

# Recurrent *Mycobacterium Abscessus Complex* Endophthalmitis Post Cataract Surgery

Adzleen Mohmood (✉ [adzleenm@gmail.com](mailto:adzleenm@gmail.com))

Hospital Universiti Kebangsaan Malaysia: Pusat Perubatan Universiti Kebangsaan Malaysia  
<https://orcid.org/0000-0003-0740-4254>

Norshamsiah Md Din

Hospital Universiti Kebangsaan Malaysia: Pusat Perubatan Universiti Kebangsaan Malaysia

Nor Azita Ahmad Tarmizi

Kuala Lumpur General Hospital: Hospital Kuala Lumpur

Hamisah Ishak

Kuala Lumpur General Hospital: Hospital Kuala Lumpur

---

## Case Report

**Keywords:** Mycobacterium, endophthalmitis, surgery

**Posted Date:** September 29th, 2021

**DOI:** <https://doi.org/10.21203/rs.3.rs-919275/v1>

**License:** © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

---

# Abstract

**OBJECTIVE :** To report a case of recurrent mycobacterium abscessus complex endophthalmitis post cataract surgery, its clinical features and complex course, management, and treatment outcome.

**METHOD :** A retrospective medical chart review to determine its clinical features, management and treatment outcome.

**RESULT :** A 70 year-old female was referred for post cataract surgery chronic endophthalmitis five months after right eye cataract surgery. Despite intravitreal and topical antibiotic, she had multiple episodes of recurrent hypopyon uveitis upon tapering the topical steroid. This was followed by formation of whitish, fluffy, cotton-like material in the anterior chamber (AC) with scleral abscess. AC washout and incisional biopsy of the sclera were done followed by pars plana vitrectomy, intraocular lens explantation, and intravitreal antibiotic injection. Culture revealed Mycobacterium abscessus complex . Intravitreal vancomycin, ceftazidime and systemic clarithromycin, rifampicin and intramuscular streptomycin were commenced and her condition improved. However, hypopyon uveitis and scleral abscess recurred. Intravitreal amikacin, systemic amikacin, linezolid, clarithromycin and ciprofloxacin were commenced. Her eye remained quiescent till date without the need for evisceration.

**CONCLUSION :** Mycobacterium abscessus complex endophthalmitis post cataract surgery is rare. It often induces chronic recurrent or persistent intraocular inflammation. Diagnosis is often delayed due to low clinical suspicion. Keyword: endophthalmitis, non-tuberculous mycobacterium, cataract surgery, hypopyon uveitis, scleral abscess, fungal uveitis

## Case Description

A 70-year-old female with Diabetes Mellitus, was referred from district ophthalmologist for chronic post cataract surgery endophthalmitis five-months after her right eye cataract surgery. She developed two episodes of hypopyon uveitis and vitritis in May and June 2017. The referral hospital did both aqueous and vitreous tapping, which revealed no growth. She responded with empirical intravitreal vancomycin (2mg/0.1ml) and ceftazidime (2mg/0.1ml), topical vancomycin, ceftazidime, dexamethasone and oral ciprofloxacin 750mg bd for two weeks. Tuberculin skin test (TST), chest Xray, blood and urine culture were negative. Connective tissue disease, autoimmune disease, tumor marker screening, MRI orbit and brain were unremarkable.

When she first referred to tertiary care in June 2017, the right eye (RE) visual acuity (VA) was 6/18 with anterior chamber (AC) cells of 3+ and mild vitritis. Otherwise, there was no retinitis, vasculitis or choroiditis. The optical coherence tomography showed cystoid macular edema. Fundus fluorescein angiogram showed petaloid leakage at the macula and a hot-disc. She responded well to topical steroids, ceftazidime and vancomycin. In September 2017, she developed recurrent hypopyon uveitis with fluffy white material in AC, scleral abscess and marked vitritis (Figure 1). AC washout and scleral biopsy were performed. RE condition worsened with recurrent hypopyon and vitritis, hence trans-pars planar

vitrectomy (TPPV), intraocular lens (IOL) explant were performed. She received two times intravitreal vancomycin (2mg/0.1ml), ceftazidime (2mg/0.1ml) and amphotericin B (0.005mg/0.1ml). Intra operative findings showed dense vitreous abscess, diffuse retinal abscess and haemorrhages. Initial acid fast bacilli stained positive. Infectious Disease team commenced her on intramuscular Streptomycin 1gram , oral Rifampicin 600 mg od, oral Clarithromycin 500mg od and topical moxifloxacin and dexamethasone. Two weeks later, culture grew *MAC* sensitive to all the antimycobacterial given. In November 2017, the eye remained quiescent, visual acuity of 1/60 (Figure 2). Intramuscular Streptomycin 1g three times per week for 2 months, oral Rifampicin 600 mg od and oral Clarithromycin 500mg od regime were continued for 9 months.

