



A Rare Case of Bilateral Chronic Dacryocystitis: Due to Punctum Stenosis and Nasolacrimal Duct Obstruction After Onset Thermal Injury

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Abstract

Chronic dacryocystitis is inflammation of the lacrimal sac caused by obstruction of the lacrimal drainage system. The condition often causes chronic epiphora, pain, swelling and recurrent infection. Thermal trauma is a rare but significant cause of chronic dacryocystitis, which contributes to fibrosis and progressive obstruction. This case report brings to light a rare presentation of bilateral chronic dacryocystitis due to childhood thermal trauma. A 24-year-old woman presented with complaints of lumps on both lower eyelids with acute exacerbation of pain, swelling and redness in the right eye and epiphora. The patient had a history of facial burns from fireworks sparks when she was 10 years old, which was suspected to cause bilateral punctum stenosis. Clinical examination revealed punctum stenosis and imaging confirmed bilateral chronic dacryocystitis with significant obstruction of the lacrimal drainage. External dacryocystorhinostomy (DCR) procedure with silicone tube insertion was planned as the definitive therapy to restore lacrimal drainage. Chronic dacryocystitis due to thermal trauma is a rare condition involving progressive fibrosis and obstruction of the lacrimal drainage system. Prolonged obstruction increases the risk of recurrent infection and psychosocial consequences due to facial deformity. External DCR, with a success rate of up to 95%, is the main therapeutic option to restore lacrimal drainage function. Bilateral chronic dacryocystitis due to childhood thermal trauma is a rare and complex condition that requires early diagnosis and evidence-based therapy. External DCR is an effective intervention to restore function and improve patients' quality of life.

Introduction

Dacryocystitis is an inflammation of the lacrimal sac caused by obstruction of the lacrimal drainage system. This condition often causes chronic epiphora, pain, swelling, and predisposes to recurrent infections (Alsuhailani, 2024). According to the American Academy of Ophthalmology (2020), epiphora accounts for approximately 3% of total ophthalmology clinical visits, making it one of the most significant yet often overlooked ophthalmologic complaints with an impact on patients' quality of life (Sweeney et al., 2020; Schulz & Malhotra, 2022; Abazaga & Fechtner, 2024; Dolar-Szczasny et al., 2023).

Thermal trauma is one of the rarely reported causes of chronic dacryocystitis, although its impact is significant (Ahmed, 2006; Schaefer, 2015; Li et al., 2022). Burns to the facial area can lead to soft tissue fibrosis, punctum stenosis and progressive obstruction of the lacrimal

drainage system (Schaefer & Schaefer, 2020). Based on a report by Kashkouli et al. (2012), canalicular obstruction was found in approximately 16- 25% of patients with obstructive epiphora. Further research by Badhu et al. (2005) showed that women are more often diagnosed with chronic dacryocystitis than men, with the prevalence reaching 67.6 percent. In addition, the incidence of chronic dacryocystitis was higher in subtropical regions with a monsoon climate, suggesting the role of geographical and environmental factors (Badhu et al., 2005; Rodrigues et al., 2022; Eldesoky et al., 2012).

Diagnostic evaluation of dacryocystitis requires a comprehensive approach (Pinar-Sueiro et al., 2012; Harris et al., 2020). Slit lamp examination is used to identify punctum stenosis or obstruction, while fluorescein dye test helps assess the patency of the lacrimal drainage system. Imaging such as dacryocystography or computed tomography (CT) is also an important tool to determine the location and extent of obstruction (Barna et al., 2019; Qian et al., 2023; Tschopp et al., 2014).

The management of dacryocystitis kro Ali et al. (2020) tnis that is unresponsive to conservative therapy involves a dacryocystorhinostomy (DCR) procedure. Based on a report Steele (2016), this technique has a success rate of up to 88.6%, especially in cases without canalicular complications. This approach provides an effective solution, especially for patients with a history of trauma or distal obstruction due to chronic inflammation (Diaz et al., 2008; Scaglione et al., 2022).

This case report addresses a topic rarely documented in the international literature, namely bilateral chronic dacryocystitis due to childhood thermal trauma. It is hoped that the publication of this case will provide additional insights for clinicians and assist in the management of similar complex cases in the future.

