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# SUCCESSFUL TREATMENT OF EALES DISEASE WITH TUBERCULAR ETIOLOGY

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**ABSTRACT**

***Introduction:*** *Recurrent vitreous hemorrhage is a defining indication of Eales disease, an idiopathic occlusive vasculitis of the peripheral retinal veins that primarily affects young males, and 38.7% of patients had a history of tuberculosis. This case study aims to illustrate the effective treatment of Eales disease, which includes vitreous hemorrhage and associated tuberculosis.*

***Case report:*** *A 23-year-old male presented with the primary complaint of impaired vision in his left eye since two weeks ago. Visual acuity was 1/60, and ultrasonography revealed vitreous hemorrhage. The right eye also has a history of vitrectomy and silicon oil from a vitreous hemorrhage two months prior. A full work-up was completed, with positive interferon-gamma release assay (IGRA) results. The patient received a 6-month course of antituberculous medication and an oral steroid on a tapering dose. The vitrectomy procedure was conducted on the left eye, but vitreous hemorrhage persisted even after the surgery. Three months following surgery, the vitreous hemorrhage cleared, and the visual acuity improved to 6/6 with a negative IGRA result.*

***Discussion:****Eales disease is identified in the condition of occlusive periphlebitis and retinal neovascularization, especially in the peripheral retina, in one or both eyes, after excluding other causes. Some patients may experience floaters, impaired vision, or even decreased visual acuity due to massive vitreous hemorrhage. In the earliest days of retinal perivasculitis, most patients are asymptomatic. Anti-tuberculosis treatment is considered for Eales disease with acute retinal periphlebitis with extensive infiltration, nodule development, and venous segment disappearance. In cases with persistent vitreous hemorrhage with decreased central vision for 3 months, vitrectomy is an option.*

***Conclusion:*** *One of the features of Eales disease is a young adult with recurrent vitreous hemorrhage that is tuberculous in nature. Early identification and a thorough eye examination, including USG and IGRA testing, as well as appropriate medicinal and surgical care, will result in a positive outcome.*

**Keywords:** Eales disease, vitreous hemorrhage, vitrectomy, tuberculous-related, retinal vasculitis.
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## INTRODUCTION

Eales' disease refers to an idiopathic occlusive retinal vasculitis of the peripheral retinal veins, which typically affects young men, with the main sign being recurrent vitreous hemorrhage. Henry Eales first described this disease, where he found it in 7 men aged 14-29 years with recurrent retinal hemorrhages.[1,2] According to reports, the proportion of men with Eales' disease ranges between 71 and 100%, with a 72-90% prevalence of bilateral involvement.[3] This condition is more frequent in the Indian subcontinent, with an occurrence of one in every 200 to 250 eye disease patients..[1]

Signs and symptoms that can be found in Eales disease include vitreous hemorrhage (VH), peripheral capillary nonperfusion, periphlebitis with or without arteritis, disc neovascularization (NVD), , retinal neovascularization (NVE), central or branch retinal vein occlusion, tractional retinal detachment (TRD), a combination of TRD and rhegmatogenous retinal detachment (RRD).[1–4]

Patients generally present with repeated vitreous hemorrhages, which are bilateral. Some patients may lose eyesight as a result of recurrent vitreous haemorrhage, macular anomalies or tractional retinal detachment.[5–7] Although Eales disease is classified as idiopathic, 38.7% of patients may have Mycobacterium tuberculosis and a high sensitivity to tuberculosis antigens.[2,3,8,9]

Eales' disease has a highly varied natural course. Typically, the active perivasculitis stage is followed by an ischemic stage, retinal neovascularization, and recurrence of vitreous hemorrhage.[1,6,10] Corticosteroids are typically used to treat the inflammatory stage, photocoagulation in the proliferative stage, lastly vitreous surgery.[1,11,12] When treated early in the disease's progression, the visual prognosis isusually favourable. In one study, only 6.17% of eyes had vision <20/200, while 54.5% of eyes had visual acuity reaching 20/40.[3,13]

This case report documented Eales' disease. It is hoped that reading this case report can broaden insight and increase awareness in diagnosing and managing Eales' disease.