However in July 2018, she developed recurrent hypopyon uveitis, iris nodules, scleral nodule and vitritis (Figure 3). We repeated AC and intravitreal tap sending for acid fast bacilli, gram stain and culture. Intravitreal amikacin (0.4mg/0.1ml) and vancomycin (0.2mg/0.1ml) were given. Systemic intravenous amikacin 750mg daily for one month and IV Linezolid 600mg od for 2 weeks. Unfortunately, patient`s renal function deranged. The therapy was adjusted to renal dosage of oral clarithromycin 250 mg bd and ciprofloxacin 500 mg for 6 months duration. She has completed treatment with BCVA of hand movement (Figure D). RE was aphakic, anterior segment was quiet, optic disc was pallor, the vessels were attenuated and pigmentary changes at macular area. Her RE remain quiescent for 18 months since her last visit.

## Discussion

*MAC* is a group of rapidly growing, multidrug-resistant, non-tuberculous Mycobacterium (NTM) species that are ubiquitous in soil and water. Isolated postoperative endophthalmitis caused by *MAC* after [cataract surgery](#) is rarely reported. It also has been reported in infective keratitis, [1]orbital and periocular infections, [2] cornea transplant surgery,[3]and post LASIK surgery [4]. Hsu et al. and Hung et al. reported recently on a cluster of post-cataract endophthalmitis outbreak in Taiwan [5,6] and Poulouse et al reported in five cases in Southern India [7].

In our patient, the clinical pictures of prolonged ocular inflammation, recurrent hypopyon uveitis, fluffy material in AC, iris nodules, scleral abscess, warrant a high index of suspicion of either fungal or mycobacterial endophthalmitis as described in literatures [2,5,7–10]. NTM uveitis may mimic fungal, herpes, or sterile inflammation. The use of steroid may hinder the actual isolation of the pathogen. This explained the difficulty of achieving the diagnosis.

About a third of eyes will deteriorate and subsequently become atrophied or eviscerated. Another two-third will enter a quiescent-recurrent stage, ending with poor visual outcome.[9] High risk of recurrence may be due to the proposed nature of the disease, potential nidus of residual infection in sclera, iris or ciliary body despite debridement [8], formation of a biofilm impeding the penetration of antibiotics, inducible resistance to clarithromycin[11], and the possibility of incorrect identification of the causative organism [2].

In-vitro studies and case series reported that Amikacin is highly effective in treating *MAC* in their retrospective study. [12] Brown-Elliott et al also reported that the percentage of their isolates of *MAC* susceptible to amikacin, clarithromycin, ciprofloxacin, levofloxacin, moxifloxacin, and gatifloxacin were 100%, 100%, 21.6%, 5.4%, 21.6%, and 48.6%, respectively.[13]

Polymerase chain reaction (PCR) and gene sequencing are rapid, specific, and cost-effective means of identification of NTM to the species level. However, it was not widely available. Genetic loci that typically used for mycobacteria species identification with PCR or gene sequencing include the *16S rRNA* gene, the 16S–23S spacer region, the *rpoB* gene, and the *hsp65* gene.[5,14]

Surgical debridement by vitrectomy, removal of lens–capsule complex with concurrent antibiotic irrigation, intravitreal of antibiotics and evisceration were also suggested treatment in most published literature.[9,15] Hung et al. found that eyes after vitrectomy is associated with prolonged quiescent stage. [8] Luckily, for our patient, the RE remain quiescent and did not require evisceration.

Clinicians should have a high index of suspicion of NTM endophthalmitis when faced with a challenging diagnosis as it may cause potential detrimental outcomes. A combination of antibiotics based on culture sensitivities and therapeutic surgical intervention are needed to control the infection.

## Abbreviations

MAC

*Mycobacterium abscessus complex*

AC

anterior chamber

NTM

non-tuberculous Mycobacterium

TST

Tuberculin skin test

RE

Right eye

VA

visual acuity

TPPV

trans-pars planar vitrectomy

IOL

intraocular lens

LASIK

Laser assisted in-situ keratomileusis

PCR

Polymerase chain reaction

# Declarations

## Acknowledgments

The authors would like to thank Director General of Ministry of Health Malaysia for giving the permission to publish the case report and Infectious Disease Team Hospital Kuala Lumpur for co-manage the patient.

