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Case Report : Management of Post Operative Endophthalmitis with Diabetic Patient

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Management of Post Operative Endophthalmitis with Diabetic Patient

Abstract

Introduction:

Endophthalmitis. is a severe, purulent intraocular inflammation of the eye that is threatening the vision. The most of post operative endophthalmitis occur after ocular surgery. Diabetic patient with uncontrolled blood glucose have higher infection risk and slower wound recovery. Without proper and timely treatment, the infection results in loss of vision and commonly loss of the eye.

Purpose :

To report a case of post operative endophthalmitis with Diabetic patient

Case report :

A sixty four years old man came to emergency department with chief complaints blur, pain and redness on his right eye since ten days ago. He underwent cataract surgery on right eye three weeks ago in Cianjur District General Hospital. The visual acuity of the right eye was hand movement. Ophthalmological examination of the right eye. was blepharospasm on palpebra, ciliary injection on conjunctiva, edema with descemet fold on cornea. Anterior chamber was van herick grade III, with flare/cell +4/+4, and hypopion 0,5 mm. There were irregularly pupil and posterior synechia. The light reflex was decreased because of synechia. The intraocular lens was captured with pupil. Posterior segment was hazy media. Ultrasound examination showed vitreous cavity was echogenic with obscured, low to medium reflectivity, medium to high mobility and double layered appearance.

Conclusion :

Management of post operative endophthalmitis with complete and early vitrectomy with intravitreal antibiotics and dexamethasone intravitreal give a good result. Antibiotics and anti-inflammatory systemic therapy, and also blood glucose control play a role to resolve the infection.

I. INTRODUCTION

Endophthalmitis. is a severe, purulent intraocular inflammation of the eye involving both anterior and posterior chamber, except the sclera. It is attributable to bacterial or fungal infection. Endophthalmitis can caused by several things, such as endophthalmitis following open globe injury, endogenous endophthalmitis, and also endophthalmitis after ocular surgery. More than 70% of cases of endophthalmitis occur following eye surgery.¹⁻⁵

Despite the advance in surgical techniques, the use of antibiotics and the improvement in surgical environment, endophthalmitis still occurs after different types of ocular surgery at different rates worldwide.^{1,2}

Most of the post operative endophthalmitis occur after ocular surgery. The incidence of postoperative endophthalmitis is ranging from 0,07% to 0,40%. . Gram-positive bacteria are the most commonly reported etiologic agent for post operative endophthalmitis including coagulase negative and coagulase positive staphylococcus, streptococcus species

and enterococcus. Gram-negative bacteria are less reported in post operative endophthalmitis. Gram-positive coagulase negative organisms have greater growth inside eyes of diabetic patients as compared to nondiabetic patients. It is about 58,6% in diabetic patient, and 45,0% in nondiabetic patients. Diabetic patient with uncontrolled blood glucose have higher infection risk and slower wound recovery.³⁻⁵

Without proper and timely treatment, the infection results in loss of vision and commonly loss of the eye. It is necessary to recognize the condition early, and decide to type of therapy. This case report presents the management of post operative endophthalmitis with diabetic patient.¹⁻⁴

