Acinetobacter Corneal Ulcer, an Ocular Involvement by an Uncommon Organism; a Case Report and a Review of Literature

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Brief report

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Abstract

Acinetobacter group has been known as gram-negative, opportunistic, aerobic coccobacilli which exists on skin, mucus membranes and in the urinary tract with relatively low virulence. Some predisposing factors including underlying systemic diseases, using broad spectrum antibiotic, mechanical ventilation and etc. could pose the more sever involvement with Acinetobacter. In this study, we reported a patient with Acinetobacter corneal ulcer and a relatively comprehensive review literature about this rarely ocular involvement with this bacteria.

Introduction

Acinetobacter is an Opportunistic invader which comprises physiological flora in human. The main pathogenic species is Acinetobacter baumanni. It mostly exists in the hospital environment and plays a significant role in the colonization and infection of hospitalized patients, especially in patients admitted in intensive care unit (ICU) setting. It is recognized as a rare cause of ocular infections with various manifestations including endophthalmitis, corneal ulcer, keratoconjunctivitis and preseptal cellulitis (1-4). Here, we reported the patient with traumatic sclera laceration who experience corneal ulcer cause by Acinetobacter.

Case Report

A 79 year old obese male admitted in Intensive care unit (ICU) due to falling down because of syncope and diminished vision of his right eye. He had previous history of large abdominal aortic aneurysm which was known recently, without any specific management. Additionally, he had a suspect history of sleep apnea. There was nothing remarkable in his past ocular history. Regarding his condition, we conducted the bed side examination with pen light and indirect ophthalmoscopy. On examination, the uncorrected visual acuity (UCVA) of right and left eyes were light perception (LP) and 20/40 respectively (using near chart). On anterior segment examination of his right eye, there was periorbital edema, mild bloody chemosis mostly at temporal side and clear intact cornea. Additionally, we found a large full thickness scleral laceration about 12 millimeters (mm) diameter with irregular edges at supra temporal side near the limbus. Examination of anterior and posterior segments of left eye was within normal limit except for mild meibomian gland dysfunction and cataract. Due to low oxygen saturation and hemodynamic instability of our patient, the physician of ICU did not let us to repair the scleral laceration, hence; eye shield was placed on his eye and systemic antibiotic was initiated (Ceftazidim, Vancomycin and Clindamycin). We visit the patient on daily basis.

After five days, we noticed the exacerbation of the bloody chemosis that push the lids outward that create exposure keratitis which resulted in corneal ulcer at the lower third part of cornea with a large corneal epithelial defect about 6*3 mm diameter with infiltration (two sites of infiltration about 1 *1 mm) but far from the site of scleral laceration. We started the empiric broad spectrum antibiotics (fortified eye drops of Vancomycin 5% and Ceftazidim 5%). The corneal ulcer was scraped for microbiologic examination

and culture and a large lateral tarsorrhaphy was done. Until the preparation of antibiogram result, the ulcer progressed in the size of defect and infiltration. The culture of sample revealed Acinetobacter baumanni, while Culture of blood specimens gave negative results. The antibiogram showed resistance of the organism to all antibiotics but Colistin. So, regarding consultation with an infectious disease specialist, aggressive treatment was administered: Colistin (3 million units administered intravenously twice daily and Topical Colistin drop (0.19%) ever 3 hours. Unfortunately, the patient passed away 2 days later due to low blood pressure and cardiac arrest. But we found no changes in the corneal situation before his death.

Discussion

Among the large family of bacteria, Acinetobacter group has been known as gram-negative, nonfermentative, aerobic coccobacilli which widely exists on skin, mucus membranes and in the urinary tract with relatively low virulence. However, its virulence would aggravate in patients with impaired hosts' defenses or using broad-spectrum antibiotics in hospital. In contrast to patients who are admitted in the ICU, the rate of community acquired form of Acinetobacter infection is very low (5).