## Contributions

AM, NAAT, HI conceived and designed the research. AM collected the data. AM and NMD wrote the paper. All authors have read and approved the manuscript.

## Corresponding author

Correspondence to AM

## Ethical approval

This study follows the tenets of the Declaration of Helsinki. Ethical approval was waived because it is a case report.

## Consent for publication

Written consent for publication of personal information and images was obtained from patient

## Funding

This research did not receive any specific grants from funding agencies in the public, commercial, or not-for-profit sectors.

## Declaration of Competing Interests

None.

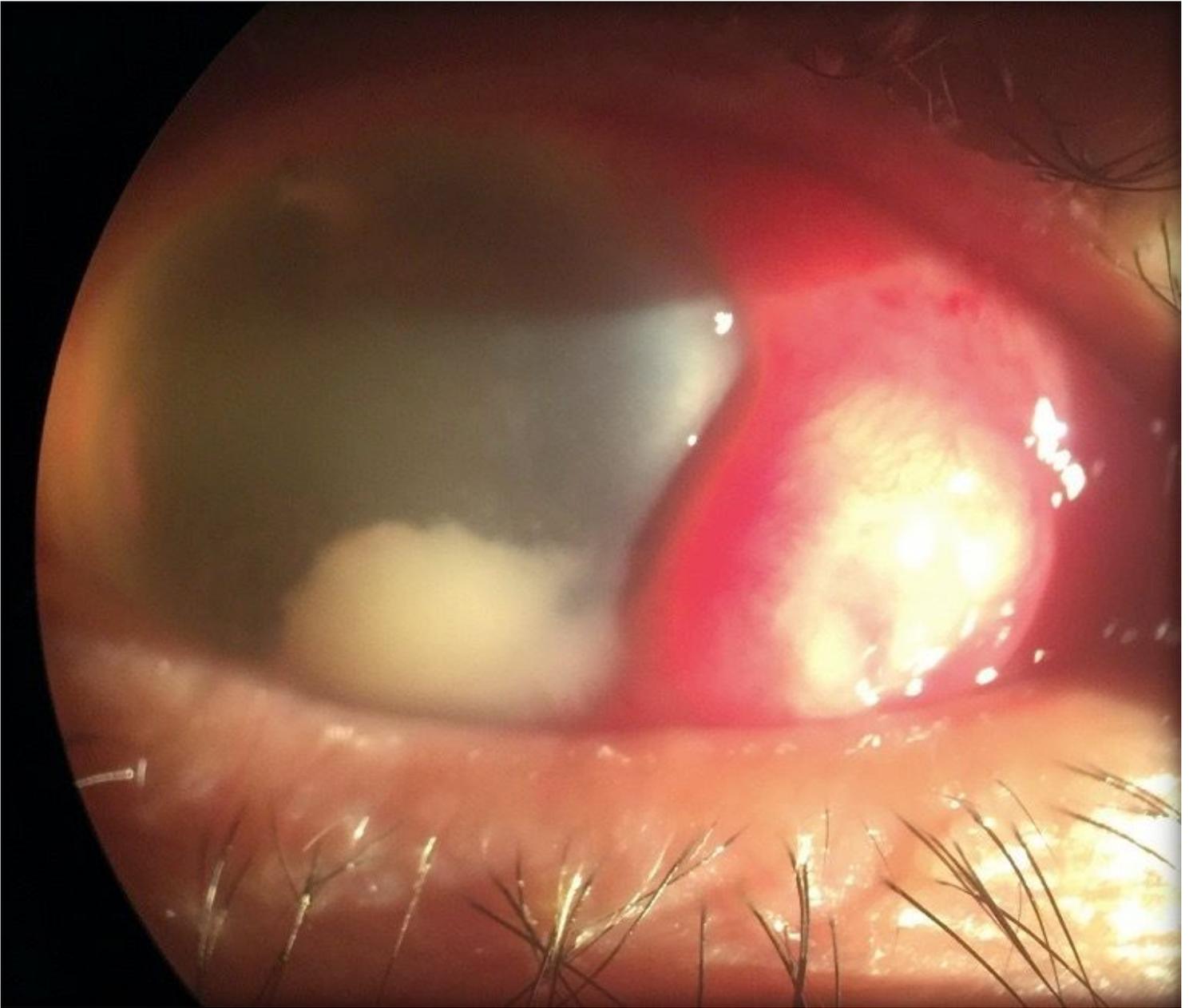
The authors declare that they have no competing interests

