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Case Report

Lacrimal Gland Abscess: A Case Report

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Keywords
Lacrimal gland abscess · Case report · Diffusion-weighted image · Apparent diffusion coefficient map · Drainage

Abstract
Introduction: The aim of the study was to report a rare case of lacrimal gland abscess. ***Case Presentation:*** A 47-year-old woman noticed upper eyelid swelling on the right side 1.5 months before referral to our service. Oral antibiotics were administered, based on the diagnosis of acute dacryoadenitis at another clinic. The symptom had once subsided 20 days later but recurred. On the first examination, the right upper eyelid was swollen with tenderness. The right lacrimal gland was palpable. Blood tests revealed positive proteinase 3-anti-neutrophil cytoplasmic antibody. T2-weighted magnetic resonance and diffusion-weighted images showed a high signal intensity lesion in an enlarged right lacrimal gland, while apparent diffusion coefficient map demonstrated the lesion with a low signal intensity. We started administration of intravenous antibiotics. Abscess drainage and lacrimal gland biopsy were performed 4 days after the first examination. Culture test of the abscess showed only 1 colony growth of *Cutibacterium acnes*. The specimen harvested from the lacrimal gland showed proliferation of fibrous connective tissue and infiltration of inflammatory cells without vasculitis. After the drainage, the swelling gradually subsided. Administration of antibiotics discontinued at 22 days of follow-up. At 4-month follow-up, the patient did not have any symptom related to the lacrimal gland abscess. ***Conclusion:*** The diffusion-weighted images and apparent diffusion coefficient map are helpful for the diagnosis of lacrimal gland abscess when the culture tests provide poor results.

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Introduction

Dacryoadenitis refers to a relatively rare inflammatory entity of the lacrimal gland [1]. It is caused by idiopathic, autoimmune, and infectious diseases [1]. Infectious dacryoadenitis is a rare entity, and common infectious etiologies are viruses, such as Epstein Barr, mumps, herpes simplex, and herpes zoster viruses [1]. In contrast, the bacterial pathogens are much rarer [1, 2], and further abscess formation in the lacrimal gland is extremely rare. Here, we report a case of acute dacryoadenitis with a lacrimal gland abscess. The CARE Checklist has been completed by the authors for this case report, attached as supplementary material (for all online suppl. material, see https://doi.org/10.1159/000535130).

Case Report

A 47-year-old woman noticed upper eyelid swelling on the right side 1.5 months before referral to our service. An ophthalmologist diagnosed it as allergic conjunctivitis and prescribed an anti-allergic eyedrop. However, the eyelid swelling was gradually worsened in a month. She consulted with a neurosurgeon who diagnosed it as acute dacryoadenitis, based on findings of magnetic resonance imaging (MRI). The symptom had once subsided after taking oral antibiotics for 20 days but recurred. She had no prior history of any immunodeficient or autoimmune disease, or viral infection. She also had no history of preceding fever.

On the first examination, the best-corrected visual acuity was 1.0 and intraocular pressure was 15 mm Hg in the right eye and 14 mm Hg in the left eye. The right upper eyelid was mildly swollen (Fig. 1a). The right lacrimal gland was palpable, and tenderness was present. The right upper eyelid was mechanically ptotic, and margin reflex distance-1 was 2.0 mm on the right side and 3.5 mm on the left side. Hertel exophthalmometer values were 13 mm in the right eye and 12 mm in the left eye (base, 99 mm). Hess chart showed mild limitation of supraduction in the right eye. Slit-lamp examination revealed bulbar conjunctival injection in the temporal region of the right eye. Funduscopic examination revealed retinal folds in the right eye. Blood test demonstrated increased C-reactive protein (0.42 mg/dL; normal range, ≤0.14 mg/dL), although white blood cell was within normal range (7,100/μL; normal rage, 3,100-8,400/μL). Soluble interleukin-2 receptor and β2 microglobulin levels were within normal range. Immunoglobulin M of Epstein Barr and mumps was negative. Blood test for autoantibodies revealed increased rheumatoid factor (23.9 mg/dL; normal range, ≤15 mg/dL) and proteinase 3-anti-neutrophil cytoplasmic antibody (PR3-ANCA) (7.0 IU/mL; normal range, ≤2.0 IU/mL). T2-weighted MRI showed an oval-shaped, high signal intensity area in an enlarged right lacrimal gland (Fig. 1b). Diffusion-weighted imaging (DWI) also showed a high signal intensity lesion in the right lacrimal gland (Fig. 1c), and apparent diffusion coefficient (ADC) map demonstrated the lesion with a low signal intensity (Fig. 1d). These findings corresponded to the diagnosis of a lacrimal gland abscess. Systemic work-up did not reveal any suspicious lesion of adjacent (rhinosinusitis) or distant septic foci. Swab culture test of the upper fornix near the right lacrimal gland was negative.