II. CASE REPORT

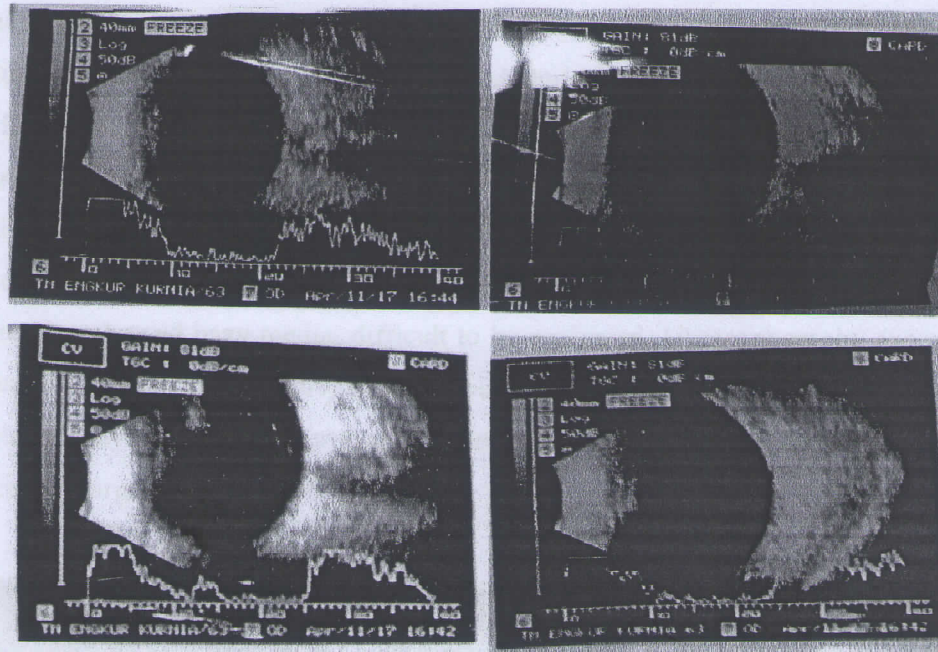
Sixty four years old man came to emergency department with chief complaints blur, pain and redness on his right eye since ten days ago. He underwent cataract surgery on right eye three weeks ago in Cianjur District General Hospital. After operation, visual acuity on right eye is better than before. Two months ago, he underwent cataract surgery on his left eye. He has Diabetes Mellitus since 16 years ago and got therapy Novorapid 3x10 unit and Levemir 16 unit. He has hypertension and he forgot the name of medicine. He has no history of allergy nor asthma.

On general physical examination, consciousness was fully alert, blood pressure was 167/93, heart pulse 85x/minute, respiratory rate 20x/minute, and temperature was 36,5 °C. Visual acuity on right eye was hand movement. Visual acuity on left eye was 0,16 pinhole 0,25. Intraocular pressure was 11 on right eye and 15 on left eye. Eye movements were good to all directions.



Picture 2.1 Anterior Segment of Right Eye on 11th April 2017

Anterior segment on her right eye was blepharospasm on palpebra, ciliary injection on conjunctiva, edema with descemet fold on cornea. Anterior chamber was van herrick grade III, with flare/cell +4/+4, and hypopion 0,5 mm. There were irregularly pupil and posterior synechia. The light reflex was decreased because of synechia. The intraocular lens was captured with pupil. Anterior segment on her left eye was within normal limit with intraocular lens and posterior capsular opacity grade III.



Picture 2.2 Ultrasonography of right eye on 11th April 2017

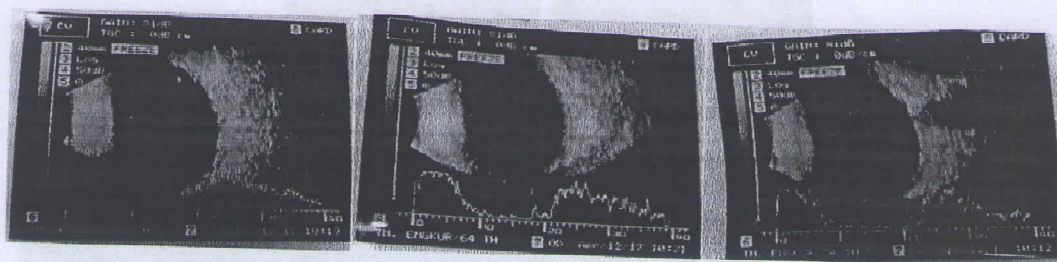
Posterior segment on right eye can't be examined because of hazy media. Ultrasonography examination showed vitreous cavity was echogenic with obscured, low to medium reflectivity, medium to high mobility and double layered appearance. Posterior segment on left eye was within normal limit.

