



## **Serratia marcescens Lacrimal Canaliculitis**

**Temitope Ewete<sup>1\*</sup> and Adegboyega Sunday Alabi<sup>1</sup>**

<sup>1</sup>MeCure Eye Centre, Lagos, Nigeria.

### **Authors' contributions**

This work was carried out in collaboration between both authors. Author TE wrote the case report, did some of the literature search, first draft of the manuscript and supervised the microbiological studies. Author ASA did literature search and edited the manuscript. Both authors read and approved the final manuscript.

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**Case Report**

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### **ABSTRACT**

**Introduction:** *Serratia marcescens* is a motile, facultatively anaerobic gram-negative rod of the Enterobacteriaceae family and has been implicated mostly in contact lens related keratitis. We report a case of lacrimal duct canaliculitis seen in an elderly patient with no known risk factors for *Serratia marcescens* infection.

**Presentation of Case:** 74-year-old woman presented with loss of vision in the left eye and decreased vision, purulent discharge, swelling and itching of the right eye. Examination revealed nasal upper and lower lid swelling of the left eye with copious foul smelling, purulent discharge with yellowish concretions. On the basis of these findings, an assessment of lacrimal gland canaliculitis was made and a sample of the discharge sent for microbiology, culture and sensitivity revealed *Serratia marcescens* as the causative organism. The patient was placed on topical and oral antibiotics and response was good.

**Conclusion:** This case reveals that *Serratia marcescens*, although a rare cause of ocular infections, cannot be ruled out as a cause of lacrimal canaliculitis in patients with no known risk factor. This reinforces the fact that microbiology, culture and sensitivity should be done in all cases of lacrimal gland infections.

**Keywords:** *Serratia marcescens*; lacrimal canaliculitis.

\*Corresponding author: E-mail: [temidemi2000@gmail.com](mailto:temidemi2000@gmail.com);

## 1. INTRODUCTION

*Serratia marcescens* is a species of rod-shaped gram-negative bacteria in the family Enterobacteriaceae. A human pathogen, *S. marcescens* is involved in hospital-acquired infections (HAIs), particularly catheter-associated bacteraemia, urinary tract infections and wound infections [1]. *Serratia marcescens* has also been identified as the causative agent in lacrimal duct infections, conjunctivitis, keratitis, and endophthalmitis [2]. Frequently, the infection has been associated with systemic risk factors such as diabetes mellitus, renal failure, alcoholism, and rheumatoid arthritis.

*Serratia marcescens* was initially considered as an innocuous, non-pathogenic organism but now has been found to cause nosocomial infections [3]. In the hospital, *Serratia* species tend to colonize the respiratory and urinary tracts rather than the gastrointestinal tracts in adults [4]. Most (68%) of *Serratia* bacteraemia occur in males, outbreaks of *serratia* infection appear in neonates and infants and in adults most of the *serratia* infections are isolated although a few nosocomial outbreaks occur [4,5]. *Serratia marcescens* is rarely associated with primary invasive infection and usually produces infection when it comes in contact with a suitably compromised host; and the people usually at risk are those with debilitating or immunocompromising disorders, those treated with broad spectrum antibiotics and patients in the ICU who have been given invasive instrumentation [6]. The predominant mode of spread of *S. marcescens* has been linked to hand-to-hand transmission by hospital personnel [7].

*S. marcescens* are uniformly resistant to a wide range of antibiotics including narrow spectrum penicillins and cephalosporins; cefuroxime, cephamycins, macrolides, tetracyclines, nitrofurantoin and colistin but they are susceptible to flouoroquinolones like ciprofloxacin, moxifloxacin and levofloxacin [8,9].

## 2. CASE REPORT

A 74 year old female presented to the clinic with a six month history of loss of vision in the left eye and one week history of right eye yellowish discharge, itching of the right eye associated with swelling. There was no medical history of Diabetes mellitus and no history of previous contact lens wear or ocular surgery.

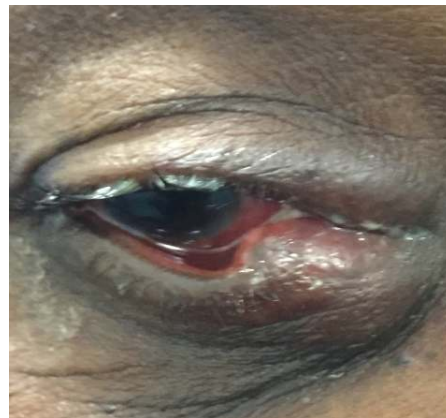
Uncorrected Visual acuity (UCVA) in the right eye was counting fingers at 1 metre, left eye was no perception of light and did not improve with refraction.