The patient was admitted to our hospital. We consulted with the infection control team and administered 2 g of intravenous ceftriaxone sodium hydrate and 1.8 g of intravenous clindamycin per day to the patient. During hospitalization, we consulted with a specialist of connective tissue disorders and ENT surgeon, but there was no suspicious lesion of granulomatosis with polyangiitis. Drainage of the abscess and biopsy of the lacrimal gland were performed 4 days after the first examination. The drained fluid was turbid in color. Direct

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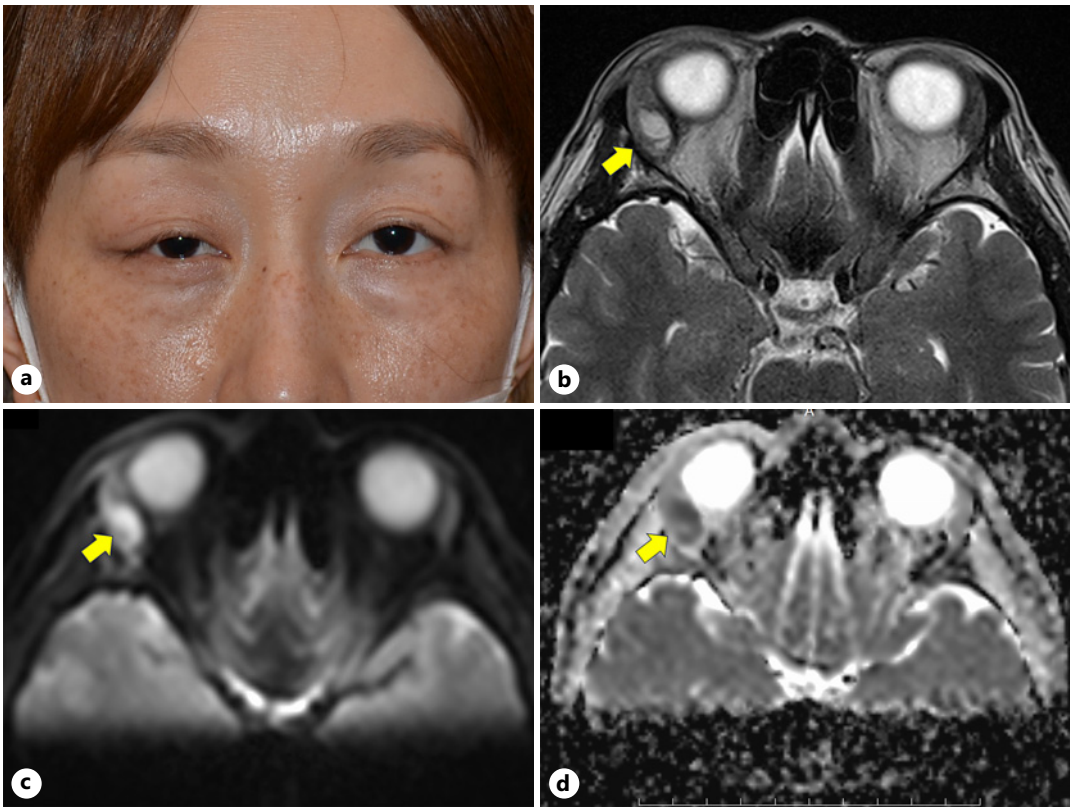