# References

1. Lee M-R, Sheng W-H, Hung C-C et al. Mycobacterium abscessus Complex Infections in Humans. *Emerging Infectious Diseases* 2015;21–46. doi:10.3201/2109.141634
2. Hindman H, Venkateswaran N, Yeane G et al. Recurrent nontuberculous mycobacterial endophthalmitis a diagnostic conundrum. *Clinical Ophthalmology* 2014;;837–840. doi:10.2147/OPHTH.S56670

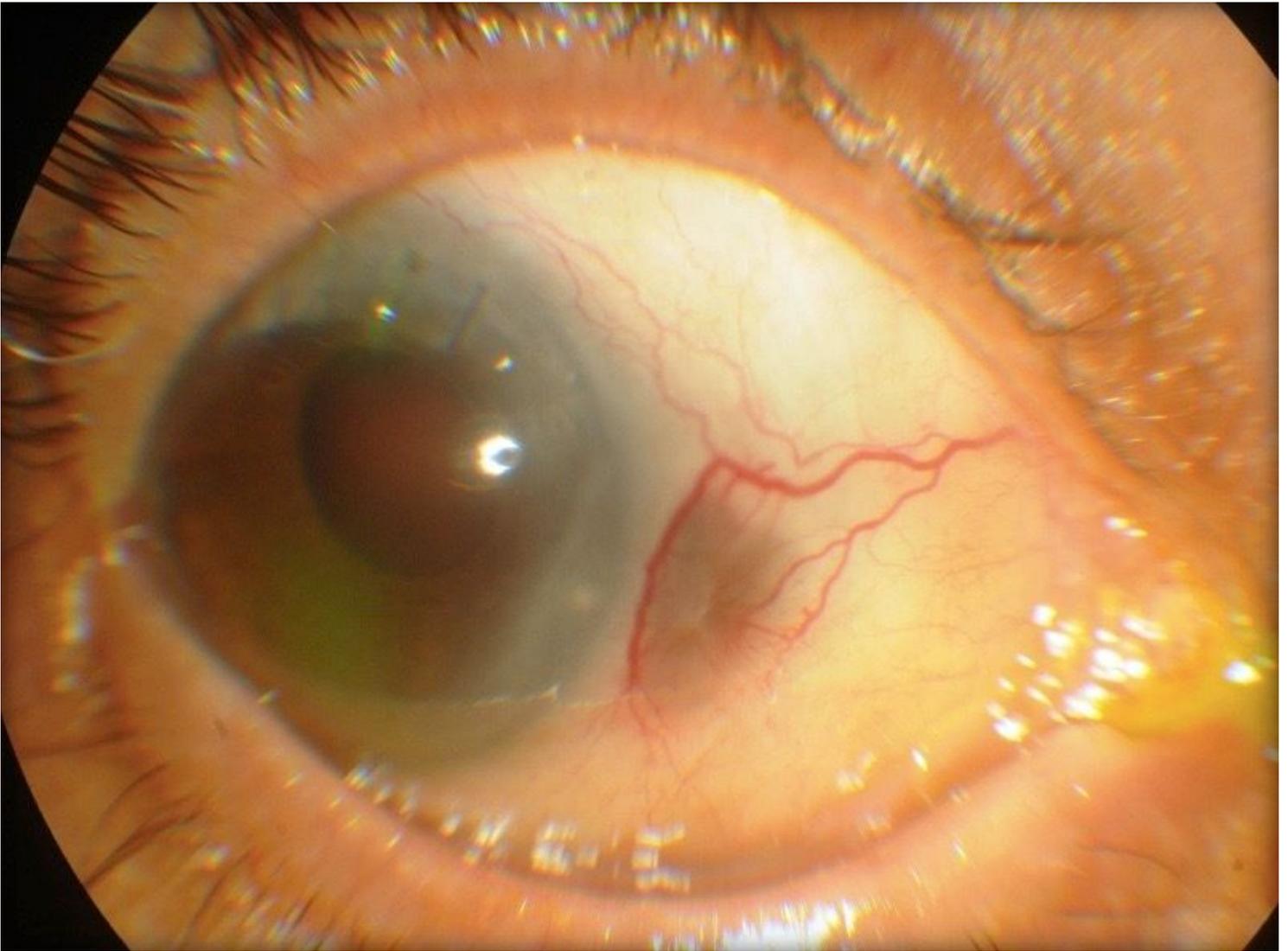
3. Chang V, Karp CL, Yoo SH et al. Mycobacterium abscessus Endophthalmitis After Descemet's Stripping With Automated Endothelial Keratoplasty. *Cornea* 2010;29. doi 1097/ICO.0b013e3181bd44b4
4. Bostan C, Slim E, Choremis J et al. Successful management of severe post-LASIK Mycobacterium abscessus keratitis with topical amikacin and linezolid, flap ablation, and topical corticosteroids. *Journal of Cataract and Refractive Surgery* 2019;45. doi 1016/j.jcrs.2019.03.001
5. Hsu C-R, Chen J-T, Yeh K-M et al. A cluster of nontuberculous mycobacterial endophthalmitis (NTME) cases after cataract surgery clinical features and treatment outcomes. *Eye* 2018;32. doi:10.1038/s41433-018-0108-1
6. Hung J-H, Huang Y-H, Chang T-C et al. A cluster of endophthalmitis caused by Mycobacterium abscessus after cataract surgery. *Journal of Microbiology, Immunology and Infection* 2016;49. doi 1016/j.jmii.2014.02.001
7. Paulose RM, Joseph J, Narayanan R et al. Clinical and microbiological profile of non-tuberculous mycobacterial endophthalmitis—experience in a tertiary eye care centre in Southern India. *Journal of Ophthalmic Inflammation and Infection* 2016;6. doi 1186/s12348-016-0096-x
8. Hung J-H, Ko W-C, Chen C-Y et al. Postoperative Mycobacteroides abscessus subsp. abscessus endophthalmitis Clinical analysis of 12 clustered adults and a proposed therapeutic algorithm. *Journal of Microbiology, Immunology and Infection* 2020;53. doi:10.1016/j.jmii.2018.12.011
