location of lacrimal drainage obstruction for surgery (6). Computed tomography (CT) and magnetic resonance imaging (MRI) are chosen as additional investigations in lacrimal obstruction, especially when abnormalities in the paranasal sinuses or lacrimal sacs are suspected (7).

A dacryocystorhinostomy (DCR) is a procedure that creates an opening in the wall of the nasolacrimal duct so that there is a direct connection between the tear drainage system and the nasal cavity (7,8). In the past, DCR was an external surgical procedure with an approach through the skin near the bridge of the nose. This technique can be performed by making a passageway from the lateral wall of the nasal cavity to the nasolacrimal duct to create a direct connection between the two, known as the Toti procedure (7).

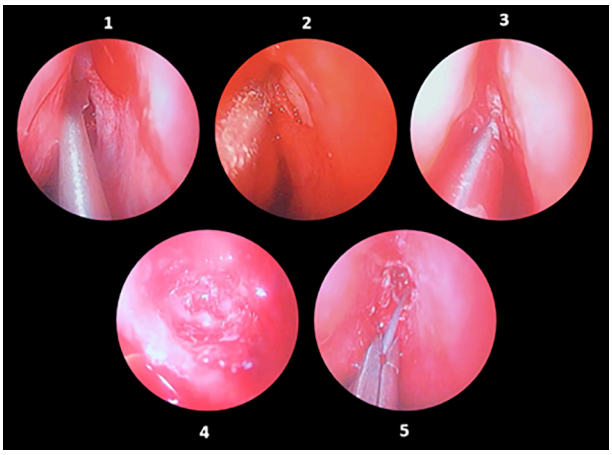

Figure 4. EN-DCR procedure. (1) Incision at the anterior maxillary line. (2) Elevate the mucosa up to the lacrimal bone. (3,4) Drill the lacrimal bone until the lacrimal sac is exposed. (5) Stenting of the lacrimal punctum by the ophthalmologist.

Figure 5. Silicone stenting of the lacrimal punctum to maintain lacrimal drainage patency.

The endonasal dacryocystorhinostomy (EN-DCR) method is the first choice and primary procedure performed in patients with acute dacryocystitis. The main reason for this is that this method is able to demonstrate adequate and sustained abscess flow from the lacrimal system, which will accelerate the recovery process from inflammation and symptoms previously experienced by the patient (9,10). Postoperative care is very important to avoid failure and reduce the recurrence rate. Some of the things that must be followed up on postoperatively are the silicone stents that have been installed, the nasal cavity, and other complaints that arise postoperatively (10). The installed silicone stent is maintained for 3 months to prevent recurrence (9).

CONCLUSION

The endoscopic internal approach gives excellent results and is aesthetically more favorable than the external approach. In all three cases, endoscopic dacryocystorhinostomy with silicone stenting was performed and the results were satisfactory.

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