Fig. 1. Images of the case. **a** Patient face photo taken on the first examination showing eyelid swelling on the right side. **b**–**d** Magnetic resonance images (MRIs). **b**, **c** Axial T2-weighted MRI (**b**) and diffusion-weighted image (**c**) showing high signal intensity lesions in the right lacrimal gland (arrows). **d** ADC map showing a lacrimal gland lesion with a low signal intensity (arrow).

smear examination showed only red blood cells. Culture test of the abscess revealed only 1 colony growth of *Cutibacterium acnes*. The specimen harvested from the lacrimal gland showed proliferation of fibrous connective tissue and infiltration of inflammatory cells. However, vasculitis was not found.

After the drainage, the swelling gradually subsided. At 12-day follow-up, intravenous clindamycin was discontinued. At 15-day follow-up, the patient was discharged. Antibiotic was changed from intravenous ceftriaxone to oral clavulanate potassium and amoxicillin trihydrate, which was discontinued at 22-day follow-up. At 4-month follow-up, the patient did not have any symptom related to dacryoadenitis.

Discussion

We report a case with a lacrimal gland abscess, which is a rare condition of acute suppurative bacterial dacryoadenitis. Common organisms of bacterial dacryoadenitis include Staphylococci, Haemophilus, Streptococci, Pseudomonas, Klebsiella, and skin flora [1]. In this case, swab test of the upper fornix was negative, and culture test of the abscess showed only 1 colony growth of *C. acnes*. Although *C. acnes* belongs to category of skin flora and can be the causative organism of abscess formation in this case, this positive result may be due to contamination of the bacteria. Long-term administration of oral antibiotics may lead to those results of the culture tests.

Lacrimal gland abscesses were depicted on computed tomographic images in most of the previous studies [1–5]. However, computed tomographic image is less informative for the diagnosis of lacrimal gland abscess as compared to MRI. There had been few studies showing MRI in patients with a lacrimal gland abscess [6–8], and none of the previous reports showed DWI and ADC map, which are more useful for the differentiation of an abscess from other cystic lesions [9]. Although we obtained poor results of culture tests, we could diagnose the patient as a case of lacrimal gland abscess, based on the MRI findings.

The necessity of surgical drainage for lacrimal gland abscesses is controversial. Although incision and drainage were performed in all patients in previous studies [3, 5], another previous study demonstrated that 6 of 12 patients with a lacrimal gland abscess experienced spontaneous drainage or did not require surgical drainage [1]. In this case, combined surgical drainage with lacrimal gland biopsy was performed because of persistent periorbital inflammation and positive PR3-ANCA. However, poor growth of pathogenic bacteria in the culture test for the lacrimal gland abscess, as well as mild periorbital inflammation shown on the first visit, implies the efficacy of systemic antibiotics and no requirement of surgical drainage in this case.

In conclusion, we report a rare case of a lacrimal gland abscess. The DWI and ADC map of MRI are helpful for the diagnosis of lacrimal gland abscess when the culture tests provide poor results.

Statement of Ethics

This study protocol was reviewed and the need for approval was waived by the Institutional Review Board of Aichi Medical University Hospital. Written informed consent was obtained from the patient for publication of the details of their medical case and any accompanying images. This study was conducted in accordance with the tenets of the Declaration of Helsinki and its later amendments.

Conflict of Interest Statement

The authors have no relevant financial or non-financial interests to disclose.

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Author Contributions

All authors qualify for authorship based on contributions to the conception and design and literature search (Y.T.), acquisition of data (M.I. and Y.T.), and analyses and interpretation of data (M.I., A.V., S.K.S., and Y.T.). All authors contributed to drafting the article and revising it critically for important intellectual content and final approval of the version to be published. No one contributed to the work who did not meet our authorship criteria.

Data Availability Statement

All data generated or analyzed during this study are included in this article. Further inquiries can be directed to the corresponding author.

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