

## CASE REPORT

# Salt Water Induced Blepharitis: A Lifestyle-Related Case from a Coast of Java

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**Abstract**

**Introduction:** Blepharitis is a disease that is often countered. This condition could occur in all ages, sexes, and ethnic groups. Several factors can be the cause of blepharitis. However, blepharitis cases caused by saltwater have never been reported. **Case Presentation:** There was a case of a 62-year-old woman who came to the hospital complaining of a foreign body sensation in both eyes. Through examination, it was found that the eyelashes looked dirty with brownish-yellow deposits. Management by doing eyelid hygiene, giving ofloxacin eye drops, NaCl / KCl eye drops, and hygiene education had been done. **Conclusions:** Blepharitis is a frequently encountered case. However, blepharitis caused by salt water has not been reported. Through this case, it could be learned that the patient's lifestyle and geographical location of the patient's residence must be of particular concern to the clinician.

**Keywords:** blepharitis; salt water; deposits; coastal area

**Introduction**

Blepharitis is an inflammatory condition that occurs in the eyelid margin. This condition can occur in all ethnicities, sexes, and age groups. Generally, blepharitis is more often found in individuals over 50 years old. The prevalence was also found to increase over time and higher in women.<sup>[1]</sup>

Blepharitis is a disease that is often countered. A survey in the United States<sup>[2]</sup> declared that up to 47% of patients examined by ophthalmologists have signs of blepharitis. A cohort study in South Korea<sup>[3]</sup> noted 1.116.363 cases diagnosed with blepharitis during 2004–2013, with an incidence rate of 1.1 per 100 person per year. However, the incidence and prevalence of blepharitis in Indonesia have not yet been documented well.

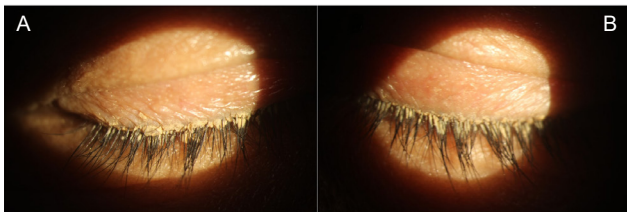
Several factors can be the cause of blepharitis; some examples of these factors are infection, allergy, irritation, and cosmetics on the eye (mascara).<sup>[4],[5]</sup> Still, blepharitis cases caused by salt water have not been reported.

**Case presentation**

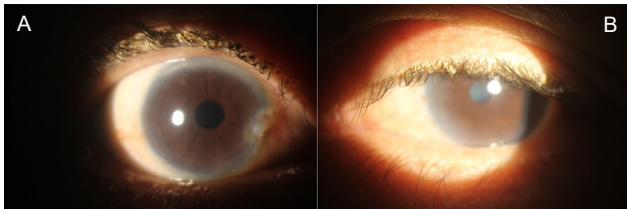
A 62-year-old woman came to the hospital with complaints of foreign body sensations in both eyes. The complaint had been felt for a week. This complaint also came with mild pain, watery pink eyes, and sticky discharge on both eyes. Complaints have been continuous for a week and did not improve. Other complaints like decreased vision, cosmetics usage history, and trauma history were denied.

From the anamnesis, it was found that the patient had a history of cataract surgery four months ago in the right eye. The patient also had a history of conjunctivitis in the past three months and had been given therapy with levofloxacin eye drops and prednisolone eye drops. There was no history of other diseases, such as allergies or diabetes mellitus.

The patient lives on the coast of Jatirejo Village, Lekok District, Pasuruan County, East Java. Based on family information, the patient lives in a house <



**Figure 1.** (A) Right eyelid (closed) showed brownish yellow deposits at the base of the eyelash and (B) Left eyelid (closed) also showed brownish yellow deposits.