The patient was diagnosed with endophthalmitis OD + Pseudofakia ODS+ Posterior Capsular Opacity grade III OS + Diabetes Mellitus + Hypertension. Patient was underwent Pars Plana Vitrectomy + Intra Vitreal Antibiotics with Ceftazidime and Vancomycin + Dexamethasone intravitreal + Vitreous tapping + Culture and Resistency in the same day when he admitted to emergency. The Surgery was done with Mean Anesthesia Care. Before the operation, his blood pressure was 170/90 and blood glucose fasting level was 287mg/dl, so that he has consulted to internist and got amlodipine 10 mg sublingual and Novorapid 6

units subcutan. One hour after he got the medicine, his blood pressure was 150/80 and blood glucose fasting level was 198 mg/dl. During operation, have been found infiltrate on superior quadrant of retina with slightly cloudy media.

The patient was treated with Cefotaxime 2x1 gr intravenous, Paracetamol 3x500 mg, Prednisolone acetate eye drop, one drop every hour, Moxifloxacin eye drop, one drop every hour and Cyclopentolate 1 % eye drop three times a day on right eye.

Ophthalmologic examination on first day after surgery on the right eye, visual acuity was hand movement. Anterior segment was blepharospasm on palpebral, subconjunctival bleeding, corneal edema with Descemet fold. Anterior chamber was van herick grade III with flare/cell +4/+4, and there was coagulum. The pupil was irregular with synechia posterior. Fibrin covered the lens. Posterior segment was hazy media. Microbiology examination have found gram positive coccus one to one arrangement 0-2 every visual field, leukocytes 1-2 every visual field. There no fungi nor acanthamoeba was found. Posterior examination showed hazy media, difficult to be evaluated. Ultrasonography examination showed vitreous cavity was echogenic with obscured, low to medium reflectivity, medium to high mobility and double layered appearance. The image of ultrasonography seem better than before surgery.

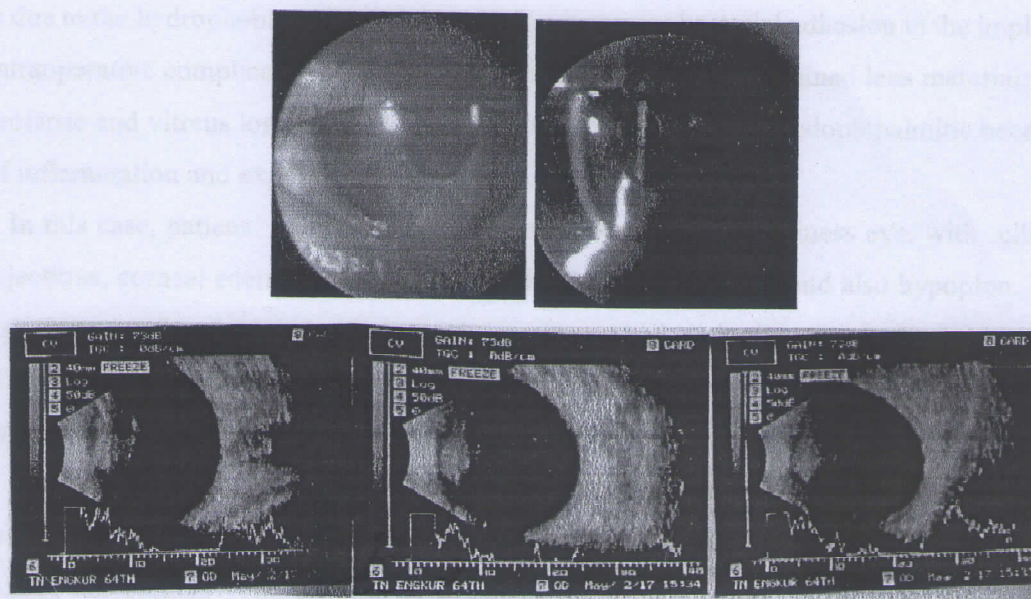


Picture 2.3 Ultrasonography of right eye on 12th April 2017

Ophthalmologic examination on second day after surgery, the visual acuity was hand movement. Anterior segment was blepharospasm on palpebral, subconjunctival bleeding, corneal edema with Descemet fold. Anterior chamber was van herick grade III with flare/cell +4/+4, and there was coagulum. The pupil was irregular with synechia posterior. Fibrin covered the lens. The therapy was the same with the day before. The patient can be outpatient after the sixth intravenous antibiotics, and continued by ciprofloxacin 750 mg two times a day.