The ocular infections caused by Acinetobacter species are very rare. Patients with exposure of cornea, history of contact lens usage, history of penetrating keratoplasty (PKP), and immunosuppression are vulnerable for Acinetobacter keratitis and ocular infection (2). To best of our knowledge, our study is the first one that reported corneal ulcer by Acinetobacter following not repaired scleral laceration in a patient without mechanical ventilation and any evidences of systemic infection. However, our patient was in a compromised condition and had been admitted in ICU.

There are very few studies reported the ocular involvement provoked by Acinetobacter. It could demonstrates various ocular features. On the other hand, it feasibly could be co infected with fungi and the other bacteria (2, 3, 6, 7). R Roy et al. described the 4 cases of endophthalmitis caused by Acinetobacter baumanni; 3 of endophthalmitis were post cataract surgeries and the last one occurred in a patient with previous corneal repair due to trauma. All these patients underwent intravitreal antibiotic (Ciprofloxacin) and vitreoretinal surgical intervention. Finally, ocular condition of 3 of them deteriorated (one resulted in evisceration, one in phthisic eye and the other one developed retinal detachment, post vitrectomy) and only 1 patients reached to the visual acuity of 20/200 (8). Recently a case of Acinetobacter baumanni endophthalmitis has been reported, which resulted from intravitreal Ranibizumab injection (9).

In 2004, one study showed that one asymptomatic infectious cornea donor could result in post-PKP corneal ulcer in one cornea recipient and post PKP endophthalmitis in the other one (10). Additionally, it indicates the fact that we might be consider this problem in utilizing the corneal graft of patients who were admitted in ICU even without any apparent corneal infiltration.

In consensus with our finding, one study showed that exposure keratitis in patients with systemic diseases and admission in ICU would lead to Acinetobacter corneal ulcer which could be treated by

antibiotic and tarsorrhaphy. In contrast to ours, the isolated Acinetobacter from urine that might be a sign of generalized infection with this organism with secondary corneal involvement (2).

Association of Acinetobacter species with soft contact lens–induced infiltration has been proved previously (11, 12). Acinetobacter species were isolated from 16 (13%) of 126 patient corneal infiltration samples. this study demonstrated that patient's hand microbiota could be recognized as a possible source of Acinetobacter species which be transferred to ocular surface via contact lens (12).

Several studies revealed the trauma induced endophthalmitis with Acinetobacter, due to corneoscleral lacerations (13, 14). Additionally, Crawford et al reported the recurrent endophthalmitis that caused by multiple organisms including Acinetobacter. In this case, the contamination source is presumed to be self-contamination as a result of utilizing non-sterile antibiotic drops (1).

Acinetobacter species has been associated with keratitis and corneal ulcers caused in different settings have been reported (3, 15-17). A report from Korea showed that in contrast to most of bacterial keratitis, corneal ulcers induced by Acinetobacter usually were placed at peripheral site of the cornea (3). However, in our patient, the ulcer located at the lower third of the cornea that may explained by exposure keratitis in this special case.

De Oliveira Ribeiro et al. reported a history of 70-year-old patient who underwent phacoemulsification and intraocular lens (IOL) implantation. On postoperative day (POD) 9, he referred with severe eye pain and redness. B-mode ultrasound scanning showed the vitreous condensation, in favor of endophthalmitis. The posterior vitrectomy and sampling vitreous humor for culture and antibiogram was performed. The antibiogram showed multi drug resistant Acinetobacter baumanni. Hence, due to devastating pain and no response to antibiotic therapy, ocular evisceration was performed for the patient (9).

In conclusion, we should keep in mind to consider Acinetobacter as probable pathogen even in healthy patients but especially in patients stayed at ICU, even while may not show any evidence of Acinetobacter bacteremia simultaneously. It may not response to empiric treatment and progress to a devastating condition. Additionally, hand hygiene among ICU staff would obviate many ocular infections including Acinetobacter keratitis and corneal ulcer.

Abbreviations

ICU: intensive care unit, UCVA: uncorrected visual acuity, LP: light perception, mm: millimeters, PKP: penetrating keratoplasty, IOL: intraocular lens, POD: postoperative day

Declarations

Ethics approval and consent to participate:

The Institutional Review Board of Iran University of Medical Sciences in Tehran, Iran approved the study protocol. This study adhered to the tenets of the Declaration of Helsinki. This report does not contain any personal identifying information of the patient.

