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Chorioretinitis with retinal ablation complications in patients with cytomegalovirus infections and high myopia: a case report



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ABSTRACT

Background: Chorioretinitis is uveitis that causes choroidal and retinal inflammation. Chorioretinitis in general due to cytomegalovirus (CMV) infection has been recognized as a major cause of congenital virus infections. A common complication in patients with uveitis is retinal detachment. In addition, high myopia can also cause retinal detachment.

Case Illustration: We reported a 33-year-old male patient who came with chief complaints of a sudden blurred left eye the couple of weeks before admission. The patient had a history of high myopia -5D in both eyes and was HIV positive. One week before the complaint, patient underwent laser therapy because of retinal detachment and was also given Neomicin and Potassium Iodide eye drops. Patients presented with vision 1/60. In funduscopy examination, we found vasculitis, retinal detachment, bleeding and exudate. The patient was then diagnosed with OS

Rhegmatogenous Retinal Detachment (RRD) caused by CMV chorioretinitis and high myopia ODS. The patient was treated with valganciclovir 1x900mg, methylprednisolone 2x32mg, prednisone eye drops 6x1 OD and underwent pars plana vitrectomy (VPP). The patient had complicated cataracts, therefore phacoemulsification, evacuation and reinjection of silicon oil and endolaser were performed. Unfortunately, the results obtained are not optimal where the patient's vision becomes the patient's no light perception (NLP).

Discussion: Retinal detachment is a frequent complication in patients with CMV chorioretinitis. The main therapy is HAART, anti-CMV and operative management. This therapy regimen is proven to improve overall patients' prognosis.

Conclusion: Early diagnosis and appropriate treatment have a very important role in determining the prognosis of patients with CMV chorioretinitis.

Keywords: Chorioretinitis, cytomegalovirus, retinal detachment, high myopia.

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INTRODUCTION

Chorioretinitis is a type of uveitis that involves inflammation of the choroid and retina. Although the term uveitis is defined as inflammation of the uveal tract (iris, ciliary body, and choroid), it can also involve other structures such as the retina, retinal blood vessels, vitreous, optic nerve and sclera. Chorioretinitis is a type of posterior uveitis. Because the choroid is responsible for supporting the blood vessels of the outer layer of the retina, inflammation in this layer can cause vision-threatening complications.¹

Chorioretinitis generally occurs as a result of an infection. Cytomegalovirus (CMV) has been identified as a major cause

of congenital viral infection.^{1,2} The patient population with an increased incidence of primary infection consists of infants who are still breastfeeding, children and health workers, and adults who are sexually active. CMV infection is generally asymptomatic in immunocompetent individuals, but can cause a heterophile negative mononucleosis syndrome in about 10% of primary infections in children and adults. Seroprevalence of CMV reflects geographic and racial variation, and tends to be highest in South America, Africa and Asia, and lowest in Western Europe and the United States. Seroprevalence is higher in non-whites and individuals of lower economic status.^{2,3}

CMV retinitis presents with

severe symptoms in severely immunocompromised AIDS patients, with CD4 lymphocyte counts less than 50 cells/ml. CMV can cause necrotic retinitis, retinal vasculitis, and optic neuropathy, with minimal vitritis. A characteristic feature of the fundus is a bleeding white retinitis lesion called a "pizza-pie" image.¹

Retinal detachment is a common complication in patients with uveitis. Traction retinal detachment often occurs as a complication of vitritis or scar chorioretinitis with retinal traction. CMV is a common cause of rhegmatogenous retinal detachment. In the AIDS era, one-third of patients with CMV retinitis had a rhegmatogenous retinal detachment.⁴ Retinal detachment

occurs when the neurosensory in the retina separates from the underlying retinal pigment epithelium.³ We report a case of chorioretinitis complicating retinal detachment in a patient with CMV infection and high myopia.

CASE ILLUSTRATION

A 33-year-old male patient came to Sanglah General Hospital with the main complaint that his left eye was suddenly blurred like a curtain and moved when the patient glanced at it since couple of weeks ago. Other complaints such as red eyes, career, pain in the eyeball were denied. The patient also had no history of trauma and previous eye surgery. About one week earlier, patient did laser therapy due to a tear in the retina. He has also given Neomicin and Potassium Iodide eye drops. Since high school, the patient had a history of wearing glasses with -5D in both eyes and was declared HIV positive since last year but did not receive any treatment.

