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A case report: acute dacryocystitis with extensive preseptal cellulitis

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ABSTRACT

Background: Preseptal cellulitis is tissue inflammation localized to the anterior orbital septum. Preseptal cellulitis can spread widely from adjacent structures, the nose as a site of origin, antimicrobial defenses, and infection.

Case Presentation: We report clinical characteristics and management of a rare case of extensive preseptal cellulitis as dacryocystitis complications. A man was admitted with swelling and redness face. The swelling felt was getting bigger until it looked symmetrical on both sides of the face, and it was getting more painful, with pus, but no complaints of blurred vision, glare, or watery eyes. This patient is treated with systemic antibiotic and require incision and drainage the pus.

Conclusion: Preseptal cellulitis is tissue inflammation localized anterior to the septum. This case shows a rapidly developing preseptal cellulitis extending from right to left, and prompt and precise definitive management can provide a good prognosis.

Keywords: Acute dacryocystitis; preseptal cellulitis; sensitive antibiotic.

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INTRODUCTION

Tear production due to nasolacrimal duct obstruction is a common eye problem. One of the difficulties of nasolacrimal duct obstruction is preseptal cellulitis. Diagnosis and treatment of this condition require a thorough understanding of the lacrimal system and the eye and nose relationship. There are three main routes for inoculation of pathogens in the periorbital tissue, namely, hematogenous: through blood vessels of the upper respiratory tract or middle ear infections; spreads from adjacent structures: the paranasal sinuses are the most common (particularly the ethmoids, because the nerves and blood vessels cross the lamina papyracea which divide the ethmoids sinus from the orbit), chalazion/hordeolum, dacryocystitis, dacryoadenitis, canaliculitis, impetigo, erysipelas, herpes simplex, and lesions shingles skin, endophthalmitis; and direct injection: after eyelid trauma and bites of infected insects. Drainage of the orbital veins, eyelids, and sinuses flows primarily to the superior and inferior orbital veins, which drain into the cavernous sinuses. Because these veins do not have valves, the infection can quickly spread to the

preseptal and postseptal spaces and lead to cavernous sinus thrombosis.¹

Dacryocystitis is an inflammation of the lacrimal sac that usually results from the nasolacrimal duct's obstruction and results in stagnation and tear reserves in the lacrimal sac. These can further be categorized into duration (acute versus chronic) and onset (congenital and acquired causes). Acute dacryocystitis is treated with systemic antibiotics before intervention for nasolacrimal duct obstruction. In the United States, dacryocystitis in children is most likely due to B hemolytic Streptococcus, Staphylococcus aureus, Haemophilus influenza, and Pneumococcus. In contrast, in adults, it is more likely to be Staphylococcus aureus, Staphylococcus epidermidis, Streptococcus pneumoniae, and Pseudomonas aeruginosa.^{2,3} Risk factors for dacryocystitis vary but are usually associated with nasolacrimal duct obstruction. Older age causes narrowing of the ducts, which slows down tear drainage. The lacrimal sac becomes inflamed, causing characteristic erythema and edema in the inferomedial part of the orbit. Possible complications include the formation of a lacrimal fistula to a lacrimal

sac abscess.¹ Therefore, we will report a case report of acute dacryocystitis with extensive preseptal cellulitis.

CASE REPORT

A 65 years old man complained of swelling on the face of the lower right and left eye near the side of the nose for three days. It was initially pouring and redness on the right side of the face one week ago, then extending to the left side. The swelling felt was getting bigger until it looked symmetrical on both sides of the face, and it was getting more painful, but the complaint of fever was denied. Swelling and pain felt continuous-no complaints of blurred vision, glare, or watery eyes.

Pus was present, bleeding at the swelling site, the decreased vision, red eyes, cough, cold, sinusitis history and allergy history were denied. There was no history of applying for traditional medicine. The history of washing the eyes with betel water or other fluids was refuted. The patient has not been able to seek treatment. The patient had a history of trauma two years ago, maxillary fracture but did not require unique therapy for maxillary fractures.

On initial examination, visual acuity



Figure 1. Extensive preseptal cellulitis (Courtesy by Lestari).



