

THE DOUBLE TROUBLE OF FUNGAL ULCERS & DIABETES - A CHALLENGING
CASE REPORT

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ABSTRACT

Corneal ulcers are a common sight threatening condition that requires prompt diagnosis & treatment. Fungal corneal ulcers, in particular, are a challenging clinical entity that can be complicated by underlying medical conditions such as Diabetes. We report a challenging case of a 35 years old patient who was diagnosed with fungal corneal ulcer in Right eye. He was started on anti-fungal medications, topical antibiotics eye drops. Despite receiving appropriate treatment patient's condition did not improve. After investigating, the patient was found to have uncontrolled diabetes & aggressive blood sugar control measures were taken. The patient also experienced a Central Retinal Vein Occlusion (CRVO) during the course of his treatment, which was promptly and effectively managed. Patient has improved symptomatically & he is currently on treatment & follow up from Ophthalmology department at Dr RPGMC Kangra at Tanda. This case highlights the importance of prompt & aggressive management of fungal corneal ulcers in patients with diabetes to avoid complications. Additionally, it underscores the necessity of routine fundus examinations for patients with diabetes to identify and address vision-threatening diseases promptly. Timely intervention and regular eye care are essential to maintain the ocular health and vision of individuals living with diabetes.

KEYWORD:- Corneal ulcer, Diabetes, Fungal Keratitis, CRVO, Macular edema.

INTRODUCTION

Mycotic or fungal keratitis (FK) is a severe and potentially blinding infection of the cornea (Fig-1) and is considered an ophthalmic emergency.^[1,2] It is one of the leading causes of microbial keratitis (MK) or corneal ulcer. Presenting clinical features such as corneal infiltrates with feathery edges and/or raised surface, intact epithelium with deep stromal involvement, satellite lesions, endothelial plaques, lack of improvement with antibiotics and worsening with steroids are suggestive of fungal keratitis.^[3] Accurate diagnosis remains challenging as it is frequently not possible to clinically distinguish bacterial and fungal MK & microbiology services are usually unavailable.^[4]

It is widely recognized that individuals with diabetes face an increased susceptibility to fungal infections, with diabetes mellitus (DM) emerging as the foremost systemic risk factor for the development of fungal keratitis. DM has also been shown to be an independent risk factor for the severity of fungal keratitis. Mechanistically, long-term hyperglycemia may change the micro environment of ocular surface, such as the tear components, ocular commensal, and the enzyme activity,

which renders the fungal adherence, proliferation, and deep-layer penetration easier.^[5]

RVO (Retinal Vein Occlusion) is the second most common retinal vascular disorder and a relatively common and frequent cause of visual loss, resulting from macular edema and retinal ischemia.^[6] People with diabetes mellitus (DM) are at a heightened risk of developing Retinal Vein Occlusion, underscoring the crucial significance of regular fundus examinations for these individuals.

Diabetes is reported as a major risk factor for fungal infection, and diabetic patients shows more severe clinical manifestations and worse prognoses. The interaction between diabetes & fungal corneal ulcer poses unique challenges for both patients & doctors.

Case description

A 38-year-old male presented to Eye OPD at Dr RPGMC Kangra at Tanda with redness, watering, pain & progressive diminution of vision in his right eye since 1 and a half month. According to the patient, he was sitting near a fireplace after which he started having foreign body sensation & pain in his right eye. Initially the

patient received treatment at a private hospital nearby for a month where he was prescribed antibiotic eye drops & steroid eye drops. After one month he consulted a different hospital where he was provisionally diagnosed as fungal keratitis & was started on anti-fungal medications. Upon no improvement in his symptoms, he then came to Dr RPGMC Tanda. After receiving detailed

history & performing ocular examination, corneal scrapings were collected & patient was advised routine blood investigations. Meanwhile the anti-fungal drugs (tab Itraconazole 100mg Bd, e/d natamycin & e/d voriconazole) were continued along with antibiotic eye drops & IOP lowering agents.



Fig. 1: Central corneal ulcer with hypopyon.

