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A Rare Case of Bilateral Chronic Dacryocystitis: Secondary to Punctal Stenosis and Nasolacrimal Duct Obstruction Following Delayed-Onset Thermal Injury

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Abstract

Chronic dacryocystitis represents an ordinary ophthalmologic condition that develops when the lacrimal drainage pathways become blocked thus causing ongoing epiphora and continuous painful swelling and persistent infections. Onset of blockages more frequently results from idiopathic reasons but damage to the lacrimal pathways by thermal injuries stands as an important yet unrecognized factor that leads to major clinical outcomes. Early burn treatment of the face around the eyes can trigger progressive tissue scarring of lacrimal passages that might cause long-term blockages as well as infection development. A rare case of bilateral chronic dacryocystitis exists in a 24-year-old female because she neglected facial thermal trauma she experienced during childhood. The patient experienced persistent symptoms including epiphora in both eyes together with swelling at the inner corners of her eyes and drainage consisting of mucus and pus. Both of her tear duct puncta appeared narrow while the medial corners of her eyes showed small areas of swelling. The fluorescein dye disappearance test established severe blockage in both lacrimal ducts. CT contrast imaging showed that the bilateral lacrimal sacs were enlarged while simultaneously revealing duct obstruction together with no evidence of sinonasal mass lesions. The Staphylococcus aureus with low-grade Pseudomonas aeruginosa demonstrated in microbiological culture results while elevated inflammatory markers showed systemic inflammatory activation. The patient received systemic antibiotics and corticosteroids that led to remarkable clinical improvement before surgical planning could begin. The definitive treatment chosen was external dacryocystorhinostomy (DCR) using silicone tube intubation because severe fibrosis together with septal deviation required treatment alongside polymicrobial colonization.

Introduction

A rare case of bilateral chronic dacryocystitis exists in a 24-year-old female because she neglected facial thermal trauma she experienced during childhood. The patient experienced persistent symptoms including epiphora in both eyes together with swelling at the inner corners of her eyes and drainage consisting of mucus and pus. Both of her tear duct puncta appeared narrow while the medial corners of her eyes showed small areas of swelling. The fluorescein dye disappearance test established severe blockage in both lacrimal ducts. CT contrast imaging showed that the bilateral lacrimal sacs were enlarged while simultaneously revealing duct obstruction together with no evidence of sinonasal mass lesions (Ancuța et al., 2024;

Moldovan, 2024. The Staphylococcus aureus with low-grade Pseudomonas aeruginosa demonstrated in microbiological culture results while elevated inflammatory markers showed systemic inflammatory activation. The patient received systemic antibiotics and corticosteroids that led to remarkable clinical improvement before surgical planning could begin. The definitive treatment chosen was external dacryocystorhinostomy (DCR) using silicone tube intubation because severe fibrosis together with septal deviation required treatment alongside polymicrobial colonization. External dacryocystorhinostomy with silicone tube intubation functions as the primary treatment for complex trauma-associated dacryocystitis patients since it achieves proper drainage and helps patients regain emotional well-being. Data from epidemiological studies found epiphora-related complaints occur in 3% of all ophthalmological consultations showing the importance of lacrimal drainage dysfunction in medical care (Sweeney et al., 2020; Schulz & Malhotra, 2022; Dolar-Szczasny et al., 2023).

PANDO stands as the main cause of nasolacrimal duct obstruction in adults although healthcare professionals now recognize a rising frequency of various other potential causes (Pinar-Sueiro et al., 2012; Harris et al., 2020; Razaq, 2024). Thermal injuries represent a particular yet understudied cause of trauma-related dacryocystitis disorders among other conditions. Initial epithelial damage from any type of thermal trauma including flames, chemicals and scorching results in inflammatory responses that might eventually trigger fibrosis in eye drainage tubes (Schaefer 2015, Schaefer & Schaefer 2020). The puncta along with canaliculi display a high risk of scar formation in periocular burns and the nasolacrimal duct may develop complete closure that causes ongoing tear stagnation and subsequent infections (Li et al., 2022; Soebagjo, 2020; Ahmed, 2006; Farahani & Farid, 2021). Pathological processes develop stealthily because people fail to detect important anatomical changes until damage becomes extensive.