Figure 2. Clinical presentation after two weeks review (Courtesy by Lestari).

of the right and left eye were obtained 6/6, area of the right inferior lacrimal canaliculus was edema (+), mass 2cm x 2cm in size, hyperemia (+), tenderness (+), fixed (+), well-differentiated, fistula (+), regular ocular movements, normal conjunctiva, absence of proptosis, and pupil with normal reaction to light. On head CT Scan examination, there is soft tissue swelling on the right facial. Maxillofacial bone and base crania showed no abnormalities, no fractures were seen. This patient was given inpatient care for antibiotic systemic (Anbacim and Metronidazole) and required incision and drainage of the pus.

After incision and drainage were conducted (Figure 1), the organs that

channel tears to the nasal cavity were the inferior punctum, the lacrimal canaliculus, the lacrimal sac, and the nasolacrimal duct at the right and left side left were edema (+), 5cm x 4cm in size, hyperemia (+), tenderness (+), undifferentiated shown. The anterior and posterior segments' examination was within normal limits, with a negative anel test result.

The patient was examined for microbiological culture and a sensitivity test for wound base pus. The culture results obtained Coccus gram-positive 2+, isolated *Staphylococcus coagulase-negative*, and vancomycin sensitivity test can be considered therapy.

In a review that occurs two weeks after antibiotic treatment (Figure 2) give a good

result. The patients' visual acuity of the right and left eye was obtained 6/6, area of the right inferior lacrimal canaliculus was no pain, no hyperemia, no edema, no fistula, with regular ocular movements, normal conjunctiva, absence of proptosis, and pupil with normal reaction to light.

DISCUSSION

The patient complains of facial swelling and redness. The node felt was getting bigger until it looked symmetrical on both sides of the face, and it was getting more painful, but the complaint of fever was denied. Swelling and pain felt continuous-no complaints of blurred vision, glare, or watery eyes. The classic sign of cellulitis preseptal patients is edema, redness/erythema, warm in the area of the lacrimal gland. Eyelid edema and erythema, normal visual acuity, absence of proptosis, pupils with normal reactions to light, normal conjunctiva, and regular ocular movements are the signs that help us to diagnosis cellulitis preseptal.⁴

In this case, the possible cause of extensive preseptal cellulitis was spread from adjacent structures, acute dacryocystitis. Early in the disease stage, it appears that the periductal tissue swells with dense subepithelial infiltration of lymphoblastic cells, thereby pressing on the lumen of the tear ducts.⁵ The epithelial tissue is still intact. Pathological changes are classified into mild, moderate, severe. Mild pathological changes characterized by inflammation or fibrosis limited to the upper third of the subepithelial mucosa, moderate inflammatory pathological changes or fibrosis confined to the upper part of the mucosa, and severe pathological changes in the form of inflammation or fibrosis involving the entire thickness of the mucosa.^{6,7} Fifty-eight percent of 36 samples (21/36) showed severe pathological changes, 28% (10/36) moderate pathological changes, and only 14% (5/36) showed mild pathological changes.⁵ Mild pathological changes also suggest hypersecretion by goblet cells and seromucous glands. In addition to the inflammatory infiltrate, the moderate pathologic change group also showed variable loss of differentiated epithelial cells, increased subepithelial fibroblasts,

shiny epithelial focal areas, and basal layer hyperplasia. Transmission electron microscopy at an early stage shows soft edema in epithelial cells with bacterial infiltration in all organelles. However, the epithelial layer is still intact.⁵

The lacrimal drainage system is colonized by many commensal bacteria and potentially pathogenic microorganisms. Defense in the lacrimal drainage system is necessary because of the mucosal tissue of lymphoid and antimicrobial peptides. One of the first events in the pathogenesis is inflammation of the lacrimal mucosa. This swelling causes stasis, which triggers organisms, infection, and subsequent scar tissue to form.⁶ A disorder that descends from the conjunctiva or ascends from the nasal cavity is a conceptual ascending and descending factor of infection. It usually begins with eye surface infection or conjunctivitis, causing nasolacrimal duct obstruction.⁶