Intraocular pressures measured with a handheld Perkins Tonometer were 30 mmHg in the right eye and 42 mmHg in the left eye.

Examination revealed congestion of the right eye with corneal oedema, bilateral pale and cupped discs with cup to disc ratio of 0.90 in the right eye and 1.0 in the left eye.

An initial assessment of right infective conjunctivitis with bilateral advanced glaucomatous optic neuropathy (right eye advanced, left eye absolute glaucoma) was made and she was placed on tabs acetazolamide, latanoprost and timolol eye drops combination nocte in both eyes and ciprofloxacin eyedrops to be used six times a day in the right eye.

One week later, patient presented with swelling on the nasal part of the right lower and upper lids associated with foul smelling, copious, yellowish discharge (Fig. 1). The patient had stopped all ocular medication 2 days before presentation because she was not getting better. Upper and lower lacrimal canalicular massage revealed expression of thick, yellowish, foul smelling discharge occasionally coming out as concretions. A sinus had also formed opening into the tarsal conjunctiva of the lower lid out of which discharge was expressed. An assessment of right lacrimal canaliculitis was made.



**Fig. 1. One week after presentation with swelling of the upper and lower lid canaliculi. Note the purulent discharge and epiphora at the lid margins**

A sample of the discharge was sent to the laboratory for microscopy, culture and sensitivity. The discharge was cultured on Blood, MacConkey, Chocolate and Saboraud agar and it grew on Blood, MacConkey and Chocolate agar plates. The organism was then isolated and identified using the Vitek 2 Compact identification and sensitivity machine.

She was placed on tabs ciprofloxacin 500 mg bd for 1 week, ciprofloxacin eyedrops were changed to moxifloxacin eyedrops every 30 minutes in the right eye, moxifloxacin eye ointment at night in the right eye and she was given a 3 days appointment.

The microscopy, culture and sensitivity done revealed Gram negative bacilli identified as *Serratia marcescens*. It was seen to be sensitive to amikacin, amoxicillin, cetazidime, ciprofloxacin, moxifloxacin, ceftriaxone, gentamycin, levofloxacin.

Four weeks after the first visit, discharge and swelling was markedly reduced, residual swelling over the right upper canaliculus with expression of purulent material which was foul smelling (Fig. 2). Patient was asked to continue topical medications and was asked to come back in 4 weeks.



**Fig. 2. Four weeks after presentation with residual swelling of the upper lid canaliculus**

Two months after the first presentation, her vision in the right eye had improved to 6/36 and the left eye was still no perception of light. The discharge had stopped, the swelling was gone and the sinus had closed. She was asked to continue with her anti-glaucoma medications, continue with her glaucoma clinic follow-up and to come back for follow up in 3 months or if there are any new complaints.

### 3. DISCUSSION

Eye discharge is a common presentation seen by ophthalmologists. Canaliculitis is an infection of the lacrimal canaliculus usually caused by a bacterial pathogen although viral and fungal causes can also be implicated [10]. It is an uncommon chronic condition which is usually misdiagnosed because of its uncommon nature including the fact the constellation of similar features to more common entities also leads to delayed diagnosis [10]. Known organisms that have been associated with canaliculitis include *Actinomyces israeli*, *Mycobacterium abscessus*, *Mycobacterium chelonae*, *Nocardia asteroides*, *Staphylococcus aureus*, *Streptococcus faecalis* [11].

*S. marcescens* ocular infections have been associated with contact lens wear, especially rigid gas-permeable contact lenses and previous eye surgery and it has also been implicated for causing a pink hypopyon in a patient with corneal ulceration [12].

*S. marcescens* is naturally resistant to ampicillin, macrolides, and first-generation cephalosporins [13]. Most strains are susceptible to amikacin, but reports indicate increasing resistance to gentamicin and tobramycin. Quinolones also are highly active against most strains [13].

Definitive therapy should be based on the results of susceptibility testing because multi-resistant strains are common.

### 4. CONCLUSION

This report shows the need for prompt diagnosis for lacrimal canaliculitis and the need for microbiology, culture and sensitivity. It also shows that *Serratia* can be implicated as a cause for not just keratitis and endophthalmitis but also lacrimal canaliculitis in a patient with no known risk factor like Diabetes mellitus, contact lens wear, punctal plugs or previous ocular surgery.

### CONSENT

All authors declare that written informed consent was obtained from the patient for publication of this paper and accompanying images.

### ETHICAL APPROVAL

It is not applicable.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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