Lacrimal system complications after periocular burns require immediate medical care to prevent their delayed onset. Proper acute periocular injury treatment with irrigation along with anti-inflammatory therapy and attentive monitoring minimizes morbidity yet patients who are not treated this way can develop chronic dacryocystitis according to research findings (Sweeney et al., 2020; Badhu et al., 2005). A significant proportion of patients with symptomatic epiphora at 25% experience its development owing to traumatic damage according to Kashkouli et al. (2012) despite most of these minor burn injuries go undiagnosed initially. A disparity exists between genders in chronic dacryocystitis diagnoses since women consistently suffer more instances than men due to both physical structures and varying healthcare habits (Badhu et al., 2005; Rodrigues et al., 2022; Eldesoky et al., 2012).

A comprehensive examination needs to be done to diagnose dacryocystitis at either its initial stage or as a result of another condition. Fundamental to diagnosis are clinical examinations which show lacrimal sac structural observations through palpation and permit detailed evaluation of the puncta with a slit-lamp system (Pinar-Sueiro et al., 2012). Lacrimal drainage system patency analysis relies on functional examinations which include the fluorescein dye disappearance test (FDDT) for providing objective and rapid non-invasive data that enhances clinical observations (Schulz & Malhotra, 2022; Yazicioglu et al., 2023). Chronic dacryocystitis diagnosis requires accurate obstruction location so imaging tests such as dacryocystography, CT dacryocystography and standard orbital CT scanning are essential to differentiate between idiopathic stenosis, traumatic fibrosis, inflammatory masses or neoplastic processes (Barna et al., 2019; Tschopp et al., 2014; Qian et al., 2023). Multidetector CT scans performed by Eldesoky et al. (2012) showed that they detected undeniable mucosal variations as well as canalicular narrowing which went undetected by clinical exams thus validating pre-surgical radiologic assessments.

The successful treatment approach of chronic dacryocystitis requires knowledge of underlying causes and duration of symptoms together with a thorough understanding of affected nasal structures. The medical treatments prove ineffective so patients require surgical treatment. The

definitive treatment method for all kinds of threatening conditions including complex and traumatic cases relies on external dacryocystorhinostomy surgery (Steele, 2016; Abbasoglu et al., 1996; Soebagjo, 2020; Bhende et al., 2023). External DCR approaches outperform endonasal techniques because they provide practitioners superior lacrimal sac visibility and enhanced capability to make precisely measured bone cuts that becomes essential for complicated surgical patients. The additional application of silicone tube intubation serves to keep surgically made ostia open while healing according to Steele (2016) and Ali et al. (2020), thus minimizing early restenosis risk especially in patients with inflammatory or traumatic conditions.

The medical field has extensively studied chronic dacryocystitis but patterns of bilateral cases due to childhood thermal injuries are extremely uncommon. Most instances of trauma-induced dacryocystitis affect only one eye primarily because injuries do not typically spread throughout both eyelids (Schaefer & Schaefer 2020; Eldesoky et al. 2012). A more severe systemic fibrotic remodeling condition occurs when untreated burns affect both sides of the face equally which shows the destructive potential of not treating facial injuries in an early stage. Researchers and clinicians should dedicate more central attention to the psychosocial effects of chronic dacryocystitis which include stigma and social withdrawal and reduced self-esteem according to Meng et al. (2023) and Dolar-Szczasny et al. (2023).

The authors present this case report because they want to add to existing knowledge about trauma-related lacrimal duct blockages by describing an uncommon instance of recurrent tears caused by childhood scald injuries. It emphasizes the necessity of early ophthalmologic involvement following facial trauma, the critical role of multimodal diagnostic evaluation, and the importance of individualized, evidence-based therapeutic strategies. In doing so, it underscores the broader principle that ophthalmologists must approach lacrimal disease not merely as an anatomical defect to correct but as a dynamic, systemic process deeply intertwined with inflammation, infection, tissue remodeling, and patient-centered outcomes.