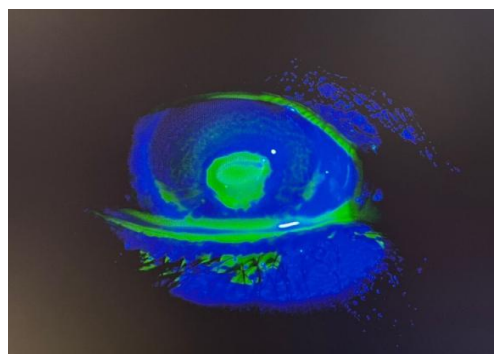


Fig. 2: Fluorescein staining of the defect.

On the day of presentation, patient's initial visual acuity was HMCF (hand movement close to face). As we can see in Fig. 1 & 2, patient had a para-central oval shaped corneal ulcer measuring approximately 3*3.5mm & obscuring more than half of pupillary area with rolled out margins & infiltrates with immobile hypopyon.

Corneal scrapings results showed fungal element presence (KOH & gram stain) along with macroconidia

with transverse septa, dematiaceous fungi. Culture showed no growth. The most interesting finding to note were his blood test results. Patient's random blood sugar level was found to be 496mg/dl. Note that patient was not a known case of DM/HTN. Patient was then admitted under our department & was started on oral & injectable hypoglycemic agents along with dietary restrictions. Daily monitoring of his blood sugar levels was done.

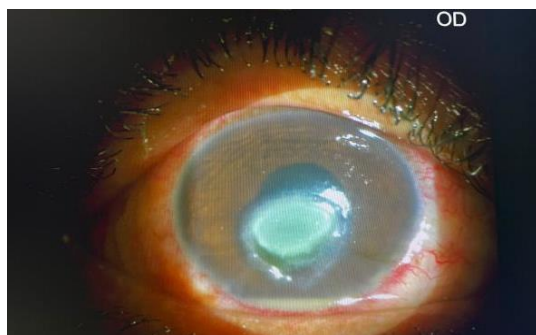


Fig. 3: Day 10 post treatment.



Fig. 5: Day 45 post treatment.



Fig. 4: Day 30 post treatment.



Fig. 6: Day 60 post treatment.

During the course of his treatment, photographic documentation was done (fig3,4,5,6). We saw drastic

improvement in patient's symptoms after aggressive blood sugar control for 1 month.

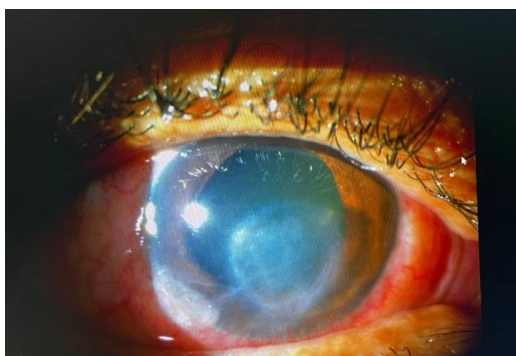


Fig. 7: Healed corneal ulcer with opacity.

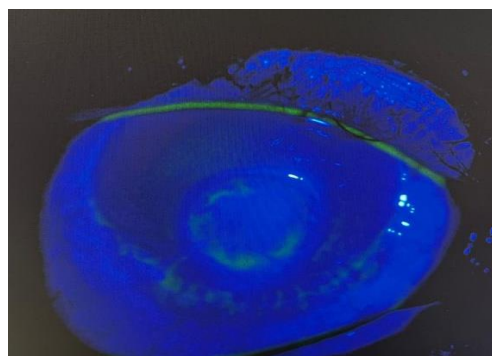


Fig. 8: Minimal staining of the healed ulcer.

Figure 7& 8 shows the current condition of the patient. His current visual acuity had improved up to finger count at 2 meters. There was corneal scarring & vascularisation with resolved hypopyon & epithelial defect.

Due to the limited improvement in vision despite a substantial reduction in the size of the ulcer, we began to suspect the presence of posterior segment pathology. Initially patient's fundus details could not be appreciated due to media haze secondary to the healing corneal ulcer. Once the ulcer healed, we were able to gain a thorough understanding of the fundus details. We detected the presence of central retinal vein occlusion (CRVO) accompanied by macular edema in the same eye which explained the cause of limited improvement in vision. The patient subsequently underwent intravitreal ranibizumab treatment, and through a series of follow-up visits, the patient's recent visual acuity has improved to 6/18. The patient is presently under our department's follow-up care and is maintaining their prescribed medication regimen.