## CASE REPORT

A male patient, aged 23 years, came to the Saiful Anwar Hospital with the main complaint that his left eye vision had been blurry since 2 weeks ago, suddenly**.** The patient did not complain of pain, watery eyes, or eye discharge. There was a history of vitrectomy + silicone oil tamponade due to vitreous hemorrhage + tractional retinal detachment on the right eye 2 months ago in another hospital. He also had a history of tuberculosis and had been undergoing treatment for one month. In the history of therapy, the patient had received tranexamic acid 3x500mg, methylprednisolone 16mg, potassium iodine combined sodium iodine eye drop 4x1 drops for both right and left eyes from an ophthalmologist. The patient never had a nosebleed or bleeding gums. The complaint of dizziness was denied. The patient had no history of previous use of glasses. The history of diabetes mellitus and hypertension was denied.

On examination of the ophthalmological status, the visual acuity in the right eye was 1/300, and the left eye was 1/60. The anterior segments of both eyes were within normal limits. On examination of the anterior segment of the right eye, grade I media opacity was found, with the optic nerve papillae within normal limits.

Perivascular sheathing was found, and the retina was attached with silicon oil. Funduscopic examination of the left eye revealed grade I media opacity due to vitreous hemorrhage, and hemorrhages were found in the papillae and retina.

On ultrasound examination, echodence was found in the anterior, middle, and posterior vitreous with medium-high spikes and a continuous line appearance with attachment to the papillae, suggesting vitreous hemorrhage and retinal detachment.

Laboratory examination showed positive IGRA results, while other blood and immunological parameters were within normal limits.

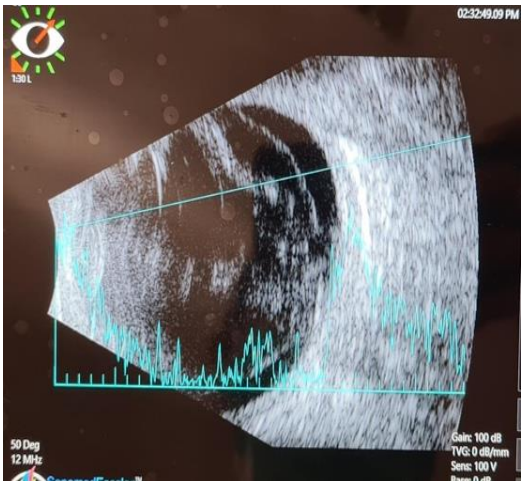


Figure 1. **The ultrasound of the left eye. Vitreous opacity with continuous lines.**

The patient was diagnosed with OD Attached Retina Post Pars Plana Vitrectomy, OS vitreous haemorrhage + suspected retinal detachment + Eales disease. He was planned for OS pars plana vitrectomy + endolaser + silicone oil/GA.

On March 3, 2021, OS pars plana vitrectomy + membrane peeling + endolaser was performed. Intraoperatively, apart from a vitreous haemorrhage, perivascular sheathing in the superior to temporal areas, ghost vessels and neovascularization of the retina were also found. Postoperative therapy was ciprofloxacin 2x500mg, paracetamol 3x500mg, eyedrops levocin 6x1 OS, vosama 6x1 OS, and homatro 2% 3x1 OS. The follow-up day+1 of the operation showed visual acuity in the left eye of 1/300, subconjunctival haemorrhage, and hyphema in the anterior chamber. Media opacity grade III e.c. vitreous haemorrhage was found on fundoscopy of the left eye, with details that were difficult to evaluate. Fundoscopy of the right eye showed haemorrhage, exudate, post-laser scar and re-detachment of the inferior retina. Postoperative therapy was continued, and the patient was sent home.