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 eyeli

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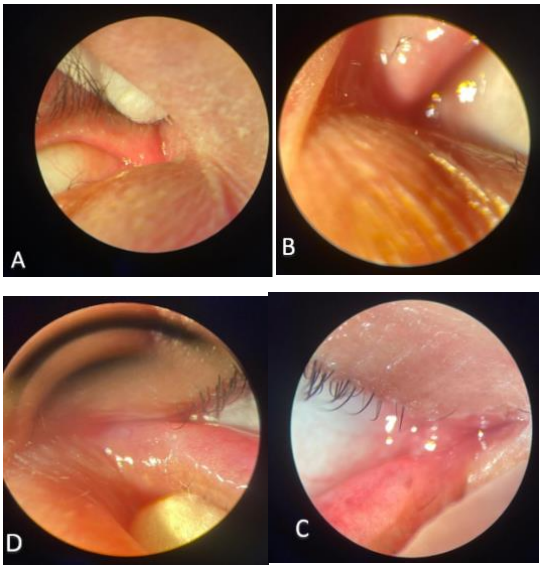

Figure 2. Slit lamp examination results (A) Superior punctum OD (B) Superior punctum OS (C) Inferior punctum OD (D) Inferior punctum OS

On physical examination, the patient's vision was impaired, with VOD 6/30 and VOS 6/30. In the right eye (OD), a ±3×3 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 ±2×2 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 eyesindicating 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.

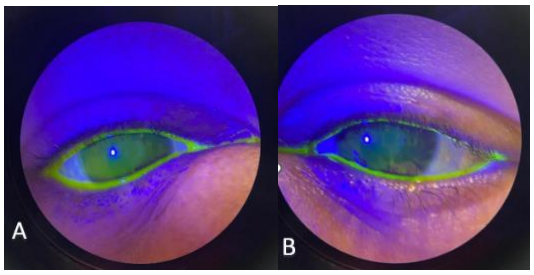

Figure 3. Fluorescein dye examination obtained bilateral tear meniscus sign (A) Oculi Dextra (B) Sinistra Oculi

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

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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.

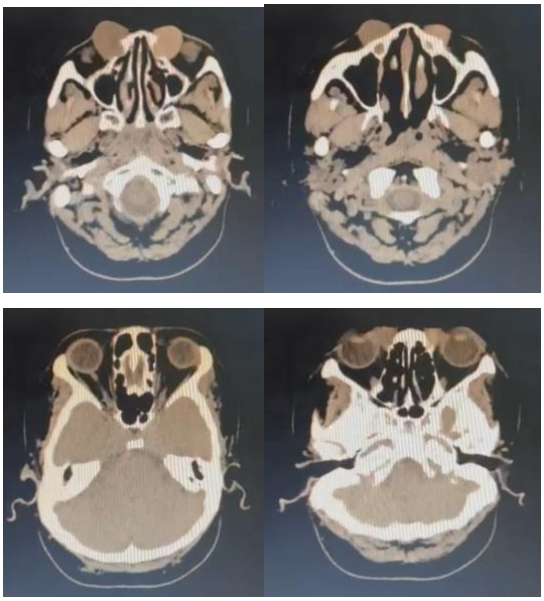

Figure 4. CT scan of the orbits with contrast

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

Clinical Evaluation

The patient, a 24-year-old woman, presented with a history of bilateral lower eyelid swellings, recurrent tearing, pain, and discharge since childhood thermal trauma at age 10. Clinical examination yielded the following findings:

Table 1. Clinical Examination Findings

Parameter	Right Eye (OD)	Left Eye (OS)
Visual Acuity	6/30	6/30
Lesion Size	~3 × 3 cm nodular swelling	~2 × 2 cm nodular swelling
Consistency	Soft, hyperemic, tender	Soft, minimally hyperemic, non-tender
Inferior Punctum	Stenosed	Stenosed
Superior Punctum	Signs of stenosis	Signs of stenosis

A prolonged fibrotic process from injury causes the double-sided lesions and documented punctum stenosis which leads to visual acuity reduction. The right-side lesion blames both chronic inflammation and acute injury because it shows bigger dimensions with stronger inflammatory activities. The soft and tender characteristics of these masses indicate the infected lacrimal sac and sac distension instead of any solid tumor. The occurrence of bilateral punctum stenosis as a symptom of thermal trauma fibrosis shows that the patient's condition spreads throughout the systemic body tissues while exceeding typical infectious manifestations. The identical loss of vision suggests epithora with persistent discharge has made corneal surface

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deterioration likely thus requiring thorough pre- and postoperative corneal protection measures.