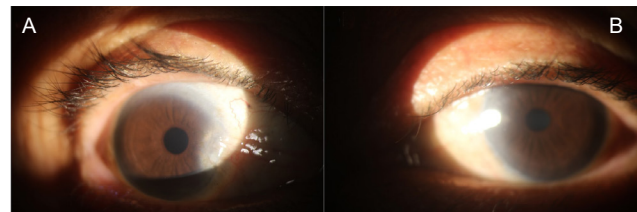


**Figure 2.** (A) Right eye anterior segment with diffuse illumination showed hyperemic conjunctiva, mucoid discharge, grade one pterygium, and attached IOL and (B) Left eye anterior segment with diffuse illumination showed hyperemic conjunctiva, mucoid discharge, and cloudy lens.

10 meters from the beach. This condition makes access to fresh water challenging because the wells produce salt water. In addition, no state tap water supply system by the government services are available, so patients had to use salt water from wells for daily activities such as washing their faces, washing their hands, and bathing. Fresh water can only be accessed by purchasing from an agent at IDR 3.000 per jerrycan—the lack of fresh water where the patient lives means that fresh water is only used for consumption. Difficulty in accessing fresh water is also experienced by the other residents living in the area. Therefore, salt water usage for daily activities becomes normal in this area. The patient's family stated that several neighbors also often experienced red eyes but did not go to the health service.

On examination, the patient's visual acuity was right eye (RE) 6/15 and left eye (LE) 6/24. No correction was performed in this case. From the examination that has been done using a slit lamp, the following results were obtained. Both eyelashes look dirty, foreign body is found in the base of the eyelash in the form of brownish-yellow deposits, madarosis (-), palpebra hyperemic (+), and edema (-) (Figure 1). Slit lamp examination also showed thick clear mucoid discharge (+), hyperemic conjunctiva, chemosis (-), clear cornea, arcus senilis (+), vascularization (-), regular round pupils, pupillary light reflex (+), RE intraocular lens (IOL) attached while LE lens appears cloudy (Figure 2). Under ideal conditions, the foreign body should be examined under the microscope to ensure crust formation. Unfortunately, a microscope for examining specimens is not yet available in the hospital due to a lack of service.

The patient was diagnosed with anterior blepharitis and a foreign body on the external eye. Then, treatment



**Figure 3.** (A) Right eye anterior segment with diffuse illumination showed no foreign body, non-hyperemic conjunctiva, grade one pterygium, and attached IOL (B) Left eye anterior segment with diffuse illumination showed no foreign body, non-hyperemic conjunctiva, and cloudy lens.

is given through eyelid hygiene using distilled water and sterile gauze, ofloxacin eye drops 6x RLE, and NaCl/KCl eye drops 6x RLE. Education is provided to change lifestyles using fresh water, especially for bathing or washing the face. Patients were advised to do the further evaluation and the subsequent treatment one week later.

### Follow up 1

The patient came back a week after the initial examination. Complaints have improved, foreign body sensation has decreased, sticky feeling has decreased, but sometimes the eyes still felt watery.

Based on the examination, the visual acuity was RE 6/15 and LE 6/30 without eyeglass correction. Slit lamp examination found both eyelashes and eyelid look clean, deposits (-), madarosis (-), hyperemic palpebra (-), edema (-), discharge (+), hyperemic conjunctiva, chemosis (-), clear cornea, arcus senilis (+), vascularization (-), regular round pupils, pupillary reflex (+), RE IOL attached to IOL, LE lens looks cloudy (Figure 3).

Subsequent therapy combining tobramycin/dexamethasone eye drops 6x RLE and vitamin A palmitate eye ointment 3x RLE. The patient was scheduled for subsequent evaluation one week later, but the patient did not come to the hospital.