On physical examination, it was found that his right eye vision (OD) was 1/60 with a pinhole (PH) of 6/60 and with glasses -5D 6/7.5 while his left eye vision (OS) was 1/60 PH. 5/60 and with glasses -5D 5/60. Examination of the anterior segment of the patient's eye was normal. On fundus examination, OD II nerve papules were round, well-defined, cup disk ratio (CDR) 0.4; 2/3 ratio of arterial and venous (aa/vv), vasculitis (+), retinal thigroid (+) and macular reflex (+). Whereas on his OS, the second nerve papillary was round, well-defined with CDR difficult to evaluate, aa/vv 2/3, vasculitis (+), superior and inferior (+) retinal detachment, break (-), bleeding (-), exudate (+), the macular reflex (+). The intraocular pressure is OD 15 mmHg and OS 8 mmHg (Figure 1). On eye ultrasound examination, the OD was normal and the OS had retinal detachment. Therefore, he was diagnosed with OS Rhegmatogenous Retinal Detachment (RRD) and CMV chorioretinitis and high ODS myopia. He was planned to undergo pars plana vitrectomy (VPP), scleral buckle (SB) and gas/silicon oil (SO) injection. He was also treated with prednisone eye drops 6x1 OS (Figure 2).

He was subjected to VDRL and TPHA examinations, both of which were non-reactive. The examination of the



Figure 1. A (1)Retina tigroid OD (2) Vasculitis (+), bleeding (+),exudate (+) OS, Fundus photography on 21st January 2019.

B (1) Tigroid Retina OD(2) Ablasio retina total OS, Fundus photography on 11st March 2019.

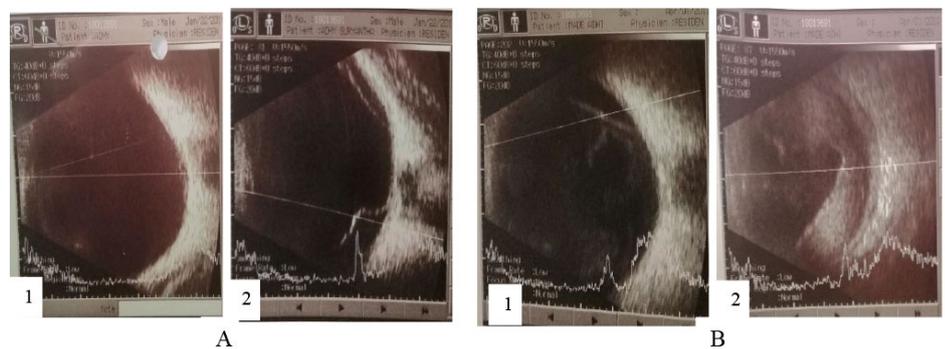


Figure 2. A (1) Normal OD (2) Ablasio Retina OS, ultrasound on, 21st January 2019.

B (1) Ablasio Retina OD (2) Ablatio Retina OS. ultrasound on 1st April 2019.

patient's CD4 level was only 15 cells/MCL and the CD8 level was 797 cells/MCL therefore his CD4: CD8 ratio was 0.02. Two months later, he was then started the treatment of Valgancyclovir 2x900mg and Lyteers eye drops 6x1 ODS. He also received treatment of antiretroviral FDC 1x1 and Clotrimazole 1x960mg from the internist. His CD4 and CD8 examination were 98 cells / MCL and 587 cells / MCL, respectively.

A couple of weeks later, his right eye vision worsened to 1/300 therefore, Valgancyclovir therapy was continued and 2x32 mg of Methylprednisolone was also added. The following month, his vision became 1/60 but his pinhole examination was not progressing, he was then planned to undergo VPP in six months because we were waiting until his CD4 reached above 150 cells / MCL. Nepafenac 0.1% eye drops 2x1 OD and potassium and sodium iodide eye drops 4x1 OD were added. However, the patient's vision deteriorated to no light perception (NLP) in the next month.

Six months later, he underwent VPP

(core vitrectomy) + ED (ξ 895, power 200, interval 200) + MP + silicon oil 1300 6cc. After surgery, he was given 2x500mg ciprofloxacin, 3x500mg paracetamol, 6x1 OD Levofloxacin eye drops, 0.5% Timolol eye drops 2x1 OD and Prednisone acetate eye drops 6x1 OD. Four months later, he had complicated cataracts, therefore he underwent SO evacuation, endolaser, SO 1,300 re-injection with MAC and IOL phacoemulsification. After surgery, he was treated with Levofloxacin eye drops 6x1 OD, Prednisone acetate eye drops 6x1. OD, Ciprofloxacin 2x500mg tablets, Paracetamol 3x500mg tablets and Lyteers eye drops 6x1 OD. ARV therapy was started the following month. Unfortunately, after surgery and therapy, the patient's clinical experience had not improved significantly, where the patient's vision was still NLP with intraocular pressure (IOP) 1.3.