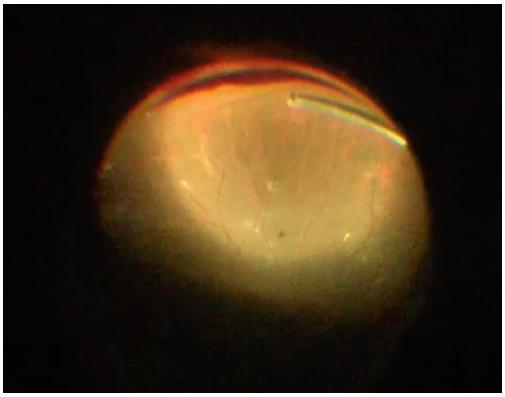

Figure 2. **Intraoperative findings of the left eye. There was perivascular sheathing and neovascularization of blood vessels.**

At the visit 2 weeks after surgery, visual acuity in both eyes remained. In the anterior segment, there was a posterior subcapsular cataract in the lens of the right eye.

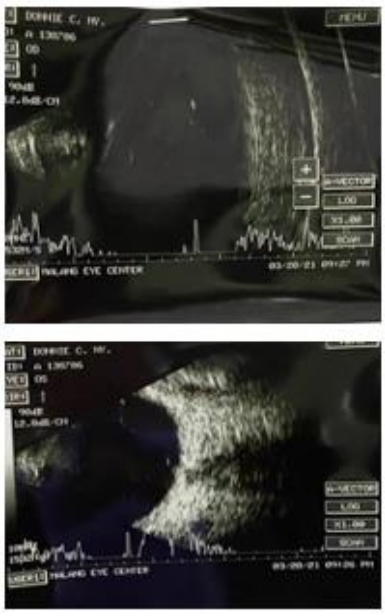

Figure 3. **Postoperative ultrasound. There was still opacity in the vitreous part of the left eye.**

On posterior segment examination, the left eye was difficult to evaluate, and the right eye showed perivascular sheathing in the temporal and inferior areas and recurrent retinal detachment in the inferior area.

Tapering off the dose for Vosama eyedrop was carried out. Homatro eyedrop was continued, accompanied by the administration of vitrolenta eyedrop and education to semi-fowler bed rest.

A month after surgery, the patient's left eye's visual acuity improved to 6/15f. In the anterior segment, a grade III cell was found in the anterior chamber, and the intraocular pressure was 23 mmHg. From the result of the evaluation of the posterior segment of the left eye, grade III opacity was still found. Post-laser scar was visible in the superior and temporal areas. Fluorometholone and thymol were added to the therapy.

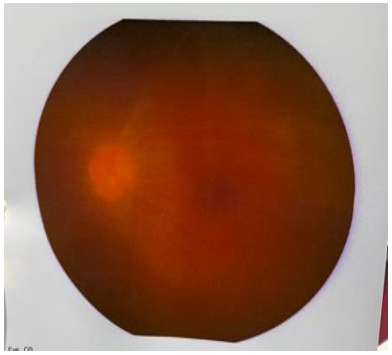

Figure 5. **A fundus photo of the left eye showed the presence of vitreous opacity with details that could not yet be evaluated.**

Three months after surgery on the left eye, the visual acuity in the right eye remained 1/60, and the visual acuity in the left eye remained 6/6. The anterior segments of both eyes were quiet, with a posterior subcapsular cataract in the right eye. The intraocular pressure in the right eye was 23 mmHg, and the left eye was 12 mmHg. The posterior segment of the right eye showed a reattached retina. Post-laser scar and epiretinal membrane were found on both eyes. The patient was only given 0.5% thymol and was planned to undergo silicon oil evacuation and cataract extraction for the right eye.