Fluorescein Dye Test (FDDT)

To assess the functionality of the lacrimal drainage system, a fluorescein dye disappearance test was performed, revealing the following results:

Table 2. Fluorescein Dye Test Results

Parameter	Right Eye (OD)	Left Eye (OS)
Fluorescein Retention	Positive	Positive
Tear Meniscus Sign	Present	Present
Clearance Time	>5 minutes	>5 minutes

The conclusive evidence showing severe drainage obstruction in both eyes includes positive dye retention together with a clearance time exceeding five minutes. The normal disappearance of fluorescein dye through the tear ducts requires a timeframe of 2-3 minutes. A functional obstruction occurs when dye clearance time reaches beyond 5 minutes which confirms that the drainage system remains totally blocked. The symmetrical test results demonstrate an obstruction of the nasolacrimal duct that matches the clinical pattern of trauma-induced fibrosis over primary infectious or idiopathic causes. The presence of tear stasis which can be diagnosed by the tear meniscus sign creates an environment for microbial growth that raises the chances of developing both chronic infections and acute worsening when the condition remains unoperated.

CT Scan of Orbits

A contrast-enhanced CT scan was obtained to visualize the anatomic integrity of the lacrimal drainage system and surrounding structures:

Table 3. CT Scan Findings

Structure	Finding
Lacrimal Sac	Bilateral enlargement with soft tissue density indicative of chronic inflammation
Nasolacrimal Ducts	Evidence of obstruction
Septum Nasi	Deviated to the right
Mastoid Air Cells	Bilateral chronic mastoiditis
Nasal Concha	No hypertrophy
Paranasal Sinuses	No hypodense lesions

CT imaging confirms diagnosis of bilateral chronic dacryocystitis because it shows sac enlargement and downstream obstruction. The examination results excluded tumors by detecting no space-occupying lesions. Chronic mastoiditis found incidentally shows that this patient has a larger potential for mucosal inflammation indicating either a systemic predisposition or anatomic structure dysfunction.. The septal deviation complicates the surgical landscape, potentially making DCR more technically challenging by narrowing the surgical corridor for osteotomy and increasing postoperative complication risks. Hence, preoperative ENT consultation or simultaneous septoplasty should be considered to optimize surgical success.

Medical Management and Initial Response

The patient was initially managed with systemic and topical medical therapy to control acute inflammation before surgery:

Table 4. Initial Medical Therapy

Therapy Type	Agent	Dosage/Route	Purpose
Antibiotic	Ampicillin-Sulbactam	1.5 g IV TID	Broad-spectrum infection control
Anti-inflammatory	Methylprednisolone	125 mg IV QID	Rapid suppression of inflammation
Gastric Protection	Ranitidine	50 mg IV BID	Prevent corticosteroid-induced gastritis
Neurotrophic Agent	Mecobalamin	500 mcg IM daily	Promote nerve and tissue healing
Topical Combination	Neomycin + Polymyxin B + Dexamethasone	Eye drops QID	Local infection and inflammation control
Artificial Tears	CMC-based drops	PRN	Surface lubrication and epithelial protection

A forceful treatment with antibiotics became necessary because polymicrobial infections frequently occur in cases of chronic dacryocystitis. The application of high-dose corticosteroids worked to rapidly control acute inflammation so that further lacrimal sac expansion could not occur while minimizing surgical area tissue sensitivity. The patient received gastroprotective measures since corticosteroid complications could occur. Locally-applied antibiotics with anti-inflammatory medicine were essential for modifying inflammatory conditions of the eye surface while protecting corneal exposure and preventing ulceration from excessive fluid drainage and discharge. Enhanced tissue repair is the focus of neurotrophic support (mecobalamin) availability since it may facilitate faster postoperative healing and minimize fibrosis formation..

Microbiological Culture Results

Culture of mucopurulent discharge was performed prior to initiation of antibiotics:

Table 5. Microbiological Culture Results

Organism Isolated	Antibiotic Sensitivity
Staphylococcus aureus (MSSA)	Sensitive to Ampicillin-Sulbactam
Pseudomonas aeruginosa (low count)	Sensitive to Ceftazidime
No fungal growth	-

Clinical evidence supports the use of Ampicillin-Sulbactam because medical professionals found Staphylococcus aureus to be a common pathogen in chronic dacryocystitis. The patient showed low Pseudomonas counts which suggest polymicrobial infection yet the selected systemic antibiotics were effective in treatment. No fungal pathogens were detected so the need for medical methods focused on addressing the more simple infectious causes.