Usually, in cases where a patient presents with a corneal ulcer, there is a potential risk of the posterior segment, particularly the retina and its blood vessels, being overlooked or receiving less attention. This is because the immediate concern often focuses on the corneal ulcer, which is a front-of-eye issue and can be visually striking. So, it's crucial for healthcare providers to be vigilant and recognize that even in the presence of a corneal ulcer, individuals with diabetes remain at risk for posterior segment complications such as diabetic retinopathy, retinal vein occlusions, or other retinal issues.

DISCUSSION

This case highlights the intersection of fungal keratitis (FK) and diabetes mellitus (DM), emphasizing the diagnostic and therapeutic challenges inherent in managing fungal ulcers complicated by systemic diseases. The 38-year-old patient presented with a recalcitrant fungal corneal ulcer that only began responding to treatment after aggressive blood sugar control. Notably, the case became more complex due to the development of Central Retinal Vein Occlusion (CRVO), further complicating the patient's visual prognosis. Diabetes is well-documented as a risk factor

for both fungal keratitis and retinal vascular disorders such as CRVO. Hyperglycemia creates a conducive environment for fungal adherence, proliferation, and invasion of ocular tissues, as corroborated by Thomas et al. (2005), who identified clinical features aiding FK diagnosis and cautioned against steroid use due to the risk of worsening fungal infections. The use of steroids in this case may have exacerbated the condition.^[2]

Burton et al. (2011) further underscored poor outcomes in microbial keratitis cases compounded by systemic diseases, as seen in this case where the patient did not show significant improvement despite antifungal agents until systemic glucose levels were controlled.^[1] Wang et al. (2020) highlighted diabetes as a significant risk factor for retinal vein occlusion, which aligns with the development of CRVO in this patient during the course of treatment.^[6] Hoffman et al. (2021) emphasized the global burden of filamentous FK and the importance of aggressive management, reflected in the patient's improvement with systemic glucose control and targeted antifungal therapy.^[4] Additionally, the late identification of CRVO in this patient underscores the necessity of comprehensive ocular evaluations in diabetic patients, as posterior segment complications can remain undetected due to media opacity but significantly impact visual prognosis. This case reinforces the importance of integrated management, incorporating systemic and ocular care, particularly in diabetic patients with FK, and highlights the critical need for routine fundus examinations and cautious steroid use, especially in suspected or confirmed fungal infections.

CONCLUSION

This case clearly serves as a reminder of the importance of early & correct diagnosis as well as treatment of both fungal corneal ulcers & diabetes. It also highlights the necessity of regular fundus examinations for patients with diabetes. These examinations are essential because they allow for the comprehensive assessment of not only the anterior segment but also the posterior segment of the eye. By doing this, healthcare professionals can detect and manage complications effectively of corneal ulcers as well as Diabetes.

REFERENCES

1. Burton MJ, Pithuwa J, Okello E, Afwamba I, Onyango JJ, Oates F, Chevallier C, Hall AB. Microbial keratitis in East Africa: why are the outcomes so poor?. *Ophthalmic epidemiology*, 2011; 1, 18(4): 158-63.
2. Thomas PA, Leck AK, Myatt M. Characteristic clinical features as an aid to the diagnosis of suppurative keratitis caused by filamentous fungi. *British Journal of Ophthalmology*, 2005; 1, 89(12): 1554-8.
3. Bourcier T, Sauer A, Dory A, Denis J, Sabou M. Fungal keratitis. *Journal francais d'ophtalmologie*, 2017; 1, 40(9): e307-13.
4. Hoffman JJ, Burton MJ, Leck A. Mycotic keratitis—a global threat from the filamentous fungi. *Journal of Fungi*, 2021; 7(4): 273.
5. Leger AJ, Desai JV, Drummond RA, Kugadas A, Almaghrabi F, Silver P, Raychaudhuri K, Gadjeva M, Iwakura Y, Lionakis MS, Caspi RR. An ocular commensal protects against corneal infection by driving an interleukin-17 response from mucosal $\gamma\delta$ T cells. *Immunity*, 2017; 18, 47(1): 148-58.
6. Wang Y, Wu S, Wen F, Cao Q. Diabetes mellitus as a risk factor for retinal vein occlusion: a meta-analysis. *Medicine*, 2020; 1, 99(9): e19319.