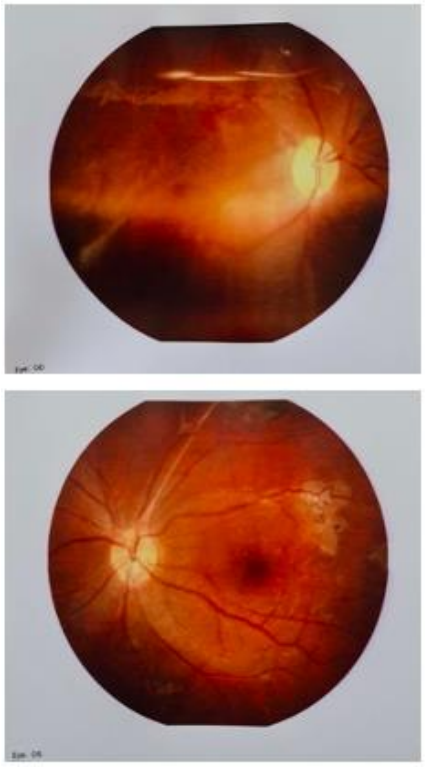

Figure 7. **Fundus photo in 3 months postoperatively. The epiretinal membrane was visible in both eyes.**

## DISCUSSION

Eales disease is diagnosed in the presence of occlusive periphlebitis and retinal neovascularization, especially in the peripheral retina, in one or both eyes after excluding other causes such as diabetic retinopathy, hypertensive retinopathy, non-inflammatory retinal vein occlusion, sickle cell anaemia, infection or inflammation such as collagen tissue disease, Behçet's disease, sarcoidosis, and syphilis. Eales disease most often occurs in healthy young adults and is dominated by men (97.6%).[1–4]

Three basic pathological changes cause the clinical manifestations of this disease. Initially, patients present with retinal perivasculitis, especially in the peripheral retina or inflammatory stage. During the inflammatory stage, retinal vein sclerosis occurs. Then, retinal vein sclerosis will cause ischemia and, finally, the proliferative stage, namely neovascularization of the retina or optic disc, recurrent vitreous haemorrhage with or without retinal detachment. Vision loss is usually

caused by bilateral recurrent vitreous haemorrhages and sequelae of the disease.[1,2,6]

Some patients may experience symptoms such as floaters, blurred vision, or even decreased visual acuity due to massive vitreous haemorrhage. Symptoms of black spots or floaters were found in 75% of patients, and 60% experienced decreased vision without pain. The patient's visual acuity can be normal to just a wave of the hand or perception of light, and bilateral conditions are quite common (50-90%).[5–7]

In this case report, the patient was a young adult, 23 years old, who had previously complained of floaters and experienced a sharp decrease in vision, which turned out to be a vitreous haemorrhage and recurred. It is in accordance with the characteristics of Eales disease. Patients are often asymptomatic in the early stages of retinal perivasculitis. Usually, in active perivasculitis, there is exudate around the retinal veins and involves one or more quadrants. Healing perivasculitis often presents as sheathing veins. Other vascular changes include venous sclerosis, irregularity of venous calibre, venous pigmentation, tortuous veins, abnormal vascular anastomoses, and veins pulled into the vitreous cavity.[1,3–5] Ophthalmological examination in this patient revealed perivasculitis in the fellow eye at the beginning of arrival, namely the presence of perivascular sheathing and the presence of exudate around the blood vessels. Macular changes are relatively rare. The most commonly seen macular change is macular oedema. Other changes include exudate in the macula and epimacular membrane.[1,2,10] In this case report, exudation was seen around the macula. Peripheral retinal neovascularization is quite common in Eales disease and is reported in 36-84% of cases. Optic disc neovascularization is rare in approximately 9% of cases.[2,3,11,12] In this case report, neovascularization was found in the retina and disc in the patient.

Recurrent vitreous haemorrhage is a feature of this disease. Fundus details can't be evaluated in the affected eyes because of vitreous haemorrhage in 36.9% of patients.[4,12] The cause of vitreous haemorrhage in these eyes is often haemorrhage from the retina or disc neovascularization. Still, it can also occur due to the rupture of capillaries or large veins during the active inflammation stage.[1,2] The patient, in this case, experienced recurrent eye bleeding in both eyes. It was preceded by the right eye and then the left eye before and after surgery.