Blood Inflammatory Markers

Blood work obtained at admission revealed the following:

Table 6. Inflammatory Marker Results

Marker	Result	Reference Range
C-Reactive Protein (CRP)	14.2 mg/L	<5.0 mg/L
White Blood Cell Count (WBC)	12,500 /µL	4,500–11,000 /µL
Erythrocyte Sedimentation Rate (ESR)	32 mm/hr	<20 mm/hr

The three laboratory results show a complete systemic inflammatory pattern which points to acute infectious exacerbation. Proof of clinical requirements shows the need for immediate systemic antibiotic and anti-inflammatory treatment instead of postponing conservative care.

Wholesale testing of these markers as an infection progresses will offer doctors an objective way to assess therapy outcomes.

Clinical Response to Medical Therapy

Following five days of medical therapy, clinical re-evaluation showed:

Table 7. Clinical Response After Medical Therapy

Parameter	Baseline	After Therapy
Lesion Size (OD)	~3 × 3 cm	~2 × 2 cm
Lesion Size (OS)	~2 × 2 cm	~1.5 × 1.5 cm
Pain Score (VAS 0–10)	7	2
Presence of Discharge	Profuse	Minimal
Conjunctival Hyperemia	Severe	Mild

Therapeutic treatment using systemic medications results in significant improvements of pain symptoms together with reduced swelling and discharge. The essential nature of pre-surgical stabilization benefits both operative bleeding control and infection prevention and it leads to better postoperative outcomes. Objective measurements contribute to confirming clinical improvement by providing data that exceeds the value of subjective descriptions.

Post-Traumatic Bilateral Chronic Dacryocystitis

This research study explores the uncommon development pathway that leads burned face tissue to become bilateral chronic dacryocystitis. From an anatomical perspective the lacrimal drainage system functions as a tear drainage channel but evidence from obstructive trauma cases demonstrates how systemic pathological remodeling affects this system (Schaefer, 2015; Schaefer & Schaefer, 2020). Prolonged inflammatory and fibrotic processes following childhood thermal burn injury caused progressive punctal and nasolacrimal duct fibrosis as per (Li et al., 2022; Ahmed, 2006) in this specific case (Li et al., 2022). Research confirms the occurrence of synchronous wound healing abnormalities since early inflammatory injury much like the observed outcomes yet ophthalmologic trauma literature fails to stress this effect (Sweeney et al., 2020; Badhu et al., 2005). Current research on wound healing models demonstrates that uncontrolled pro-inflammatory cytokines will eventually develop pathological fibrosis which produces excessive fibroblast growth and extensive extracellular matrix formation (Rodrigues et al., 2022; Barna et al., 2019; Savin et al., 2022; Gauthier et al., 2023).

Medical records show that the patient's symptoms including persistent eye water drainage and mucopurulent nasal drainage alongside swollen tissue near the inner lids meet the typical clinical markers for chronic dacryocystitis according to authoritative ophthalmologic publications (Alsuhaibani, 2024; Harris et al., 2020; Dolar-Szczasny et al., 2023). The fluorescein dye disappearance test served as a functional assessment tool to detect impaired lacrimal drainage because it combines minimally invasive procedures with high sensitivity. The retention of dye in both eyes for longer than five minutes after the test indicates advanced disease by showing complete outflow failure (Schulz & Malhotra, 2022; Qian et al., 2023). A diagnosis depended on subjective symptoms combined with objective functional impairment creating a strong case that challenges doctors to combine functional assessment with clinical analysis instead of relying on isolated clinical evaluations.

Medical imaging tests provided medical professionals insight into patient conditions. Images obtained using CT contrast scans showed the complete ductal obstruction of both lacrimal sacs in addition to their enlarged state while no paranasal or sinonasal mass lesions appeared in the scans (Eldesoky et al., 2012; Tschopp et al., 2014). The recorded septal deviation serves important dual purposes because it shows how nasal structure abnormalities increase tear

drainage impediments yet simultaneously makes darcycystorhinostomy surgery more difficult (Barna et al., 2019; Pinar-Sueiro et al., 2012). The discovery of chronic mastoiditis affecting both sides supports recent research which explores systemic mucosal inflammation connections throughout various head and neck areas (Meng et al., 2023; Abazaga & Fechtner, 2024).