Consent for publication:

Not applicable.

Availability of data and materials:

Not applicable.

Competing interests:

The authors declare that they have no competing interests.

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Authors' contribution:

Mahsa Sardarinia: Concept, Design, Data Collection and/or Processing, Literature Search, Roles/Writing – original draft,

SeyedHossein Rabani: Investigation,Methodology, Roles/Writing – original draft

Gholamhoseyn Aghai: Investigation,Methodology,

Leila Ghiasian: Project administration, Supervision, Validation, Visualization

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Figures

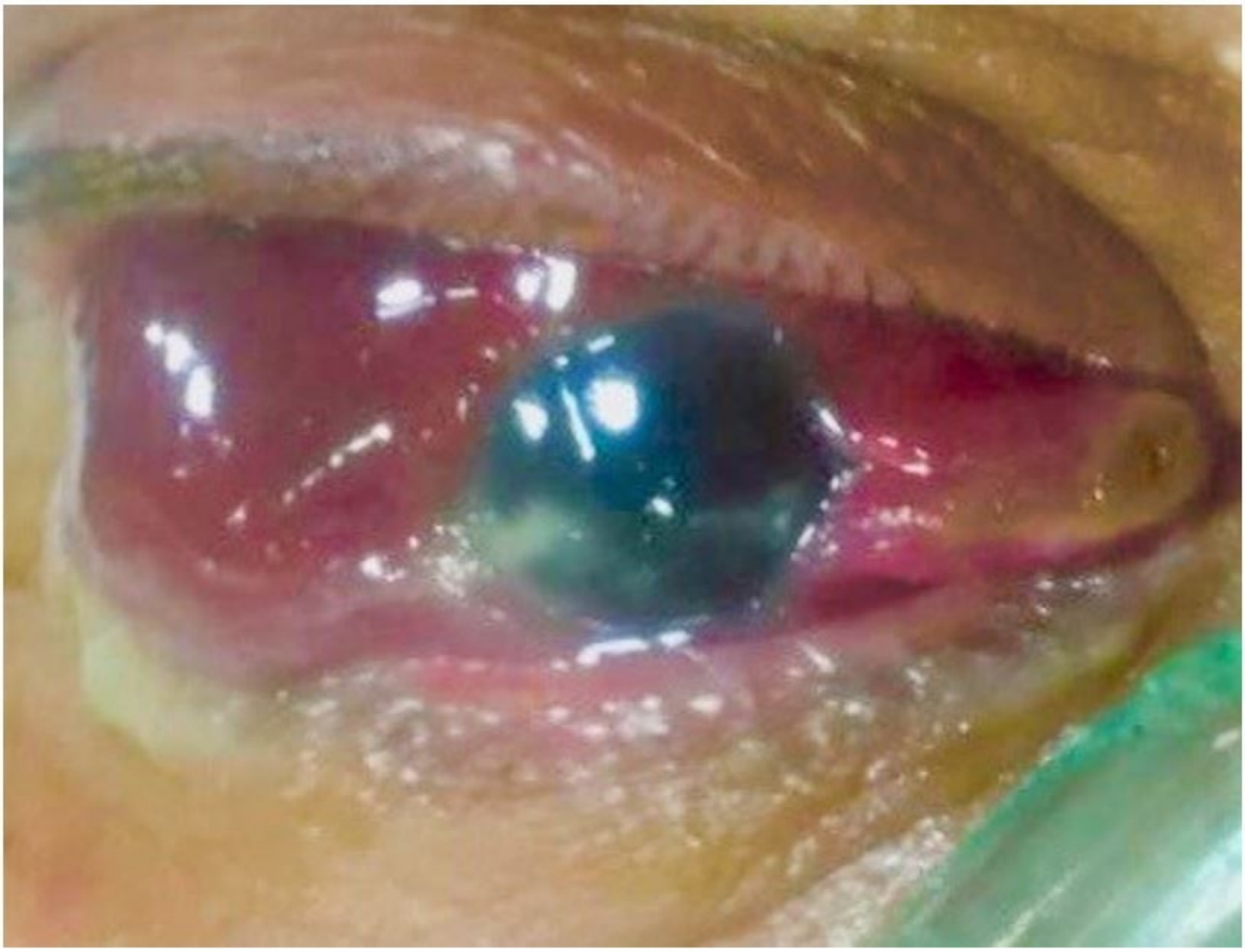
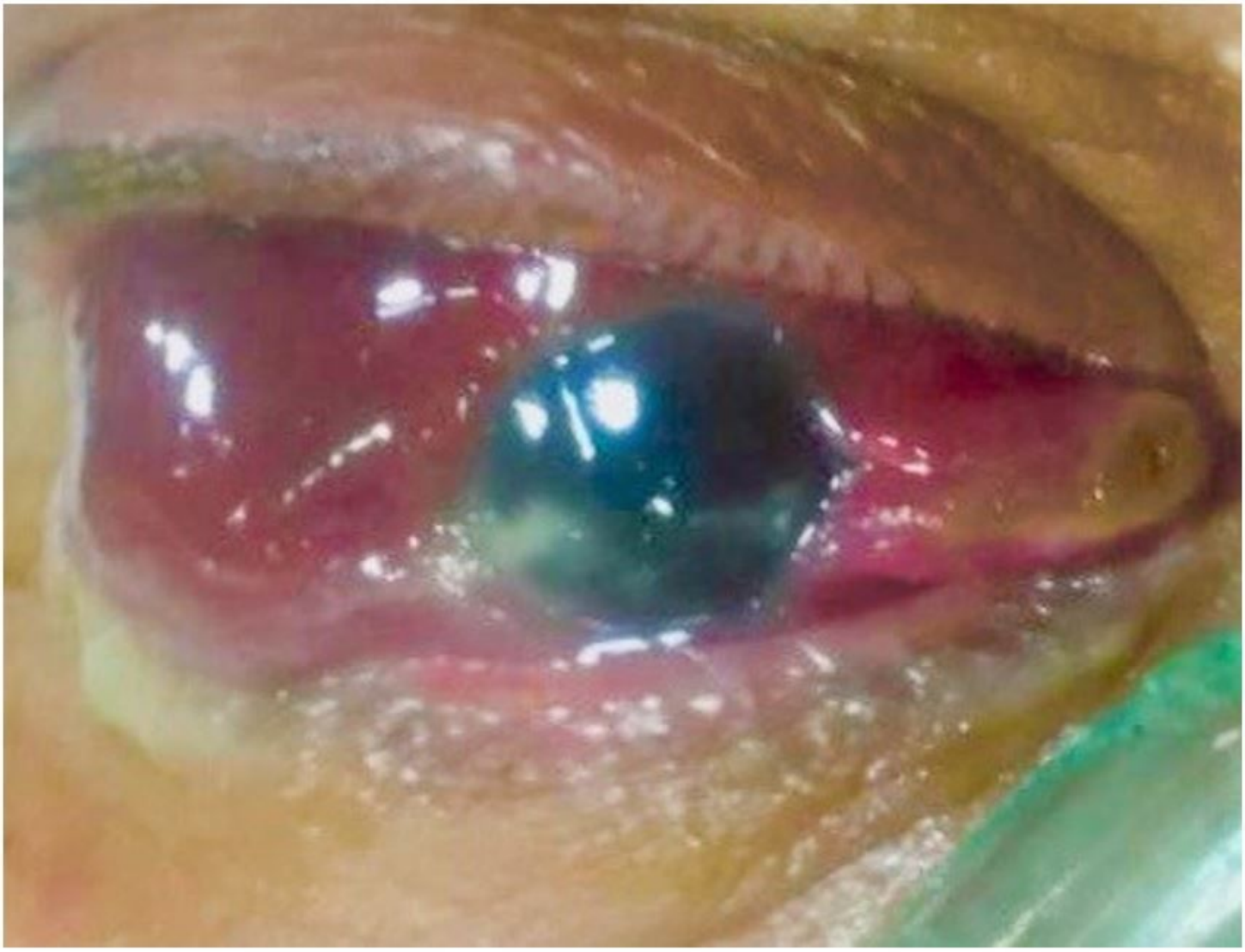


Figure 1

Photo showed severe bloody chemosis and corneal epithelial defect with infiltration.