The place of origin of the disease is the nose. Anatomical relationship between the lacrimal drainage system, nose, and paranasal sinuses. The nasolacrimal duct lies within the medial wall of the maxillary sinus the soft tissue of the nasolacrimal duct opens into the inferior meatus of the nose. Infection and inflammation in the nasal cavity and sinuses affect the nasolacrimal system for secondary involvement due to the close anatomical relationship and provide a potent force for the theory of upward inflammation in the case of extensive cellulitis.⁸ Therefore, it can be said that the nose is the place of origin of the disease. Most of the studies showed a positive correlation between the increased frequency of nasal disorders in extensive cellulitis cases compared to controls. Sinusitis problems do not appear to be directly related to nasolacrimal duct obstruction. Nasal and paranasal abnormalities can be associated with comorbidities without a direct influence

on the etiopathogenesis of nasolacrimal duct obstruction.⁶ However, other investigations are needed. A CT scan has been performed to rule out a differential diagnosis of facial swelling due to a tumor mass.

Intravenous antibiotic therapy is indicated for these patients. Broad-spectrum antibiotics are prescribed because they include gram-positive and gram-negative bacteria as empiric antibiotic therapy.^{6,8} In this case, antibiotics must also cover the anaerobic organisms; therefore, the patient is given Metronidazole due to incision and drainage of pus.⁹ Third-generation cephalosporins (Ceftriaxone, cefotaxime, ceftazidime), these drugs are less sensitive to β -lactamase-producing bacteria such as *S. aureus*. The patient is also cultured with a pus wound to prescribe the most appropriate antibiotic according to the bacteria's sensitivity.

CONCLUSION

Extensive preseptal cellulitis results from acute dacryocystitis that spreads to other soft tissues. The disease stages, starting from inflammation, an abscess, to fistula formation, indicate incisions and drainages. Definitive management was given after examining the antibiotic sensitivity of the wound pus culture.

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CONFLICT OF INTEREST

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AUTHOR CONTRIBUTION

The authors are equally contributed to the study since the conceptual framework until reporting the results.

REFERENCES

1. S, Öcal Demir; Çağan E, Kepenekli Kadayıfci E, Karaaslan A, Atıcı S AG& S. Clinical features and outcome of preseptal and orbital cellulitis in hospitalized children: Four years experience. *Medeni Med Journal*. 2017;32(1):7-13.
2. Az-zahra NF, Himayani R. Laporan Kasus : Anak Perempuan Usia 12 Tahun dengan Selulitis Preseptal Case Report : A 12 years Old Young Girl with Preseptal Cellulitis. 2020;9(4):625-630.
3. Paulsen MJAF. Etiopathogenesis of Primary Acquired Nasolacrimal Duct Obstruction: What We Know and What We Need to Know. *Ophthalmic Plast Reconstr Surg* . 2019;35(5). <https://pubmed.ncbi.nlm.nih.gov/30730434/>
4. American Academy of Ophthalmology. Preseptal cellulitis. Published 2021. Accessed December 27, 2020. <https://www.aao.org/image/preseptal-cellulitis-4>
5. Shoaie SD, Tehrani S, Arab-Mazar Z. Frequency of Preseptal Cellulitis and Its Risk Factors in Patients Admitted to Two Educational Hospitals in Tehran, Iran, During 2014 - 2015. *Int J Infect*. 2016;4(2):6-9. doi:10.5812/iji.42112
6. Stead TG, Retana A, Houck J, Sleigh BC, Ganti L. Preseptal and Postseptal Orbital Cellulitis of Odontogenic Origin. *Cureus*. 2019;11(7). doi:10.7759/cureus.5087
7. Savaş Şen Z, Tural Kara T, Keskin S, Özen G, Örnek F, Alioğlu B. Preseptal and Orbital Cellulitis in Childhood: The Experience of Ankara Training and Research Hospital. *J Pediatr Res*. 2019;6(1):64-69. doi:10.4274/jpr.galenos.2018.59144
8. Cantor LB, Rapuano CJ, Cioff GA. Orbit, Eyelids, and Lacrimal System. *Basic Clin Sci course*. Published online 2018:1-307.
9. Jack Kanski; Brad Bowling. *Kanski's Clinical Ophthalmology*. 8th ed. Saunders Ltd.; 2015.



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