



## Case report

## A case with acquired lacrimal fistula due to Sjögren's syndrome

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## ABSTRACT

**Purpose:** To report a case with lacrimal fistula presumably associated with Sjögren's syndrome.**Observations:** A patient with Sjögren's syndrome was referred to our hospital for fistula from the inferior lacrimal canaliculus to the palpebral conjunctiva of her left lower eyelid. She also revealed severe dry eye in both eyes. She had no history of trauma or congenital lacrimal fistula. She was administering 0.3% purified sodium hyaluronate and 3% diquafosol sodium solution 6 times a day for dry eye. The Schirmer-1 test indicated that tear secretion was 0 mm for 5 min for both eyes. She was diagnosed with Sjögren's syndrome based on increased levels of blood Sjögren's-syndrome-related antigen A and Sjögren's-syndrome-related antigen B antibodies, decreased saliva volume, and lip biopsy. We performed silicone tube intubation and patched the fistula with conjunctiva. We observed the lacrimal sac and nasolacrimal duct under lacrimal micro-endoscopy; there was no bacterial concretion, obstruction, and inflammation of lacrimal mucosa. After the operation, her symptoms improved and lacrimal perforation healed after the removal of the silicone tube.**Conclusions and importance:** Sjögren's syndrome can cause not only corneal perforation but also mucosal perforation, which may lead to a lacrimal fistula. Sjögren's syndrome patients with severe dry eye should be managed carefully.

## 1. Introduction

Sjögren's syndrome is characterized by autoimmune inflammation and destruction of the lacrimal and salivary glands. This condition is classified as primary when it exists in isolation, and secondary when associated with other diseases such as rheumatoid arthritis, SLE, systemic sclerosis, mixed connective tissue disease, primary biliary cirrhosis, chronic active hepatitis, and myasthenia gravis.

In the United States, for the diagnosis of Sjögren's syndrome, the case definition requires at least 2 out of the following 3 criteria: (1) positive serum anti-Sjögren's-syndrome-related antigen A (SSA) and/or anti-Sjögren's-syndrome-related antigen B (SSB) antibodies, or positive rheumatoid factor and antinuclear antibody (ANA)  $\geq 1:320$ ; (2) ocular staining score  $\geq 3$ ; (3) presence of focal lymphocytic sialadenitis with focus score  $\geq 1$  focus/4 mm<sup>2</sup> in labial salivary gland biopsies.<sup>1</sup> In Japan, the case definition requires at least 2 out of the following 4 criteria: (1) presence of focal lymphocytic sialadenitis with focus score  $\geq 1$  focus/4 mm<sup>2</sup> or the number of cells in the periductal lymphoid cell infiltration over 50, which can be regarded as a focus; (2) oral examination findings such as A) small punctuate shadows less than 1 mm in diameter on sialography or B) decreased salivary secretion on sialometry and salivary scintigraphy including chewing gum test (10 ml

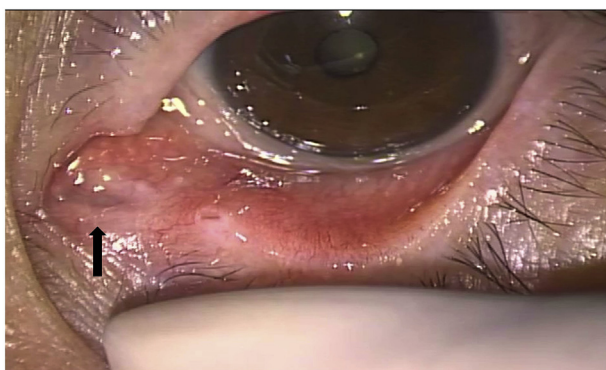
per 10 min or less) or Saxon test (2 g per 2 min or less); (3) ocular examination findings such as A) a combination of Schirmer test  $\leq 5$  mm and the rose bengal test  $\geq 3$ , and B) a combination of Schirmer test  $\leq 5$  mm and fluorescein staining test  $\geq 3$ ; (4) either positive anti-Ro/SSA antibody or positive anti-La/SSB antibody on serologic tests.<sup>2</sup> Although rare, peripheral superficial corneal neovascularization and epithelial breakdown, melting, and perforation of the cornea may develop in very severe cases.<sup>3</sup>

Lacrimal fistulas are classified into congenital and acquired. Acquired fistula occurs due to trauma (laceration), operations, or infection.<sup>4,5</sup> In congenital fistula, the treatment includes simple excision, excision and dacryocystorhinostomy, or intubation. In acquired fistula, the canalicular laceration is repaired using either monocalicular or bicanalicular stents.<sup>5</sup>

It was reported that Sjögren's syndrome could be associated with pulmonary arteriovenous fistula<sup>6</sup> and vaginoperineal fistula after perianal surgery.<sup>7</sup> However, no case of Sjögren's syndrome associated with the development of lacrimal fistula has been reported to date. Here, we report a patient with Sjögren's syndrome who developed a lacrimal fistula.

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**Fig. 1.** Slit lamp photographs of the left eyelid and conjunctiva on the first day. (A) Fistula (arrows) observed at the nasal side of the inferior lacrimal punctum. The size of the fistula was about 4 mm.