Methods

A 24-year-old woman presented with a chief complaint of lumps on the right and left eyelids that had been present since the age of 10. Ten days before admission, the patient complained of throbbing pain, enlargement, and redness of the lump on the right eye. In addition, the patient also reported chronic epiphora and mucopurulent discharge in both eyes, which had become more frequent in recent years. The patient had a history of thermal trauma due to fireworks sparks in the facial area, especially the eyes, at the age of 10, which caused injury to both eyes, but did not receive medical treatment at that time. There was no history of additional trauma, previous surgery to the eye area, or history of systemic diseases such as diabetes mellitus or hypertension that could predispose to chronic infection.



Figure 1. View of the mass on the lower eyelid

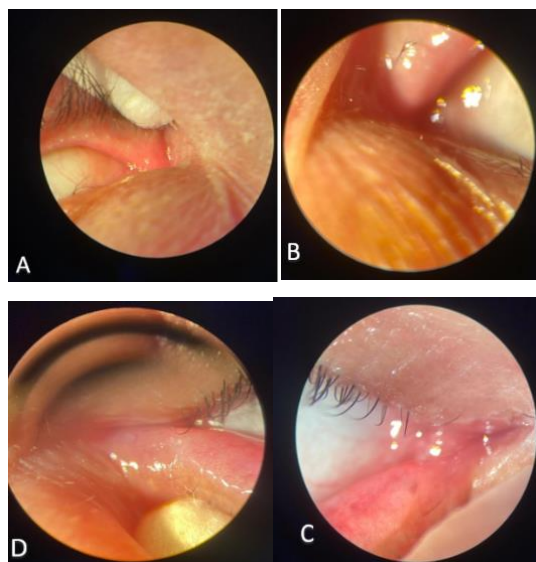


Figure 2. Slit lamp examination results (A) Superior punctum OD (B) Superior punctum OS (C) Inferior punctum OD (D) Inferior punctum OS

On physical examination, the patient's vision was impaired, with VOD 6/30 and VOS 6/30. In the right eye (OD), a $\pm 3 \times 3$ cm nodular lesion was found in the dextra nasal area with a soft consistency, hyperemia, and positive tenderness. The inferior punctum OD appeared stenosed, while the superior punctum OD showed signs of stenosis. In the left eye (OS), there was a $\pm 2 \times 2$ cm nodular lesion in the nasal area sinistra with a soft consistency, minimal hyperemia, and no tenderness. The superior and inferior punctum of the OS showed signs of stenosis. Supportive examination with fluorescein dye test showed tear meniscus sign in both eyes indicating impaired lacrimal flow. Transillumination results were also positive in both eyes. CT scan of the orbits with contrast revealed bilateral chronic dacryocystitis, deviation of the septum of rice, bilateral chronic mastoiditis, and no hypertrophy of the nasal concha, while there were no hypodense lesions in the paranasal sinuses.

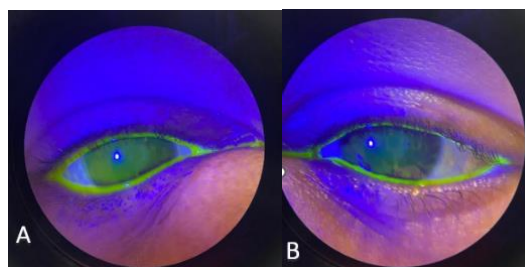


Figure 3. Fluorescein dye examination obtained bilateral tear meniscus sign (A) Oculi Dextra (B) Sinistra Oculi

Based on the examination, the patient was diagnosed with bilateral chronic dacryocystitis with acute exacerbation in the right eye due to nasolacrimal duct obstruction (NLDO) with punctum stenosis in both eyes due to childhood thermal trauma. The condition was characterized by significant swelling in the medial canthus region of the right eye with signs of inflammation. Medicamentous therapy was given to the patient first to address the acute problem. Systemic therapy included the administration of ampicillin-sulbactam 1.5 g intravenously three times a day to treat the bacterial infection, methylprednisolone 125 mg intravenously four times a day to relieve severe inflammation, ranitidine 50 mg intravenously twice a day for gastric protection due to the use of high-dose corticosteroids, and mecobalamin 500 mcg intramuscularly once a day to support tissue repair. Topical therapy included a combination of antibiotics neomycin sulfate and polymyxin B sulfate with corticosteroid dexamethasone in the

form of eye drops four times a day to control local infection and inflammation, and artificial tears eye drops to keep the eye moist and prevent additional irritation.

