Vitrectomy combined with intracular drug injection on treatment of endophthalmitis

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Abstract: This paper aimed to evaluate the clinical application value of vitrectomy combined with intraocular drug injection on treatment of severe endophthalmitis. Retrospective analyzed the 28 eyes for the 28 cases of patients suffering severe endophthalmitis, and with treatment of pars plana vitrectomy combined with intraocular drug injection, and foreign matter removal surgery. This study also analyzed the whole body and local application of antibiotics data, and clinical data of corticosteroid drug treatment. This study had followed up 6 to 12 monthes, 28 intraocular infected eyes of the 28 cases all had got controlled. The vision of 26 eyes improved to some degree, 2 eyes had eyeball atrophy. vitrectomy combined with intraocular drug injection was the most effective method to treatment the suppurative endophthalmitis.

Keywords: Vitrectomy, intraocular drug injection, endophthalmitis.

INTRODUCTION

Infection endophthalmitis is a badly damaged intraocular infection, and also the most serious postoperative complications of perforating wounds of the eyeball and intraocular surgery. Once it happened without taking effective measures, it often caused the vision loss and eyeball atrophy due to the inflammation and diffusion, even the eyeball could not be retained (Xiao-xin and Jing-zhao 2013). Traditional methods was difficult to control the development of infection, the eventurally vision loss and even eye removal could happen due to the unavoidable infection. In recent years, the development of vitrectomy and improvement of surgery technology had provided an effective method for the treatment of severe endophthalmitis. In 2009, the hospital had applied vitrectomy combined with intraocular drug injection on treatment of 28 eyes of 28 cases of patients, the curative effect is as follows.

MATERIALS AND METHOD

Subjects

There were 28 eyes for 28 cases of patients with infection endophthalmitis, including 24 cases of male, 4 cases of female, aging 6 to 72 years old. The average age is 30 years old. There were 15 cases for right eye and 13 cases for left eye. There were 11 eyes with intraocular metal foreign matter, and 20 eyes had performed the foreign matter removal surgery in other hospital. There were 22 cases of patients with perforating wounds of the eyeball, counting for 79%, and 4 cases of cataract extraction combined with IOL implantation, counting for 14% and 2 cases of glaucoma postoperative endophthalmitis, counting for 7%. In the 28 cases of patients due to vulnerant, 3 cases were due to disposable syringe, 2 cases were due to piton, 8 cases were due to abatis, 1 cases was due to hand sewiing needle, 3 cases were due to high-explosive injury, 5 cases were due to lacerated wound, 4 cases were due to cataract extraction combined with IOL implantation, 2 cases was due to glaucoma operation. The clinical time was 9 to 14 days (average is 5.6 days) after trauma. After hospitalized, the patients were suspected to be with endophthalmitis, and had received anterior chamber puncture and extraction of aqueous humor 0.1ml, or extracted vitreous humor 0.1~0.2ml for bacterial, fungal cultivation and drug susceptibility test, and at the same time, applied the drug injection in vitreous cavity. If patients was suspected to be with bacterial endophthalmitis, and the patients shall be injected vancomycin 10g/L, ceftazidine 10g/L and dexamethasone 10 4g/L, among which vancomycin could not be applied with dexamethasone, as they could create sediment. After the vitreous cavity medicine injection, the nearest time for vitrectomy shall be 18 hours to 4 days, average time is 2 days.

Method

All the adults were anesthesized. The surgeries were performed by full-auto vitreous incision machine from Alcon Company. This surgery was accompanied with Volk image inversion system and panretinal retinoscope and applied the classic flat closed three incision. Before the perfusion during the surgery, this study had extracted vitreous cavity fluid for cultivation and drug sensitive experiment. Among the perfusion fluid for vitreous cavity, there were Gentamicin 4mg, vancomycin 15mg, ceftazidine 20mg and dexamethasone 32mg to be dissolved in solt equilibrium 500mL and gave patients the antibiotics and corticosteroid intravenous infusions in the preoperative, intraoperative and postoperative period. The patients with fungal infection, should forbid to apply

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Table 1: Endophthalmitis visual comparison before and after operation.

Group	Light Sensation	<0.05	0.05 ~ 0.1	0.1 ~ 0.3	0.4 ~ 0.5
Before operation	15	12	1		
After operation	10	4	11	2	1

corticosteroids. After the outcome of the cultivation reports, it should choose sensitive antimicrobial agents for treatment based on different pathogens and drug susceptibility results. During the operation, patients with phacoscotasmus should have the surgery of opacity lens incision, at the same time, it need to remove opacity vitreum, along with the film on the retinal surface, based on retinal pores attachments or not. Then this study applied the heavy water, gas or liquid for intraocular photocoagulation, insurt the inert gas or silicone oil for filling in. For the endophthalmitis vitreous retinal surgery, it required the scleral cerclage, in order to prevent postoperative peripheral residual vitreous traction retinal detachment.

RESULTS

Pathogen examine results

Among the 28 eyes, there were 13 eyes to be tested to be positive for vitreous cultivation, including staphylococcus aureus for 7 eyes, staphylococcus epidermidis for 3 eyes, pneumococcal for 3 eyes and non-infection 10 eyes, and 5 eyes did not detect with pathogens for the 6-12 months of follow-up. 28 eyes inflammation were under control, after the vitrectomy combined with intraocular drug injection along with general and local application of antibiotics and corticosteroid drugs. 26 eyes had improved to some degree, 2 eyes were eyeball atrophy. The vision details before and after surgery was shown in table 1.