One week after operation, the patient controlled to Vitreoretina clinic. Ophthalmology examination on the right eye, the visual acuity was. eye 0,125. There were minimally subconjunctival bleeding and corneal edema. Anterior chamber was van herick grade III with flare/cell +3/+3. There was no fibrin covered the lens. The patient was given prescription prednicolone acetate one drop every hour, moxifloxacin eight times a day, cyclopentolate 1 % three times a day, ciprofloxacin 750 mg two times a day.

Three week after operation, the patient controlled to Vitreoretina clinic. Ophthalmology examination on the right eye, the visual acuity was. eye 0,25. There were minimally ciliary injection and relatively clear cornea. Anterior chamber was van herick grade III with flare/cell +2/+2. There was no fibrin covered the lens. The patient was given prescription prednicolone acetate one drop every hour, moxifloxacin eight times a day, cyclopentolate 1 % three times a day, ciprofloxacin 750 mg two times a day. . The patient was given prescription prednicolone acetate one drop six times a day, five times a day and three times a day, dose reduction every week. , moxifloxacin eight times a day, cyclopentolate 1 % two times a day



Picture 2.4. Anterior segment and ultrasonography examination of right eye on 2nd May 2017

III. DISCUSSION

The clinical features of endophthalmitis after anterior segment surgery include marked intraocular inflammation, often with hazy anterior chamber due to fibrin, cells, bacteria, increased protein content, occasionally blood and hypopion, conjunctival vascular congestion, corneal edema with, eyelid edema and pain. Symptoms often include pain and marked loss of vision that is usually profound and out proportion to typical postoperative visual acuity measured during the first days or weeks after intraocular surgery.^{1-4,8}

There is a range of technical factors relating to the cataract operation that influence the risk of endophthalmitis. With regard to the incision, leak-proof closure plays an important role. There may be intraocular contamination due to passage of contaminated tears or conjunctival organisms into the anterior chamber. Advanced patient age is correlated with factor such as slower rate of healing or lower resistance to infection. There is considerable that Black people have a greater incidence of postoperative endophthalmitis. The reason for this appears to be greater incidence of comorbidity such as diabetes. Diabetes retinopathy plas an important role in the development of endophthalmitis in the diabetic patients. Silicone intraocular lenses has 3.13 times greater for risk of endophthalmitis. This is due to the hydrophobic nature of silicone that increases bacterial adhesion to the implant. Intraoperative complications such as posterior capsule rupture, retained lens material, iris prolapse and vitreous loss are correlated with the development of endophthalmitis because of inflammation and exposure of the vitreous.⁴⁻⁶

In this case, patiens complained about blur vision, pain and redness eye, with ciliary injections, corneal edema with descemet folds, flare and cells +4, and also hypopion. The risk factors of endophthalmitis are advanced age and diabetic comorbidity. Although diabetic retinopathy was not found in fundus examination, uncontrolled blood glucose still can cause endophthalmitis.⁵

The classification of postoperative endophthalmitis is based on the time of onset and the organisms most frequently isolated. Acute onset endophthalmitis within six weeks of intraocular surgery. The bacteria is usually coagulase-negative *Staphylococcus* species including *Staphylococcus aureus*, *Streptococcus* species, gram negative organisms. Delayed onset endophthalmitis occurs beyond six weeks after surgery. The bacteria is usually *Propionibacterium acnes*, coagulase-negative *Staphylococcus* species, fungi. Bleb-associated endophthalmitis can occurs within months or years after surgery. The organisms

such as *Streptococcus* species, *Haemophilus* species, gram-positive organisms can be involved.^{1,2}