Medical testing exposed Staphylococcus aureus along with Pseudomonas aeruginosa as predominant species alongside other low-level microbial contaminate. The complex microbial nature of chronic dacryocystitis has been confirmed by this finding because monobacterial infection theories from years past have proven inadequate (Ahmed 2006; Landani & Himayani 2020). Staphylococcus species along with other bacteria create biofilms in chronic lacrimal infections which makes them resistant both to immune defense mechanisms and to systemic antibiotic treatments (Schaefer & Schaefer, 2020; Barna et al., 2019). Clinical antibiotic treatment without microbiological diagnoses leads to a high chance of therapeutic failure and worsens antimicrobial resistance at a global scale specifically in ophthalmology (Scaglione et al., 2022; Harris et al., 2020). The use of ampicillin-sulbactam proved effective based on sensitivity testing so physicians need to rely on culture-guided procedures when treating antibiotic-resistant infections even in empiric treatment areas.

Blood tests demonstrated elevated C-reactive protein together with leukocytosis and accelerated erythrocyte sedimentation rate that create the systemic inflammatory activation pattern. Lab results from chronic dacryocystitis show clear signs that the condition has systemic inflammatory effects to the body during acute flare-ups (Pinar-Sueiro et al., 2012; Kashkouli et al., 2012). Medical practitioners should now recognize that inadequate treatment of chronic lacrimal infections allows them to act as systemic infection foci as recent medical knowledge aligns with this perspective (Diaz et al., 2008; Meng et al., 2023; Salmon, 2024).

Patient recovery with systemic antibiotics and corticosteroids validates that therapeutic medical stabilization stands as a biological necessity beyond being an optional procedure. Preoperative medical treatment reduces pain scores while decreasing discharge and lesion size since it manages both symptomatic and pathophysiological inflammatory mechanisms in a way that optimizes surgical conditions and might lead to superior postoperative recovery (Steele, 2016; Meng et al., 2023; Helander et al., 2019; Feldheiser et al., 2016; Smith et al., 2018). The staged treatment method draws from inflammatory management principles that show improving the treatment environment before invasive procedures leads to decreased medical complications (Schaefer & Schaefer, 2020; Harris et al., 2020; Javed et al., 2023).

Surgical Strategy and Outcome Expectations

The decision to perform external dacryocystorhinostomy (DCR) using silicone tube intubation received support from clinical, anatomical and microbiological research findings. Evidence shows External DCR delivers the best results for treating complex dacryocystitis conditions characterized by extensive fibrosis and traumatic anomalies when nasal structure integrity is disrupted because it attains success levels better than 90% in modern study findings (Abbasoglu et al., 1996; Steele, 2016; Soebagjo, 2020). Endonasal rhinological procedures fail to provide safe treatment when severe septal deviance and substantial sac fibrosis limit visual access as well as osteotomy dimensions (Barna et al., 2019; Tschopp et al., 2014). The external approach became the best choice for this patient since it provided the most rational solution for achieving the optimal surgical results.

Medical success during surgery heavily depends on the utilization of silicone tube intubation systems. Using silicone tubing to stent the newly created ostium becomes essential in extensive fibrosis healing because it supports patency during critical wound healing stages (Steele, 2016; Abbasoglu et al., 1996; Schaefer, 2015). A stenting procedure must occur in such cases because stent absence leads to restenosis and subjects patients to prolonged morbidity. The combination

of mucosal inflammation and concurrent findings of mastoiditis and systemic inflammation markers justifies long-term anatomical bypass creation through the external approach because this method better withstands these conditions than minimal access techniques (Meng et al., 2023; Li et al., 2022).

Lacrimal function restoration impacts patients psychologically just as much as it does anatomically which needs heightened recognition. The combination of persistent eye tearing with recurrent drainage and swollen tissue structures badly damages quality of life mainly affecting working performance together with social connection and emotional health in young adults (Meng et al., 2023; Dolar-Szczasny et al., 2023). The results of past quality-of-life research demonstrate that fitting DCR helps patients recover from physical symptoms alongside substantial improvements in self-esteem and social confidence thus highlighting lacrimal surgery as a restorative procedure that delivers functional outcomes (Pinar-Sueiro et al., 2012; Harris et al., 2020).

This case provides meaningful implications which affect clinical care at various practice levels. The situation shows the absolute requirement of quick medical action following ocular burns together with ophthalmologic evaluation in every facial burn case (Sweeney et al., 2020; Landani & Himayani, 2020). The second essential lesson concerns using complete diagnostic assessments which incorporate microbiological culture tests along with advanced imaging modalities for directing evidence-based therapy (Barna et al., 2019; Kashkouli et al., 2012; Abazaga & Fechtner, 2024). The condition calls for renewed medical attention towards chronic dacryocystitis because this condition represents a serious systemic disease that demands advanced interdisciplinary care (Rodrigues et al., 2022; Diaz et al., 2008).