Postoperative complication

It was similar with general vitreous surgery complications. For the postoperative high intraocular pressure, 9 cases got control with antihypertensive drugs. 2 cases were with low intraocular pressure, mainly due to the damage of pathogens on ciliary epithelial function, and caused the eyeball atrophy.

CONCLUSION

Endophthalmitis was commonly required through surgery and intraoculor operation. The endogenous endophthalmitis is rare to happen. Postoperative endophthalmitis is normally in glaucoma filtration operation and cataract surgery. Poulse EJ supposed the low intraocular pressure, non blood vessels, thin, and filtering bleb leaking, and multiply history of glaucoma surgery were the risk factor of filtering bleb correlation endophthalmitis (Poulsen 2012). Research had proved that endophathalmitis of pathogenic bacteria spectrum was mainly the gram-positive bacteria. The endophathalmitis of intraocular surgery and penetrating wound were mainly the epidermis *Staphylococcus aureus* (Jia-biao *et al.,* 2014). Epidermis staphylococcus, streptococcus, enterococcus cataract postoperative endophthalmitis were the main pathogenic bacteria. In this study, *Staphylococcus aureus* accounted for the first place, which was consistent with literature reports. The treatment of endophthalmitis included general and local application of antibiotics and corticosteroid, vitreous cavity drug injection and vitrectomy method. Generally Speaking, once the infectious endophthalmitis been diagnosed and should took the operation as soon as possible, as the weak pathogen virulence, less vitreous opacity and the optic disk and large blood vessels through indirect ophthalmoscope (Han 2013). Inflammation had not yet been progress in patients with mild symptom, the first option was vitreous injection, as it was with obvious curative effect, repeatable and dosing intervals was 2 to 7 days. Disease with rapid development, and invalid multiple intraocular injection, anterior chamber empyema, aggravating vitreous opacity, weakening eyesight and the blood vessels could not be seen. This could indicate the patients should perform vitreous retinal surgery, and the type-B ultrasonic diagnosis shown the vitreous opaque severe endophthalmitis (Xiang-dong *et al.,* 2012).

Vitrectomy is an effective method for treatment of endophthalmitis. Most scholars thought that drug treatment should arranged within 8 to 24hours after the diagnosis. If inflammation become aggracing, the vitrectomy operation. According to the files of vitrectomy study team, either patients applied the general antibiotics, the final version prognosis of the endophthalmitis had no difference. Endophthalmitis vision was not well, which should immediately have vitrectomy. Compared with non-operation, its results were significantly better. While, if the preoperative vision was only the light sensors, surgical treatment of sight was better than non-surgical, thus the operation was an effective method for treatment of severe endophthalmitis, especially severe endophthalmitis should immediately perform surgery. For endophthalmitis control, the intraocular antibiotics direct application was significantly better than the efficacy of general antibiotics application. This was mainly related to blood retinal barrier, which was difficult to penetrate for antibiotics. The application of intraocular drug injection, which were intraocular drug direct perfusion and vitrectomy combined with intraocular drug injection in vitreum cavity. The last one not only could remove turbid medium and pathogen vitreous gel medium for pathological changes, in order to spread into the eyes for the medicine

and remove pathogens and toxin; This study had draw vitreous samples for cultivation and drug susceptibility based on the retina situation, and further solved the complications caused by vitreous traction (Mackiewicz 2012).

Because the surrounding of vitrum was hardly be totally removed, most scholars advocated endophthalmitis patients without retinal detachment could perform prophylactic scleral buckling, in order to prevent postoperative tractional retinal detachment. Scleral cerclage technique not only could observe the intraoperative detached retinal reposition, but also prevent the postoperative tractional retinal detachment (Shou-zhi 1999). For keep the lens, there were 8 cases of patients have more parts of vitreous remained and had the preventive scleral cerclage. There were no cases which occurred postoperative retinal detachment. In a conclusion, vitrectomy combined with intraocular drug injection was an effective method for treatment of infectious endophthalmitis and need to perform vitreous scleral cerclage and intreous retinal surgery, such as filling subjects, this could save part of visual function in patients with severe endophthalmitis.

REFERENCES

Han DP (2013). Spectrum and susceptibilities of microbiologic isolates in the endophthalmitis vitrectomy study. *Am. J. Ophthalmol.,* **122**: 1-3.

He SZ (1999). Ophthalmic micro scopics (1st edition). Beijing: People's Medical Publiching House pp.398-399.

Li XX and Wang JZ (2013). Vitreous retinal operative surgery (1st edition). People's Medical Publishing House, Beijing, China, pp.369-370.

Lu JB, Lin ZD and Zou YP (2014). Germ cultivation results analysis on 304 cases of suppurative endophthalmitis. *Chin. J. Ophthalmol.,* pp.355-359.

Mackiewicz J (2012). Vitrectomy in the treatment of endopphthalmitis. *Klin. Oczama.,* **103**: 17-19.

Poulsen EJ (2012). Characteristics and risk factors of infections after glaucoma filtering surgery. *J. Glaucoma.,* **9**: 438-440.

You XD, Jin ZQ, Zhou HZ, Chen X and Chen YH (2012). Clinical observation on extration of vitreous body from vitreum. *Int. J. Ophthalmol.,* **4**: 473-474.