DISCUSSION

The course of chorioretinitis complicated by retinal detachment begins with

hematogenous spread of the infection. Purulent endogenous chorioretinitis caused by hematogenous spread of microorganisms from distant focal infections. The course of purulent chorioretinitis varies depending on bacterial count, toxicity, and the overall and local immunity capacity of the organism and whether therapy has been effectively administered. Lesions are generally limited to mild cases, whereas vitreous abscesses will appear almost immediately in severe cases.⁵

Most endogenous purulent chorioretinitis begins at the posterior pole. A well-defined exudative lesion can be seen at an early stage by ophthalmoscopy. There are bleeding points of different sizes, exudates, and radial creases on the surface and/or in the surrounding area. The retinal vessels may be dilated and some of them become clouded with edema and exudate. Vision is very disturbed later in life, even to the point of only light perception. The inflammation then spreads to the vitreous and develops into vitreous cysts and retinal detachment, when the number of bacteria and virulence is very large and strong, while immunity is weak.⁵

Eye involvement is a complication of viremia in which virus (or viral DNA) can be found in tears and the aqueous humor. Clinically, the initial lesion has a characteristic clinical appearance with an area of necrosis in the form of an opaque punctate clearly visible on the retina on examination using an ophthalmoscope. Retinal changes develop like a “brushfire” over several months with blood vessels coated with exudate and bleeding are common characteristics. Small retinal vascular aneurysms may occasionally appear and retinal detachment is a common complication seen in severe cases. CMV retinitis is a lesion in severe immunosuppression, which appears when the CD4 + T cell count is ≤ 50 / mm³. The clinical symptoms of these lesions are often difficult to distinguish from toxoplasmosis chorioretinitis and varicella panophthalmitis. Blood vessels describe various characteristics, vasculitis and thrombosis have been described in some cases with involvement of endothelial cells by CMV.⁶

CMV retinitis can be categorized as fulminant with a large hemorrhagic area and a retina that is white, edematous or necrotic (known as a “pizza pie”) or granular, where slow progression presents with more peripheral lesions with minimal edema, exudate or bleeding. Another subtype is known as frosted branch angitis with a significant perivascular lining. CMV is also classified according to the area of involvement: zone 1 is within 1500 mm of the optic nerve or 3000 mm from the fovea; zone 2 extends from zone 1 to the equator; and zone 3 is the remnant of the anterior retina, ending in the ora serrata.⁷

One of the complications in patients with chorioretinitis is retinal detachment, wherein rhegmatogenous retinal detachment or rhegmatogenous retinal detachment (RRD) occurs in one-third of patients with CMV chorioretinitis. In addition, postoperative visual improvement in patients with RRD due to uveitis was worse than in patients without uveitis. The causes of bilateral RRD in patients with viral uveitis are the presence of retinal necrosis and atrophy, vitreous degeneration, fibrosis and traction.⁴ In this case, patient also had high myopia whereas myopia itself could lead to retinal detachment. It is well known that the incidence of retinal detachment in patients with myopia was higher than in patients with emetropia, namely 3.2% versus 0.71%. The risk of experiencing retinal detachment increases with increasing diopters wherein patients with myopia $< -4.75D$ the incidence rate of retinal detachment is 0.015%; 0.07% in patients with $-5.00D$ to $-9.75D$; and 0.075% in patients with $> -10.00D$.⁸ In this case, two things can cause retinal detachment: chorioretinitis due to CMV infection and high myopia. Given the incidence of retinal detachment based on the degree of myopia as described above, in this case, retinal detachment tends to be caused by chorioretinitis, a study conducted by the Longitudinal Study of Ocular Complication of AIDS (LSOCA) found that CD4 levels below 50 cells / mL were a risk factor. The strongest occurrence of CMV retinitis is that one-third of patients with CMV retinitis will experience retinal detachment.⁹