In eyes with media opacification, ultrasonography (USG) is needed to evaluate the presence of retinal detachment, whether tractional, rhegmatogenous, or combined, and is an indication for vitreous surgery. Echo density depends on the density of the vitreous haemorrhage. Vitreous haemorrhage often resolves spontaneously within 4-8 weeks. Vitreous haemorrhage is also quite often persistent or does not go away and is organized with multiple vitreoretinal adhesions, which can cause tractional retinal detachment. New blood vessels can also spontaneously regress and be replaced by glial tissue.[1,7,8]

The etiology of Eales' disease remains controversial and, to date, poorly understood. The etiology is stated to be multifactorial. Eales' disease is thought to be an immunological reaction in response to an exogenous agent. No specific cause has been described to date, and the disease is still considered largely idiopathic. Exposure to tuberculosis and hypersensitivity to tuberculoprotein are thought to be associated with this disease.[1,2,8,9] The association between Eales' disease and tuberculosis has been described in several studies. A prospective case-control study was performed on 65 patients (31 with Eales disease and 34 controls). Patients with macular oedema, neovascular proliferation, proliferative diabetic retinopathy, tractional retinal detachment, and premacular fibrosis were taken as control patients. Polymerase chain reaction (PCR) was used

to detect the M. tuberculosis MPT64 gene in patients with Eales' disease. Polymerase chain reaction (PCR) results were compared using the patient's clinical symptoms, erythrocyte sedimentation rate (ESR), and tuberculin skin test (TST) values. In patients with Eales' disease, PCR positivity was 38.7%. There was strong evidence between positive PCR and high TST and ESR values.[8] Another study reported the presence of Mycobacteria in the vitreous humour of patients who had Eales' disease. Eighty-eight patients were enrolled in the study and divided into 3 separate groups: Group A had 28 patients who had Eales disease, Group B had 30 control patients who had specific uveitis syndrome, and Group C had 30 negative control patients. The PCR test was carried out on vitreous humour samples to detect the M. tuberculosis (MTB) MPB64 gene. 57.14% of vitreous humour samples in group A, 1 sample in group B, and no sample in group C tested positive for the Mycobacterium tuberculosis genome.[9] The role of the Mycobacterium tuberculosis genome in the pathogenesis of Eales disease has not been determined. In this case report, the result of IGRA was positive, while other laboratory results were within normal limits. The patient was given anti-tuberculosis therapy and still took medication during the treatment period.

Anti-tuberculosis treatment is considered for Eales disease with acute retinal periphlebitis with massive infiltration, nodule formation, and obliteration of venous segments. In patients with a positive Mantoux test and active perivasculitis, some researchers recommend treatment with a combination of oral corticosteroids and anti-TB therapy.[1,2,6,12]

In cases with persistent vitreous haemorrhage with decreased central vision for 3 months, vitrectomy can be performed. The goal of vitreous surgery is to clear vitreous opacities and also to evaluate the fundus. Laser photocoagulation can be performed at the same time as vitrectomy. The laser can be done with endophotocoagulation or indirect laser. Vitrectomy is required in 6-18% of eyes with Eales disease.[3,13–15] In this patient, a vitrectomy was performed in both eyes due to unrelieved bleeding and decreased visual acuity, but in the patient's right eye, the retinal detachment occurred again after the vitrectomy. Endolaser was also performed simultaneously during surgery on this patient.

The visual outcome after vitrectomy in Eales' disease is generally good. Visual improvement is seen in 77-88.6% of patients after vitrectomy in Eales' disease. In long-term evaluation, improved or better visual acuity is seen in 65.5% of patients.[12–14] Improvement in visual acuity in the left eye of the patient in this case report occurred 1 month after vitreous haemorrhage that occurred postoperatively. The patient's vision improved from 1/60 to 6/15f and in the third month to 6/6.

## CONCLUSION

Young adult presented with reccurent vitreous haemorrhage and tuberculous related is one of Eales disease characteristics. Early detection and comprehensive eye examination, including USG and IGRA test, as well as appropriate medical and surgical management, will give a successful outcome.

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