9. Shah M, Relhan N, Kuriyan AE et al. Endophthalmitis Caused by Nontuberculous Mycobacterium Clinical, Features, Antimicrobial Susceptibilities, and Treatment Outcomes. *Am J Ophthalmol* 2016;168. doi:10.1016/j.ajo.2016.03.035
10. Stewart MW, Alvarez S, Ginsburg WW et al. Visual Recovery Following Mycobacterium chelonae Endophthalmitis. *Ocular Immunology and Inflammation* 2006;14. doi 1080/09273940600678062
11. Girgis DO, Karp CL, Miller D. Ocular infections caused by non-tuberculous mycobacteria update on epidemiology and management. *Clinical Experimental Ophthalmology* 2012;40. doi:10.1111/j.1442-9071.2011.02679.x
12. Chu H-S, Chang S-C, Shen EP et al. Nontuberculous Mycobacterial Ocular Infections—Comparing the Clinical and Microbiological Characteristics between Mycobacterium abscessus and Mycobacterium massiliense. *PLOS ONE* 2015;10. doi 1371/journal.pone.0116236
13. Brown-Elliott BA, Nash KA, Wallace RJ. Antimicrobial Susceptibility Testing, Drug Resistance Mechanisms, and Therapy of Infections with Nontuberculous Mycobacteria. *Clinical Microbiology Reviews* 2012;25. doi 1128/CMR.05030-11
14. Rolfe NE, Garcia C, Widen RH et al. Rapid diagnosis of Mycobacterium abscessus endophthalmitis. *Journal of Medical Microbiology* 2013;62. doi 1099/jmm.0.051771-0
15. Kheir WJ, Sheheitli H, Abdul Fattah M et al. Nontuberculous Mycobacterial Ocular Infections A Systematic Review of the Literature. *Biomed Res Int* 2015;2015. doi:10.1155/2015/164989

## Figures



**Figure 1**

Fundus fluorescein angiogram showed petaloid leakage at the macula and a hot-disc. She responded well to topical steroids, ceftazidime and vancomycin. In September 2017, she developed recurrent hypopyon uveitis with fluffy white material in AC, scleral abscess and marked vitritis (Figure 1).