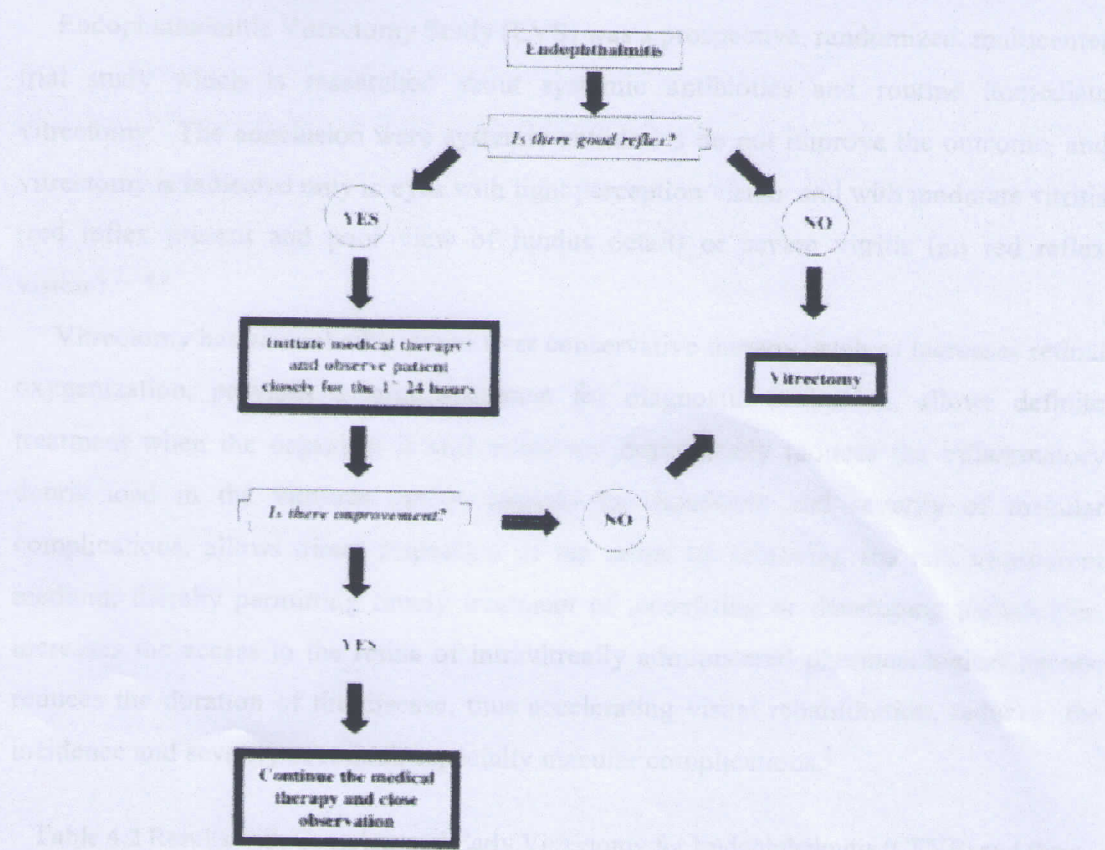
Table 3.1 The most common organisms in acute postoperative endophthalmitis

Microorganisms	Comment
<i>Staphylococcus epidermidis</i>	Relatively nonvirulent; by far the most common organism (40-70%), especially in diabetes
<i>Staphylococcus aureus</i>	Quite virulent; 10-20% of those positive culture
<i>Streptococcus</i> species	Quite virulent; 6-9% of those positive culture
Gram negative rods (<i>Proteus</i> , <i>Pseudomonas</i> , <i>Serratia</i>)	Virulent, relatively rare
<i>Bacillus</i> species	Very virulent, extremely rare

Source : Kuhn²

In this patient was categorized as acute onset endophthalmitis, because he felt blur, pain and redness on left eye approximately after two weeks underwent cataract surgery. The possibility microorganisms that caused endophthalmitis in this patient is *Staphylococcus epidermidis*, because of cellular morphology gram positive coccus with one by one arrangement. But definite result can be taken from culture resistance.