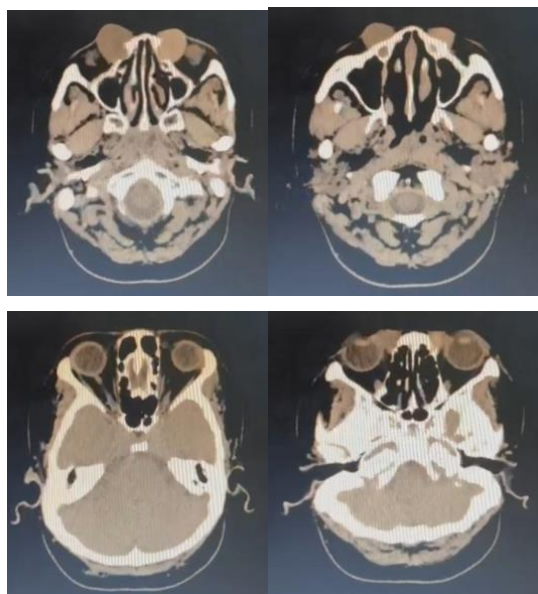


Figure 4. CT scan of the orbits with contrast

The further plan of action after medical therapy for the patient was an external dacryocystorhinostomy (DCR) procedure with silicone tube insertion in both eyes. This procedure aims to create a new drainage channel between the lacrimal sac and the nasal cavity and improve the impaired lacrimal drainage function. This was planned after the patient's acute inflammatory condition was well controlled. High-dose corticosteroid therapy is administered during the procedure preparation period with close monitoring to prevent side effects such as hyperglycemia or other complications.

Result and Discussion

Bilateral chronic dacryocystitis due to thermal trauma is a rare condition that requires special attention in diagnosis and therapy. A thorough understanding of the pathophysiology of this disease is essential to ensure an appropriate management approach.

In this case report, a 24-year-old female patient had bilateral chronic dacryocystitis aggravated by childhood thermal trauma. Thermal trauma triggered soft tissue damage to the lacrimal drainage system, leading to inflammation, fibrosis and multiple stenosis. According to Steele (2016), uncontrolled inflammation due to trauma can result in fibrin deposits and scar tissue formation, which worsens lacrimal duct obstruction. Soebagjo (2020) explains that trauma often triggers a secondary inflammatory response that accelerates this pathological process, resulting in permanent structural changes to the lacrimal duct.

The tear stagnation that occurs due to bilateral obstruction creates an ideal environment for the growth of pathogenic microorganisms, thus increasing the risk of recurrent infection. Landani & Himayani (2020) asserts that untreated lacrimal duct obstruction often progresses to complex chronic dacryocystitis. In this case, the punctum stenosis found in both eyes of the patient reinforced the diagnosis of bilateral chronic dacryocystitis of acute exacerbation.

The treatment option for this patient was external dacryocystorhinostomy (DCR) with silicone tube insertion in both eyes. This procedure allows direct visualization of the obstruction area, as well as optimal reconstruction to ensure adequate lacrimal drainage. Based on research Abbasoglu et al. (1996), the success rate of external DCR reaches up to 95%, especially in cases with a history of trauma. Steele (2016) also highlighted the importance of silicone tube

insertion in maintaining duct patency during the healing phase to prevent scar tissue contraction.

Additional examination using fluorescein dye test showed tear meniscus sign in both eyes, indicating significant lacrimal flow disturbance. In addition, contrast-enhanced CT scan of the orbits revealed bilateral chronic dacryocystitis, deviation of the septum nasi, and bilateral chronic mastoiditis, but without hypodense lesions in the paranasal sinuses. These findings demonstrate the complexity of the pathology that requires a multidisciplinary approach to management.

The psychosocial impact of bilateral chronic dacryocystitis also needs to be considered. The resulting facial deformities, such as enlarged nodular and hyperemic lesions, can significantly affect the patient's quality of life. Meng et al. (2023) emphasized the importance of psychosocial support as an integral part of patient management, especially to restore their social and emotional functioning.

This case report makes a significant contribution to the international ophthalmology literature by highlighting the importance of early diagnosis, comprehensive evaluation and evidence-based therapy. With this publication, it is hoped that clinicians will be better guided in managing cases of bilateral chronic dacryocystitis due to thermal trauma, especially in the context of a complex disease that is rarely reported.

Conclusion

Bilateral dacryocystitis due to childhood thermal trauma is a rare condition that can result in obstruction of the lacrimal drainage system, chronic inflammation and a significant risk of recurrent infection. A thorough diagnostic approach and evidence-based therapies, such as dacryocystorhinostomy (DCR), are effective in addressing the complexities of this condition. This publication is expected to improve clinicians' understanding of the pathophysiology and management of complex dacryocystitis, as well as provide valuable insights in the management of similar cases in the future.

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