



Research Article

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## **Endophthalmitis After Intravitreal Injections: Early Presentation, Management and Visual Outcome**

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### **Abstract**

**Aim:** *To report the importance of early presentation and diagnosis of infectious endophthalmitis after intravitreal injections (IVI) of anti-vascular endothelial growth factor (anti-VEGF) agents and its effect on the management and the final visual outcome, and comparing the early pars plana vitrectomy (PPV) with the medical management using the intravitreal antibiotics.*

**Methods:** *A retrospective study conducted on patients were diagnosed and managed as cases of endophthalmitis after receiving intravitreal injections of anti-vascular endothelial growth factors at Jordanian Royal Medical Services between February 2018 and September 2019. The medical records of endophthalmitis patients were reviewed regarding age, gender, systemic disease, ocular disease, indication for anti-VEGF, time of presentation after injection, time of attendance, type of treatment presented to the patients and visual acuity before injection and post injection.*

**Results:** Ten patients aged between 51 and 72 patients (mean 60.5 years) were included in the study, six of them were males. Seven patients had received anti-VEGF for diabetic macular edema (DME), two for wet age-related macular degeneration (AMD) and one for macular edema secondary to branch retinal vein occlusion (BRVO). The most common presentation was severe pain (100%) followed by redness (80%) and deterioration of vision (70%). Cultures were positive in 7 patients. Six patients received intravitreal antibiotics; three of them retained the same vision before the injection while three of them lost additional one line of vision. Three patients had PPV; one of them did not show an improvement in vision. One patient underwent evisceration when he presented with no light perception after seven days of onset of symptoms and did not improve with intravitreal antibiotics injection.

**Conclusions:** Early presentation and early diagnosis of infectious endophthalmitis after intravitreal injection of anti-VEGF has a great impact on the response to treatment and the final visual acuity of patients, whether managed with early PPV or IVI of antibiotics. Giving intravitreal injection at strict sterile techniques will greatly minimize the incidence of endophthalmitis.

## Introduction

Endophthalmitis refers to intra ocular inflammation mostly of infectious origin. It can be classified based on entry route into exogenous and endogenous. (1) Infectious causes include bacterial, viral, fungal and parasitic organisms. (2) Because of the extensive use of intravitreal injection in the last decade, the rate of endophthalmitis raised as well. (3) Intravitreal injections are used for treatment of various macular diseases like diabetic macular edema, age related macular degenerations, choroidal neovascularization, uveitis macular edema and macular edema secondary to retinal vein occlusion. (4) Ocular surgeries and spread of the infections from infected nearby structures can cause exogenous endophthalmitis as well. (5)

Endophthalmitis is a serious condition which is associated with high rates of morbidity and irreversible visual deterioration. (6) A lot of factors affect the prognosis of visual outcome which includes: the preexisting ocular disease, time of attendance, time and type of treatment presented to the patient and the control of systemic diseases.

The aim of this study was to report the effect of early presentation and diagnosis of infectious endophthalmitis after intravitreal injections (IVI) of anti-vascular endothelial growth factor (anti-VEGF) on the final visual outcome and to compare the results of early pars plana vitrectomy (PPV) with the medical management using the intravitreal antibiotics.

## Methods

A retrospective study conducted on Patients were diagnosed and managed as cases of endophthalmitis after receiving intravitreal injections of anti-vascular endothelial growth factors at Jordanian Royal Medical Services between February 2018 and September 2019. The medical records of endophthalmitis patients were reviewed regarding age, gender, systemic disease, ocular disease, indication for anti-VEGF, time of presentation after injection, time of attendance, type of treatment presented to the patients and visual acuity before injection and post injection.

## Results

Ten patients aged between 51 and 72 patients (mean 60.5 years) were included in the study. 6 of them were males. Seven patients received anti-VEGF for diabetic macular edema (DME), two had wet age related macular degeneration (AMD) and one patient had macular edema secondary to branch vein occlusion ( BRVO).

The most common presentation was sever pain (100%) followed by redness (80%) and deterioration of vision (70%) .