## 2. Case report

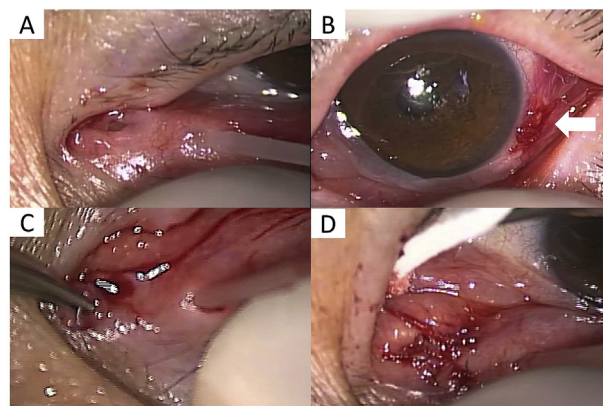
A 62-year-old woman was referred to our hospital due to inferior lacrimal canaliculus-palpebral conjunctival fistula of her left lower eyelid. She felt ocular foreign body sensation and increase of discharge. She was treated for severe dry eye and prescribed 0.3% purified sodium hyaluronate and 3% diquafosol sodium solution 6 times a day, at the referral hospital. She had no history of eyelid trauma, lacrimal disease, punctal plug insertion and congenital lacrimal fistula. Her best corrected visual acuity was 20/20 OD and OS. On slit lamp examination, we found a fistula about 4 mm at the nasal side of her left lower eyelid (Fig. 1). On fluorescein staining, her both conjunctival epithelial damage (9 spots) and corneal epithelial damage (5 spots) were revealed. The Schirmer-1 test indicated that tear secretion was 0 mm for 5 min for both eyes. When her left lacrimal pathway was washed with saline solution, the saline solution leaked out of the fistula and reached the nasal cavity; however, there was no discharge. Blood tests showed an increase in ANA about 160 times, SSA antibody > 500 U/ml, SSB antibody 136 U/ml. Nuclear medicine test with  $^{99m}\text{Tc}$  (technetium) revealed reduced accumulation in the parotid gland and submandibular gland. The Saxon test indicated that the salivary secretion was 1.39 g for 2 min. A lip biopsy was performed for the diagnosis, which revealed findings lymphocyte and plasma cell infiltration in the lobule and fibrosis. It was confirmed by medical doctor of internal medicine that there was no collagen disease and rheumatoid arthritis except of Sjögren's syndrome. We diagnosed primary Sjögren's syndrome based on these findings.

First, we treated the punctal occlusion with a punctal plug (Punctalplug F®, TOMEY, Aichi, Japan) insertion in her right eye and we stopped 0.3% purified sodium hyaluronate and 3% diquafosol sodium solution drops and prescribed 0.1% fluorometholone and artificial tears eye drops 4 times a day. Second, we performed filling of the fistula using a free flap of conjunctiva and silicone tube (LACRIFAST®, Kaneka, Osaka, Japan) intubation in her left eyelid (Fig. 2). We observed the lacrimal sac and nasolacrimal duct under lacrimal micro-endoscopy; the fistula led to the inferior lacrimal canaliculus, and there was no bacterial concretion, obstruction, and inflammation of the lacrimal mucosa (Fig. 3). There was no stenosis or scar around the fistula. After the operation, her symptoms were improved and the lacrimal perforation healed (Fig. 4). Two months after the operation the silicone tube was removed, and there was no recurrence of the lacrimal fistula.

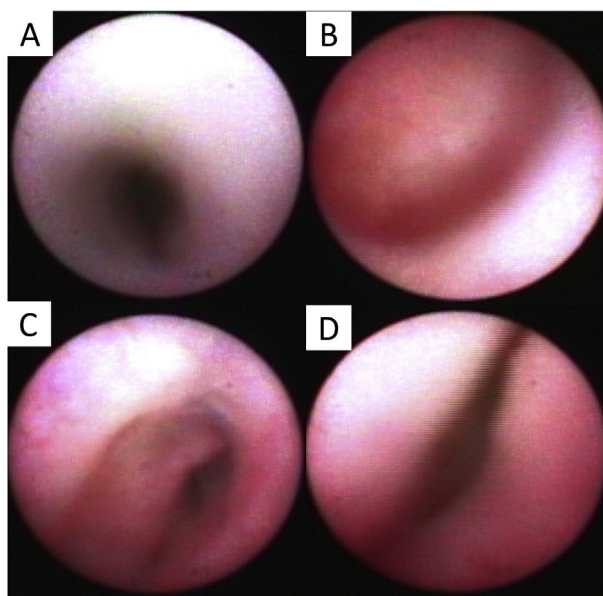
The patient provided written consent for publication of this report, including record details and photographs.

## 3. Discussion

Here, we reported a patient with Sjögren's syndrome, who developed conjunctival perforation and lacrimal fistula.