The intravitreal organism causes severe inflammation, some of the most significant visual consequences of the infection, such as cystoid macular edema and epimacular membrane formation, are caused by the body response, rather than by the organism directly. The cell wall of the organism may be toxic, and the bacterium may secrete endo- and exotoxins as well as harmful enzymes. These lead to various retinal pathologies, including widespread necrosis. This volatile mixture such as inflammatory debris, including organism, white blood cells, humoral agents are rather heavy and tend to sink toward the deepest point of the vitreous cavity. Virulence of the pathogen for the clinician is indicated by how early after surgery the infection presents, how rapidly the disease progresses from early to advanced, and how severe the signs are.² In this patient there was rather cloudy media with infiltrate at superior quadrant of retina that caused by the microorganism.^{2,-4,8}



Picture 3.1 Treatment algorithm of Complete and Early for Vitrectomy Endophthalmitis
Source : Kuhn²

Principle of therapy endophthalmitis are killing the organism, removing the inflammatory debris, block the inflammatory cascade and its effects on the retina, treat the complications of the infection, minimize future complications and to intervene as soon as possible. In this patient, the intervention was done in the same day when he admitted to emergency unit. The patient underwent pars plana vitrectomy, anterior chamber wash out, vitreous tapping and culture resistance, intravitreal antibiotics with ceftazidime and vancomycin and also dexamethasone intravitreal.^{2,3,8}

The primary line of treatment for the vast majority of eyes with endophthalmitis should be vitrectomy. The decision whether surgery is performed is driven not by the visual acuity but by the clinical appearance. This is especially important since deterioration can be rapid, leading to irreversible but otherwise preventable damage. In such cases, preoperative ultrasound evaluation is generally performed to rule out retinal detachment and to document the presence or absence of a posterior vitreous detachment.^{1-5,8}

Endophthalmitis Vitrectomy Study (EVS) was a prospective, randomized, multicenter trial study which is researched about systemic antibiotics and routine immediate vitrectomy. The conclusion were systemic antibiotics do not improve the outcome, and vitrectomy is indicated only in eyes with light perception vision and with moderate vitritis (red reflex present and poor view of fundus detail) or severe vitritis (no red reflex visible).^{2,3,8,9}

Vitrectomy has several advantages over conservative therapy, such as increases retinal oxygenization, provides a large specimen for diagnostic evaluation, allows definite treatment when the organism is still unknown, dramatically reduces the inflammatory debris load in the vitreous cavity, reduces the incidence and severity of macular complications, allows direct inspection of the retina by removing the non transparent medium, thereby permitting timely treatment of coexisting or developing pathologies, increases the access to the retina of intravitreally administered pharmacological agents, reduces the duration of the disease, thus accelerating visual rehabilitation, reduces the incidence and severity of retinal, especially macular complications.²

Table 4.2 Results with Complete and Early Vitrectomy for Endophthalmitis (CEVE) and their comparison with those in the EVS

Variable	EVS, vitrectomy	EVS, no vitrectomy	CEVE
Number of eyes	218	202	47
Retinal detachment	2,9%	7,2%	0%
Enucleation/evisceration/phthisis	2,5%	6,2%	0%
Expulsive hemorrhage	1,9%	4,9%	0%
Repeat vitrectomy	0%	6,0%	0%
No light perception final vision	4%	5%	0%
Final visual acuity 20/50 or greater	54%	52%	91%

* $p < 0.0001$, Fisher's exact test, comparing EVS and CEVE outcomes

Source : Kuhn²

Complete and early vitrectomy for endophthalmitis allows definite treatment, reduces the incidence and severity of retinal, especially macular, complications. Early vitrectomy reduces the risk of surgery via improved visibility and decreased tissue fragility. Only a complete vitrectomy allows detachment of the posterior hyaloid and complete removal of the pus and debris.²