Case No.	age	gender	Indication for injection	Time of presentation	Time of receiving treatment	Culture results	Type of injection	Initial management
1.	64	M	DME	4	1	positive	Bevacizumab	PPV
2.	59	F	DME	3	1	Negative	Ranibizumab	IVI anti biotics
3.	54	M	DME	2	2	Negative	Bevacizumab	PPV
4.	52	M	AMD	1	1	positive	Bevacizumab	IVI anti biotics
5.	72	M	AMD	1	1	positive	Bevacizumab	IVI anti biotics
6.	68	M	DME	2	1	Negative	Triamcinolone	IVI anti biotics
7.	51	F	BRVO	2	1	positive	Aflibercept	IVI anti biotics
8.	59	M	DME	7	1	positive	Bevacizumab	evisceration
9.	66	F	DME	2	1	positive	Bevacizumab	IVI anti biotics
10.	60	F	DME	4	1	positive	Aflibercept	PPV

**The demographic features and presentation of the patients are summarized in Table 1**

Time of presentation: day at which the patient presented to the clinic after receiving IVI of anti-VEGF.

Time of receiving treatment: day at which the patient received IVI of antibiotics or underwent PPV after presenting to the clinic.

Case No.	BCVA before injection	BCVA at presentation	BCVA at 1 week	BCVA at 1 month	BCVA at 6 months
1.	0.25	0.01	0.1	0.16	0.16
2.	0.5	0.16	0.24	0.3	0.3
3.	0.1	0.01	0.05	0.1	0.36
4.	0.25	0.1	0.1	0.25	0.25
5.	0.25	0.01	0.1	0.16	0.25
6.	0.3	0.16	0.3	0.3	0.3
7.	0.25	0.1	0.16	0.16	0.16
8.	0.16	No light perception	No light perception	No light perception	No light perception
9.	0.5	0.1	0.16	0.3	0.3
10.	0.25	0.05	0.05	0.05	0.05

**Table 2 summarizes the best corrected visual acuity (BCVA) before the injection and at 1 week, 3 months and 6 months post injection.**

## Discussion

Although intravitreal injections became the commonest cause for endophthalmitis, the incidence of endophthalmitis is still low. (7) age and gender did not affect the incidence, severity and visual outcome of endophthalmitis. Type of the injection did not affect the rate and severity of endophthalmitis nor the visual outcome. Culture was positive in seven causes and in all of them Staphylococcus epidermidis was responsible for endophthalmitis. This reflect that contamination and improper sterilization of the eye during the procedure was the main cause for the development of endophthalmitis.

Intravitreal injection of antibiotics alone was used in six patients; three of them retained the same vision before the injection while three of them lost additional one line of vision. It should be mentioned that most patients presented within 48 hours from the onset of symptoms. This highlights about the importance of early attendance and early introduction of intravitreal antibiotic plays an important role in deceasing the morbidity of endophthalmitis and avoiding major procedure like pars plan vitrectomy

(PPV). The antibiotics that were used in the management of these cases were a combination of vancomycin (1 mg / 0.1 ml) and ceftazidime (2 mg / 0.1 ml). Vitreous biopsies were taken by dry cutting technique using 23-gage cutter then intravitreal antibiotics were injected.

Three patients underwent PPV because of poor response and visual deterioration after intravitreal antibiotics. Two of them attended after 4 days from the onset of symptoms, this reflects the importance of early attendance in minimizing the need for major procedures like PPV. PPV was effective in two patients; one patient had only one line decrease in BCVA and another one improved at one line compared with pre injection BCVA. Unfortunately, one patient continued to have low vision and did not improve after intravitreal injection and PPV (BCVA 0.05 compared to pre injection BCVA of 0.25).

One patient attended after 7 days from the onset of symptoms with no light perception in the eye. vision and pain did not improve after intravitreal injection and so he underwent evisceration.

The risk factors for poor visual outcome in endophthalmitis patients were long duration time of attendance from the onset of symptoms, poor visual acuity at the time of attendance and positive cultures.

## **Conclusión**

Early presentation and early diagnosis of infectious endophthalmitis after intravitreal injection of anti-VEGF has a great impact on the response to treatment and the final visual acuity of patients, whether managed with early PPV or IVI of antibiotics. Giving intra vitreal injection at strict Sterile techniques will greatly minimize the incidence of endophthalmitis.

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