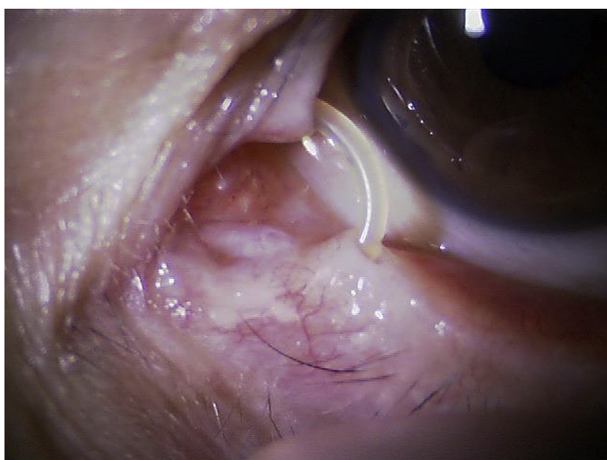


**Fig. 2.** Photographs during intubation and conjunctival patch surgery. (A) The fistula connecting the inferior lacrimal punctum and the lacrimal sac. (B) We created the conjunctival free flap from the inferior temporal conjunctiva (arrows). (C) We sutured the conjunctival free flap onto the lacrimal fistula using absorbing thread. (D) The fistula is covered by the conjunctival free flap.



**Fig. 3.** Photographs of the lacrimal endoscopy. There was no inflammation of the mucosa or lacrimal concretion in (A) the inferior lacrimal canaliculus, (B) the lacrimal sac, and (C, D) the nasolacrimal duct.

We considered 4 possibilities for the causes of conjunctival fistula. First, the conjunctival changes due to Sjögren's syndrome might have resulted in fistula formation. Sjögren's syndrome patients have reduced number of secretory vesicles and loss of ocular surface glycocalyx, which prevent abrasive influences on the epithelial cells.<sup>8</sup> The concentration of epithelial growth factor in tears is significantly decreased in patients with Sjögren's syndrome.<sup>9</sup> These changes in Sjögren's syndrome patients might lead to the environment where the conjunctival scar is difficult to heal. Second, eye drops might have influenced the conjunctival damage. Patients with Sjögren's syndrome should employ frequent use of preservative-free tear substitutes.<sup>10</sup> A patient who has dry eye due to a rheumatological condition is at an increased risk of corneal melt with the use of preservative-containing eye drops,<sup>11</sup> and corneal perforation occurs in Sjögren's syndrome patient following topical NSAID and steroid drops post cataract surgery.<sup>12</sup> In our case, 0.3% purified sodium hyaluronate and 3% diquafosol sodium solutions were administered, and both drops contained preservatives. There was a possibility of preservatives as a cause of perforation, and therefore, we stopped these drops and prescribed preservative-free artificial tears and



**Fig. 4.** Slit lamp photographs of the left eyelid after intubation and conjunctival patch surgery. Silicone tubes were intubated in both lacrimal pathways. The fistula in the lower eyelid was closed by the conjunctiva.

steroid drops for anti-inflammation. There was no report that 0.3% purified sodium hyaluronate and diquafosol sodium solutions caused lacrimal perforation. Third, lacrimal pathway infection might have resulted in lacrimal perforation. It was reported that corneal perforation might occur due to bacterial concretion derived from lacrimal canalculitis.<sup>13</sup> The corneal melting was due to enzymes released by *Actinomyces* with lacrimal canalculitis. This In case, we checked the lacrimal canaliculus, lacrimal sac, and nasolacrimal duct with lacrimal endoscopy and there was no inflammation of lacrimal mucosa nor bacterial concretion. However, the possibility of inflammation of the lacrimal mucosa that had occurred in the past cannot be denied. Fourth, the fistula might be accessory puncta. Accessory puncta was not confirmed her lower conjunctiva at the referral hospital but there could not deny the possibility that there was an accessory puncta. Case series of supernumerary lacrimal puncta and canaliculi was reported that adult accessory puncta might be associated lacrimal and systemic abnormalities, functional impairment of canalicular drainage and acquired nasolacrimal duct obstruction.<sup>14</sup> In this case, there was no symptom of epiphora and no findings in lacrimal pathway.

In this case, the size of lacrimal fistula was about 4 mm, and therefore, it was difficult to suture and close the fistula. The patient's request was to perform a complete repair of the lacrimal duct and therefore, we performed conjunctival patch and intubation based on the treatment of canalicular laceration in acquired fistula.<sup>5</sup> There was also a treatment option of punctal plug and suture of fistula for the low tear volume due to Sjögren's syndrome. In this case, since the patient demanded a complete repair of the lacrimal pathway, we performed conjunctival patch and intubation.

#### 4. Conclusions

Sjögren's syndrome can cause not only corneal perforation but also mucosal perforation. In the present case, the lacrimal perforation and fistula was presumably caused by Sjögren's syndrome. Therefore,

special care should be taken with respect to the management of dry eye and infection in patients with Sjögren's syndrome.

#### Patient consent

The patient's legal guardian provided consent for the publication of the case in writing.

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#### Conflicts of interest

All authors have no financial disclosures.

#### Authorship

All authors attest that they meet the current ICMJE criteria for Authorship.

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