### Discussion and conclusions

Based on the anatomical classification, blepharitis is divided into anterior and posterior blepharitis. Anterior blepharitis is characterized by inflammation of the base and follicles of the eyelashes. Meanwhile, posterior blepharitis is characterized by inflammation of the meibomian glands. According to the clinical classification, anterior blepharitis consists of staphylococcal (ulcerative) and seborrheic blepharitis. On the other hand, posterior blepharitis is clinically similar to meibomian gland dysfunction (MGD).<sup>[6]</sup>

To differentiate each type of blepharitis, a thorough examination is needed. In anterior blepharitis, the physician will find inflammation with either eyelid ulceration, an infectious cause (blepharitis anterior ulcerative), or greasy debris in seborrheic blepharitis. In posterior blepharitis, the physician will find follicular

or papillary reactions with mild hyperemic conjunctiva. However, this case presents blepharitis caused by exposure to a foreign body, suspected to have formed by salt water and marked by a brownish-yellow crust at the base of eyelashes and hyperemic palpebra. Although a microscope examination is not done, the hygiene factor found in anamnesis could support this suspected cause.

Several treatments are available for blepharitis. In this case, general treatment includes warm compresses, eyelid cleansing, and pharmacotherapy. A warm compress on the eyelids can soften sticky crusts or dandruff while warming the secretions from the meibomian glands. Warm compress can be done using a clean towel soaked in warm water.<sup>[7]</sup> Besides a warm compress, eyelid cleansing can also be helpful. In this case, eyelid cleansing using distilled water and sterile gauze was chosen to clean the foreign body from the eyelid. In other studies, it was stated that the choice of cleaners varied greatly. Starting from products commonly used in households, products made from tea tree oil, baby shampoo, or cleaning products made from organic ingredients.<sup>[8]</sup>

Pharmacotherapy also shows good improvement in blepharitis. Antibiotics, corticosteroids, antibiotics-corticosteroid combinations, and calcineurin inhibitors can be given in this case. In antibiotics, research states that using an azithromycin solution of 1% as a treatment for anterior and posterior blepharitis can treat the symptoms of anterior and posterior blepharitis. Other classes of antibiotics, like fluoroquinolones, can also be used. Levofloxacin 0.5% four times a day for seven days can reduce the number of bacteria in patients with blepharoconjunctivitis in culture examinations.<sup>[9]</sup> Aminoglycosides class like tobramycin is considered to have the same effectiveness and safety as azithromycin.<sup>[10]</sup>

Topical corticosteroids are only used in blepharitis with severe inflammatory symptoms. Once the inflammation has reduced, its use can be stopped, and it can be used again intermittently. Side effects can be reduced using site-selective corticosteroids such as loteprednol etabonate and low-penetration steroids in the eye such as fluorometholone. Other research<sup>[11]</sup> also shows that a combination of dexamethasone 0.1%/tobramycin 0.3% and loteprednol etabonate 0.5%/tobramycin 0.3% gives the same results for cases of eye inflammation. However, using dexamethasone can cause an increase in intraocular pressure.<sup>[11]</sup> A case report<sup>[12]</sup> also shows that calcineurin inhibitors such as topical cyclosporine 0.5% can provide promising results in treating blepharitis. This treatment is said to be superior to corticosteroids because it does not suppress the host's immune response and does not increase the production of collagenolytic enzymes that cause corneal thinning.

In this case, blepharitis is thought to be caused by salt water, which settles to form salt crystals on the palpebral

margin. Cases of blepharitis due to salt water have not been reported; however, several other studies on dermatitis state that irritants composed of marine biota toxins or metals in seawater can cause irritant contact dermatitis.<sup>[13],[14]</sup> Therefore, lifestyle changes are needed, especially changing the habit of using water for bathing or washing the facial area in this case.

Another study on saltwater states that the phenomenon of wells producing salt water is called seawater intrusion. Seawater intrusion is common in coastal areas and is believed to carry heavy metal pollutants. Contamination can be caused by elements of copper, mercury, cadmium, or lead, causing various health risks, including blepharitis.<sup>[15]</sup>

Blepharitis is a frequently encountered case. It has been known that infection and sebum gland dysfunction is the common cause of this disease; however, this case presents blepharitis caused by salt water that has not been reported yet. Hygiene, lifestyle, and where the patient lives play a role in this unique case. General treatment in blepharitis, such as eyelid hygiene and antibiotics, such as steroid pharmacotherapy, shows good improvement, combined with lifestyle education.

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