Statistically significant better anatomical and functional results were found with CEVE than in either management arm in the EVS. Complete and early vitrectomy is the primary treatment option, rather than being applied as a last resort.²

According to the randomized, multi-center Endophthalmitis Vitrectomy Study (EVS), systemic antibiotics do not appear to have any effect on the course and outcome of endophthalmitis after cataract operations. However, the study design used different drugs systemically (amikacin and ceftazidime) from those used intravitreally (vancomycin and ceftazidime), which does not contribute towards maintaining effective antibiotic levels within the eye. Thirty eight percents of eyes with endophthalmitis demonstrated Gram-positive cocci, against which ceftazidime is only slightly active, whereas vancomycin would have been much more effective. Adjunctive systemic antibiotic therapy is recommended with the same antibiotics as those given intravitreally for management of acute bacterial endophthalmitis.^{8,9}

Vancomycin provides good cover for Gram-positive bacteria including methicillin-resistant *Staphylococcus aureus* (MRSA). Ceftazidime is used to cover the Gram-negative spectrum. Moxifloxacin, levofloxacin, and imipenem are effective against Gram-positive and -negative bacteria but have not yet been fully evaluated for intravitreal use and should not be used at present.^{5,8,9}

Clindamycin, vancomycin, or cefuroxime are effective for *Propionibacterium acnes* endophthalmitis. However, this must often be preceded by surgery, combined with intravitreal antibiotic injection. For fungal infection, systemic amphotericin should be used systemically if it has been given by the intravitreal route. In addition, systemic imidazoles are often given but are more likely to be effective for systemic infection.⁸⁻¹⁰

Effective anti-inflammatory therapy, such as with corticosteroids, is rational in order to limit tissue destruction by infiltrating leukocytes, to stem the effect of antigens and highly inflammatory cell walls released by bacterial disintegration after administration of antibiotics, and to diminish the toxic effects of intraocular cytokines. Intravitreal dexamethasone injection (400mg in 0.1mL) at the end of the vitrectomy leads under antimicrobial therapy to a more rapid subsidence of the intraocular inflammation, but without improving the long-term functional outcome.⁸⁻¹⁰

Oral administration of prednisolone (1mg/kg body weight) a day after intravitreal antibiotic therapy with or without vitrectomy has shown positive effect on the course of infection in bacterial endophthalmitis. In this case, the patient was not given

methylprednisolone oral, but given prednisolone topical due to history of Diabetes Mellitus.^{2,8-13}

To summarize, not only the microbes but also their interplay with the immune mechanisms are important in the outcome of endophthalmitis. Cell walls of dead bacteria, especially those of streptococci, and including those recently killed by antibiotics, are highly inflammatory. As a direct consequence, anti-inflammatory treatment with intravitreal dexamethasone (400mg in 0.1mL) should be given along with specific intravitreal antimicrobial therapy. This may not be advisable, however, in fungal endophthalmitis, and a decision for their use should be judged against the degree of inflammation and the virulence, and the sensitivity test result if known, of the infecting fungus.^{2,8-10}

The intervention to this patient resulting good outcome. We can see from ophthalmology examination at three weeks after interventions, visual acuity which was increase from hand movement to 0,25. Ciliary injection, corneal edema, flare and cell were decreased. Hypopion was not found, and fundus examination was clearly to see the details.

The prognosis in this patient quo ad vitam ad bonam regarding no life threatening. The infection is resolving and does not spread to other site. Prognosis quo ad sanationam is dubia. As long the patient can control blood glucose level and use medication properly, the infection could not be worse. Prognosis quo ad functionam is dubia ad bonam. The visual outcome and inflammation getting better, so that visual function possible to recover.

IV. CONCLUSION

Most of the post operative endophthalmitis occur after cataract extraction. The risk can increase with history of diabetes, advanced age, wound leak and intraoperative complications. Management of post operative endophthalmitis with complete and early vitrectomy, intravitreal antibiotics and dexamethasone give a good result. Antibiotics and anti-inflammatory systemic therapy, and also blood glucose control play a role to resolve the infection.

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