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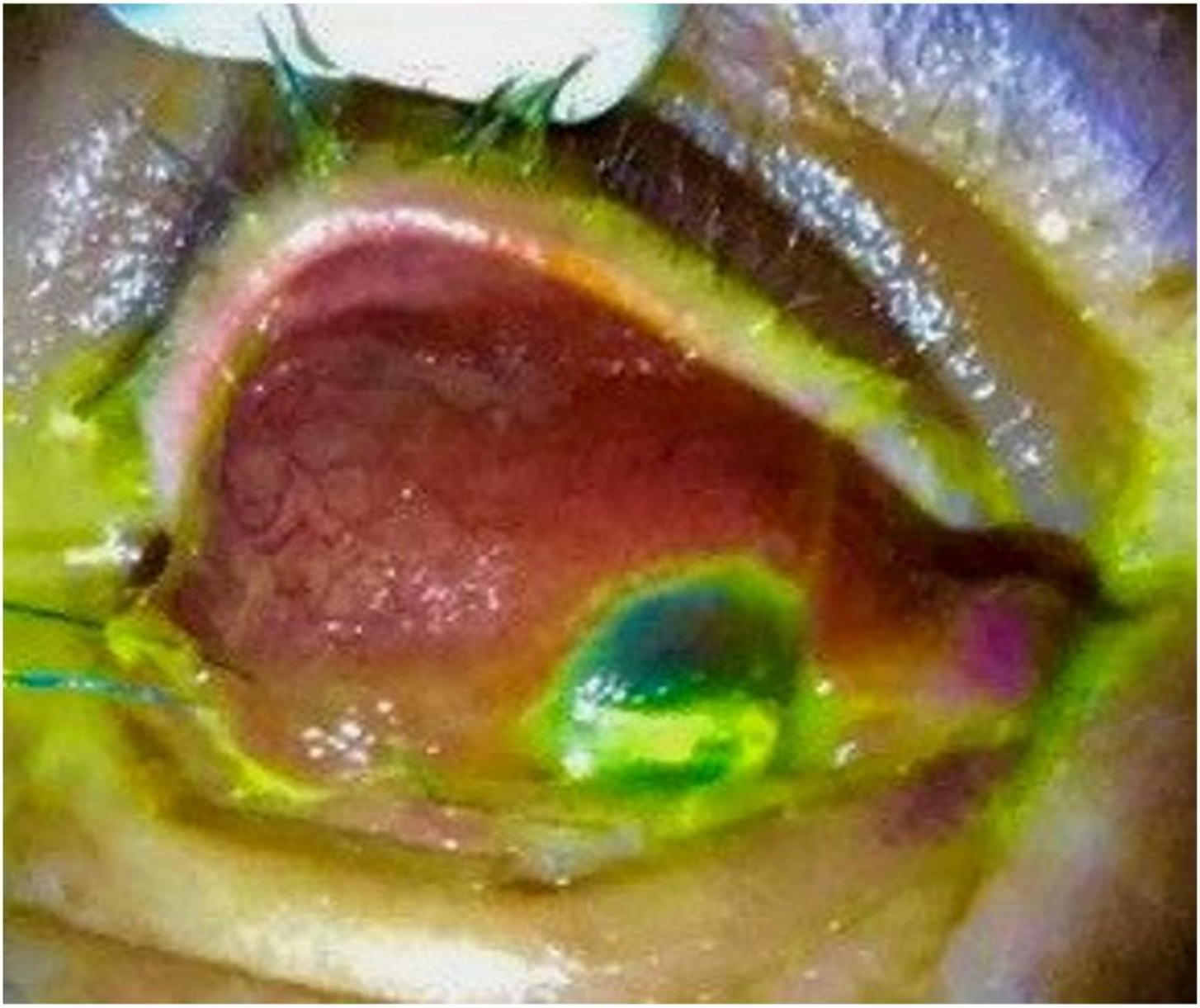
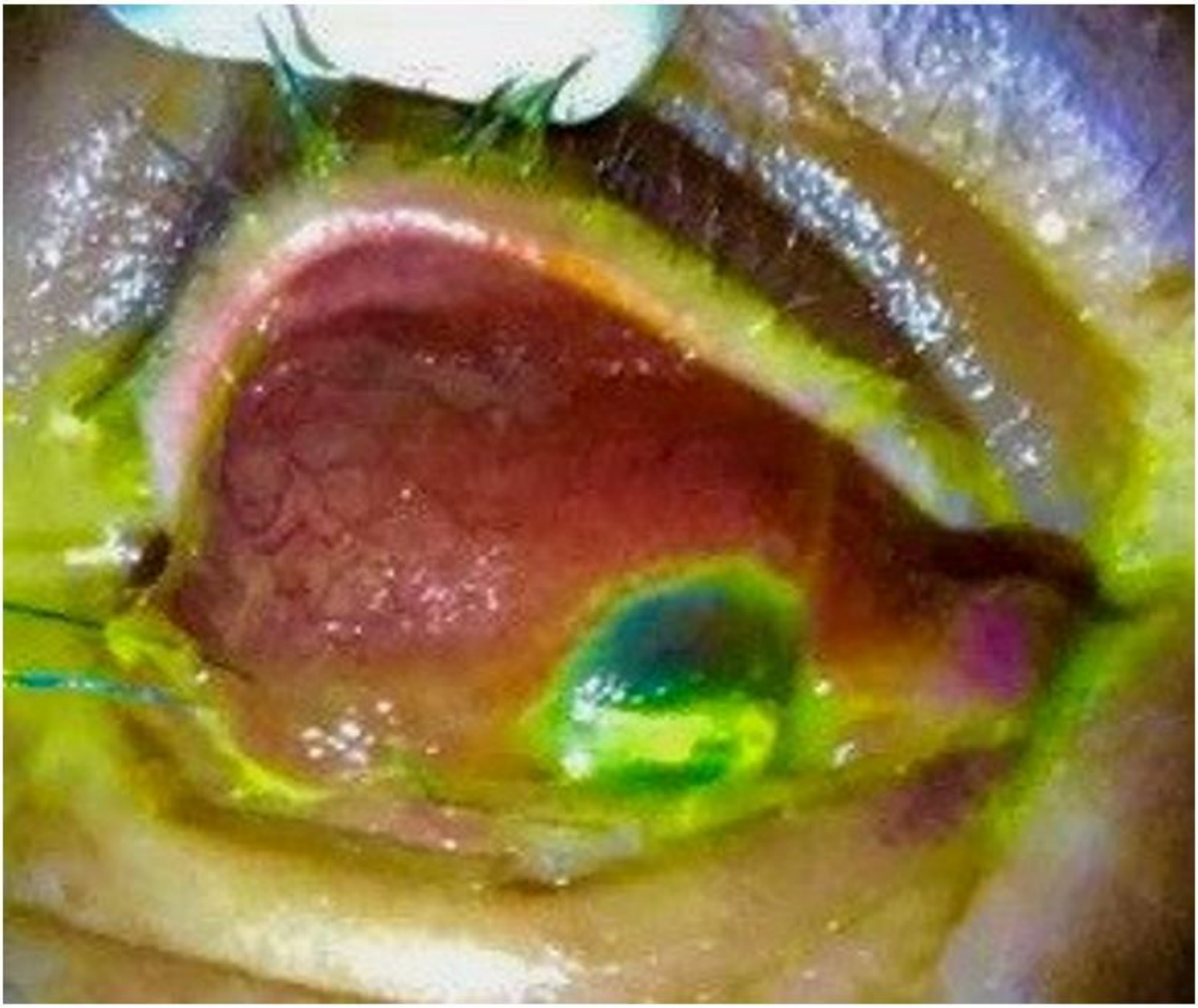


Figure 2

A fluorescein stain image showed no improvement in corneal ulcer, one day after starting topical Colistin drop.



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