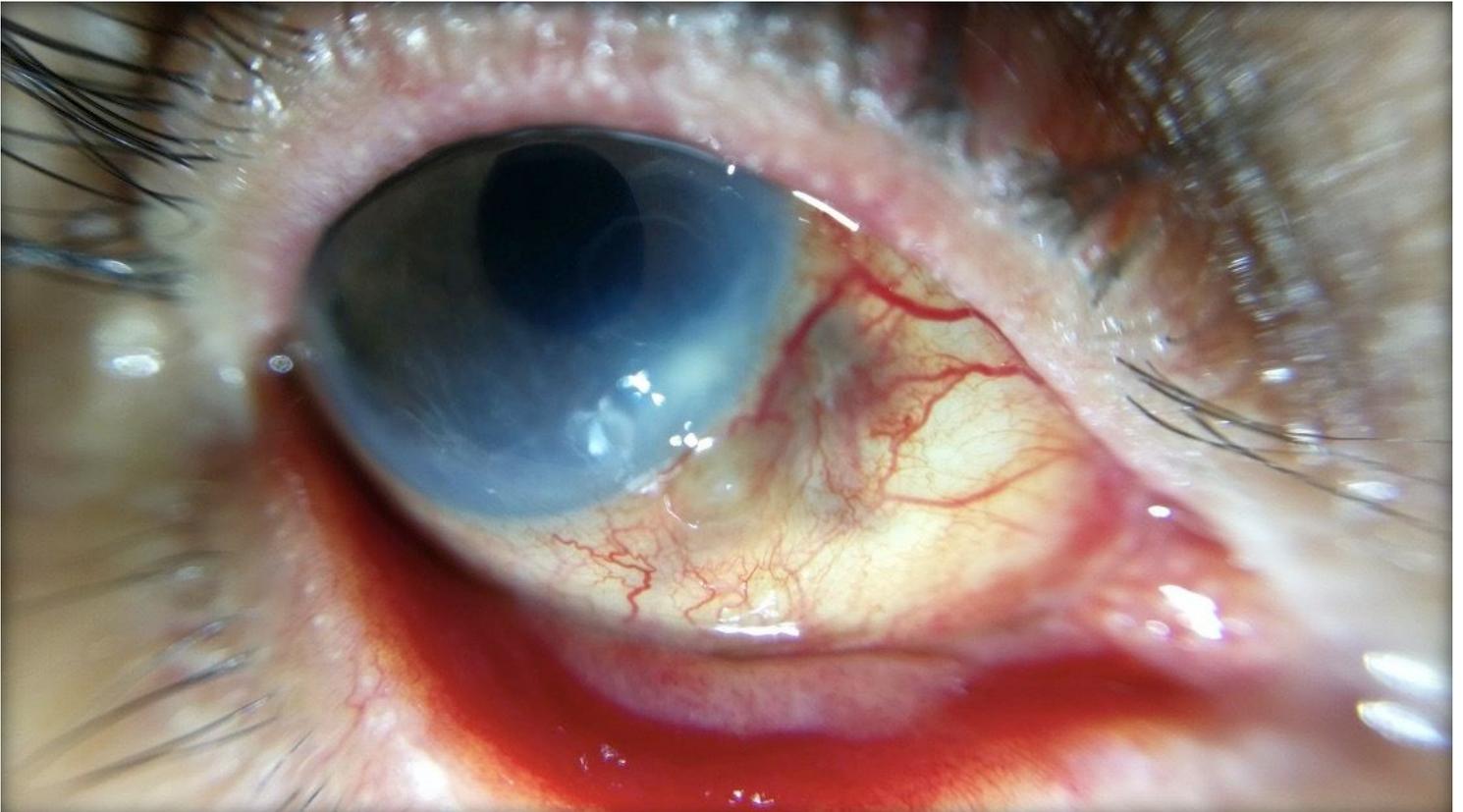
**Figure 2**

In November 2017, the eye remained quiescent, visual acuity of 1/60 (Figure 2). Intramuscular Streptomycin 1g three times per week for 2 months, oral Rifampicin 600 mg od and oral Clarithromycin 500mg od regime were continued for 9 months.



**Figure 3**

However in July 2018, she developed recurrent hypopyon uveitis, iris nodules, scleral nodule and vitritis (Figure 3). We repeated AC and intravitreal tap sending for acid fast bacilli, gram stain and culture.



## Figure 4

She has completed treatment with BCVA of hand movement (Figure D). RE was aphakic, anterior segment was quiet, optic disc was pallor, the vessels were attenuated and pigmentary changes at macular area. Her RE remain quiescent for 18 months since her last visit.