Future research needs to study surgical results in trauma-induced fibrosis patients through extended prospective research while exploring pharmaceutical options like localized anti-fibrotic treatments for enhancing procedural survivability (Li et al., 2022; Qian et al., 2023). Research on the microbiome changes occurring in chronically obstructed lacrimal systems has the potential to create specialized therapeutic approaches that improve on traditionally used broad-spectrum antibiotics (Harris et al., 2020; Scaglione et al., 2022).

Conclusion

The patient with untreated childhood thermal trauma demonstrates vital knowledge about dacryocystitis development while showcasing proper therapy options and wider consequences of lacrimal problems. The history reveals how minimal early ophthalmic injuries set off tissue remodeling and subsequent fibrosis combined with persistent inflammation which ultimately triggered complex functional and anatomical disability after a lengthy duration. Thermal trauma proves to be a serious matter by creating prolonged eye damage that worsens when inflammatory processes remain untreated (Schaefer, 2015; Li et al., 2022; Soebagjo, 2020).

A complete diagnostic process developed by combining observations of clinical signs with fluorescein dye testing and contrast-enhanced CT imaging allowed an accurate identification of disease stage. Radiological investigation with CT imaging eliminated any doubts about the combined nature of chronic dacryocystitis because it showed microbiologic infection from Staphylococcus aureus alongside tissue fibrosis (Ahmed, 2006; Harris et al., 2020; Landani & Himayani, 2020). The results advocate for treating chronic dacryocystitis through combined approaches which meet microbiological and systemic and anatomical standards especially in conditions that develop after trauma occurrences.

The use of medical interventions before surgery obtained essential benefits by reducing both acute symptoms and preparing surgical conditions by lowering tissue inflammation and microbial presence. The treatment process now supports contemporary evidence which confirms that systemic inflammation control should be treated before surgical intervention for drainage pathway repair (Meng et al., 2023; Steele, 2016). The promotion of pre-operative

medical optimization continues to expand its importance among specialists from ophthalmology since it directly determines surgical efficiency in chronic inflammatory conditions (Rodrigues et al., 2022; Kashkouli et al., 2012).

The combination of external dacryocystorhinostomy with silicone tube intubation stands as an optimal choice for managing dacryocystitis cases that are complex, fibrotic or trauma-induced based on both anatomical requirements and evidence-based clinical standards set by Abbasoglu et al. (1996), Barna et al. (2019) and Steele (2016). Endonasal procedures should be used for simpler cases but would fail to yield adequate results for the anatomically complex patient condition. Through successful surgical correction patients experience anatomical recanalization together with meaningful psychosocial rehabilitation which restores both eyes and life quality for young patients with severe chronic symptoms (Meng et al., 2023; Dolar-Szczasny et al., 2023). The clinical implications of this case extend broader messages which benefit research activities and medical practice. Clinical staff must exercise continuous surveillance for delayed lacrimal system complications after facial burn injuries because these patients need extended monitoring (Sweeney et al., 2020; Badhu et al., 2005). Chronic dacryocystitis establishes itself as a non-minor inflammatory disease which causes extensive inflammatory involvement inside the body and generates severe mental health conditions when medical care is delayed (Pinar-Sueiro et al., 2012; Harris et al., 2020). The requirement for complete diagnostic assessments which combine microbial cultures with high-resolution scans ensures optimal treatment selection above general guidelines (Qian et al., 2023; Scaglione et al., 2022).

Research should target thorough studies of persistent dacryocystitis developing after facial trauma to determine disease recurrence rates and patient life quality progression while assessing the value of local anti-fibrotic drugs (Li et al., 2022; Barna et al., 2019). Studies that investigate the alterations in the lacrimal microbiota during chronic disease stages have the potential to reveal distinct treatment targets that go beyond traditional antibiotic categories (Harris et al., 2020; Scaglione et al., 2022). Every incident of lacrimal system illness requires acknowledgment of their unconfined status outside of localized ocular issues. The complete understanding of diseases in the lacrimal system requires viewing them as interrelating biological processes among tissue structures and inflammation, infection, anatomy and patient experiences.. Managing chronic dacryocystitis, especially in its complex, post-traumatic forms, requires more than technical expertise; it demands a holistic, evidence-driven, and patient-centered approach that recognizes the profound biological and human dimensions of seemingly localized disease.

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