The goals of anti-CMV therapy are to maintain visual function and reduce the risk of developing visual complications associated with CMV. The essence of long-term control of CMV retinitis is immune reconstitution with highly active antiretroviral therapy (HAART). Retinal detachment is a significant cause of visual loss in patients with CMV chorioretinitis with an incidence of 33% per eye per year before the introduction of HAART. HAART significantly reduced the risk of retinal detachment to 1.0-8.7 / 100 patients. However, if retinal detachment has occurred, the patient's outcome will be the same in the pre-HAART era and after HAART.¹⁰ For AIDS-induced CMV retinitis, the CDC recommends long-term HAART therapy for a lifetime or until immune reconstitution, i.e. CD4 levels $> 100-150$ cells / mL for > 6 months.¹¹

In addition, the first therapy to be shown to be effective in treating CMV retinitis was ganciclovir. In this case, the patient was treated with valganciclovir, a prodrug of ganciclovir with the bioavailability and effectiveness of oral valganciclovir similar to intravenous ganciclovir where a dose of 900 mg of valganciclovir once daily equals a dose of 5 mg/kg intravenous ganciclovir. Valganciclovir compared to other therapies is considered more straightforward and more accessible, thereby increasing patient adherence rates. In addition, valganciclovir is less expensive than other therapeutic regimens. This therapy should be started as soon as possible and given up to 6 months after retinitis inactivity or a CD4 count > 100 cells / mL.¹²

In patients with retinal detachment due to CMV retinitis operative management is important to maintain visual function and improve the patient's quality of life. Operative management such as laser retinoplexy, scleral buckle (SB), vitrectomy with silicone oil (SO) or a combination of these is used to prevent posterior progression. However, vitrectomy and SO injection are more advantageous than SB. Pneumatic retinoplexy or a combination of vitrectomy and fluid gas exchange where anatomical and functional success can reach 73.7% and 52.6%, respectively. However, there are no studies that describe the appropriate time for operative management.¹³

Additional therapy given in this case was Nepafenac eye drops containing Nepafenac where the patient's vision improved after administration of Nepafenac eye drops. Nepafenac is a topical non-steroidal anti-inflammatory drug (NSAID) that is the standard pre-operative therapy. Research shows that nepafenac with its anti-inflammatory role can reduce macular edema and inflammation so that it can improve the patient's vision.¹⁴ In this case, the patient was suspected of having immune recovery uveitis (IRU) due to an improvement in the patient's CD4 level where IRU itself could cause macular edema.

Although with the development of HAART therapy there was a decrease in the incidence of retinitis from 30% to 22%, 10-20% of patients with HIV / AIDS still experience blindness due to retinitis.¹⁵ Patients with CMV retinitis who experience immune improvement have a better prognosis with a survival rate of 27 years and the 10-year survival rate was 75% after diagnosis of CMV retinitis. This is very different from patients who do not experience immune improvement where the survival rate is only one year and the survival rate in 5 years is only 10%. Patients with a CD4 cell count > 200 cells / mL had the lowest mortality rate. In the era of HAART and anti-CMV therapy, there was a significant improvement in visual prognosis where the cumulative incidence of bilateral visual disturbances and blindness after diagnosis of CMV retinitis was 9.5% and 3.2%. This figure is not affected by the patient's immunity, so anti-CMV therapy is thought to play an important role. In patients with CMV retinitis, visual acuity may be reduced due to damage to the macula or optic nerve from the infection itself, retinal detachment and cataracts. Meanwhile, in HIV / AIDS patients who experience immune repair, impaired visual acuity can be caused by macular edema due to immune recovery uveitis. The incidence of blindness in patients with CMV retinitis is lower in patients with immune repair. Administration of anti-CMV therapy can reduce mortality by 50%, reduce involvement of the second eye by 80%

and reduce involvement of other visceral organs by 90%.¹⁶

CONCLUSION

CMV chorioretinitis is an opportunistic infection that occurs in patients with HIV / AIDS where complications such as retinal detachment can reduce the patient's survival rate and patient's quality of life so that early diagnosis and appropriate treatment have a very important role in determining the patient's prognosis.

CONFLICT OF INTEREST

All author declares there is no conflict of interest regarding publication of this article.

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ETHICAL STATEMENT

Signed written informed consent has been received from patients regarding publication of their respective medical data in scientific medical journal articles, with strict confidentiality regarding personal identity and information.

AUTHOR CONTRIBUTION

All authors had contributed I manuscript writing and agreed to the final version of the case report for publication.

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