An Outbreak of Acute Postoperative Endophthalmitis after Cataract Surgery

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Background: *Endophthalmitis is one of the most serious complications of ophthalmic surgery, which includes postoperative cataract extraction. Outbreak of acute postoperative endophthalmitis after cataract surgery has been reported in Thailand and other countries.*
Objective: *To describe an outbreak of acute postoperative endophthalmitis after cataract surgery that was referred to Chiang Mai University Hospital during March 2006.*
Material and Method: *Observational case series were made from the records of inpatients and outpatients, who had been referred for treatment of acute postoperative endophthalmitis after cataract surgery at a district hospital in northern Thailand. The surgery was conducted on two consecutive days by volunteer ophthalmologists of a non-profit foundation from Bangkok.*
Results: *In this outbreak, the authors recorded 31 endophthalmitis cases, with 33 eyes (bilateral 2 cases). Of the 33 endophthalmitis eyes, 32 occurred following extracapsular cataract extraction with intraocular lens and one after the secondary intraocular lens implant. Microbiological investigations in the hospital were done with aqueous tapping, vitreous tapping, and vitreous from pars plana vitrectomy. Gram-positive cocci were detected from vitreous tapping in four eyes. Thirty-two cases were managed with intravitreous antibiotics, one with subconjunctival antibiotic only, and all eyes were treated with fortified topical antibiotics. Fifteen eyes underwent pars plana vitrectomy. Assessment of visual acuity (VA) before and after treatment showed improvement in 75.8% (25/33), decrease of VA in 9.1% (3/33), while visual acuity remained stable in 15.2% (5/33).*
Conclusion: *In high-volume cataract surgery, an outbreak of endophthalmitis is always possible. Prompt and appropriate treatment can improve the visual outcome.*

Keywords: *Endophthalmitis, Outbreak, Acute postoperative, Cataract surgery*

J Med Assoc Thai 2008; 91 (8): 1239-43
Full text. e-Journal: *http://www.medassocthai.org/journal*

Endophthalmitis is a serious and devastating complication of intraocular surgery including cataract extraction[1-5]. The authors report an outbreak of acute postoperative endophthalmitis after cataract surgery, with attention to visual outcomes following treatment.

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Material and Method

During March 2006, 31 cases of acute postoperative endophthalmitis were referred to Chiang Mai University Hospital, Chiang Mai, Thailand. All of the referred patients had been treated at a district hospital in northern Thailand on two consecutive days by volunteer ophthalmologists of a non-profit foundation. This foundation had previously carried out ocular surgery campaigns in this hospital for more than 10 settings, without any prior severe complications. In this setting, 184 eyes of 179 patients underwent surgery,

including 153 extra-capsular cataract extraction (ECCE), 16 phacoemusification (PE), five trabeculectomy, three pterygium excision, one secondary intraocular lens (IOL) implantation, and one entropion correction. Endophthalmitis occurred in 33 eyes of 31 patients, of which 32 eyes (30 cases) had undergone ECCE, and one eye had undergone secondary IOL implantation. Endophthalmitis was defined as the inflammory disease of the intraocular tissue predominantly in the vitreous cavity and/or anterior chamber, either infectious or noninfectious[6].

The patients' data, including age, sex, systemic diseases, date and type of operations, duration of symptoms, previous treatment, visual acuity (VA), and details of ocular findings, were recorded.

Investigations from the anterior chamber and/or the vitreous specimens consisted of Gram staining and KOH wet preparation, and cultivation on the conventional culture media, which consisted of blood agar, chocolate agar, and Sabouraud's dextrose agar. All inoculations were directly done on each media. Each eye was analyzed separately for visual outcome by comparing the visual acuity on the date of admission with that on the date of discharge. Improved or decreased visual outcome was defined for eyes with VA 3/60 or better by a change of two or more lines on the Snellen chart. Eyes with VA less than 3/60 were defined by a change from one of the following categories to another: finger count (FC), hand motion (HM), light projection (PJ), light perception (PL), and no light perception (NPL). Stabilization was defined as no change in VA or a change less than those described above[7].

Statistical analysis and computations were performed with the statistical program, SPSS for Windows Version 10.0 (SPSS Inc., Chicago, USA). The frequency table, with number and percentage, was described with descriptive statistics (range, mean and SD).

The present study protocol was approved by the research ethics committee of the Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand (No. 096/2006).

Results

The baseline characteristics of the patients on admission date are shown in Table 1. Duration of symptoms ranged from one to four days after surgery. Most of the patients (21 cases) had no systemic diseases, but the others had some diseases as follows: three had hypertension (HT), two diabetes mellitus (DM), one anemia, one pulmonary disease, one heart disease, and one DM with HT and gouty arthritis.

Microbiologic analysis showed Gram-positive cocci in four vitreous tap specimens, but the cultures from these specimens had no growth. The specimens both from the aqueous tapping and the vitreous from pars plana vitrectomy were negative on Gram stain and culture.

All eyes were treated with the fortified topical antibiotics of cefazoline and gentamicin. Intravitreal antibiotics of ceftazidime and vancomycin were administered in all cases except one eye, which had a VA on admission of 6/12 and received only subconjunctival antibiotic of vancomycin. Pars plana vitrectomy (PPV) was performed in 15 eyes. Intravitreal steroid of dexamethasone was administered in 12 eyes of PPV. Subconjunctival steroid was injected in 11 eyes, of which three eyes had PPV. Fortified topical steroid was given in 21 eyes.

The VA on discharge date was recorded and compared to that on admission date, as shown in Table 2. The final visual outcome, which was compared to the VA on admission date, is shown in Table 3.

Table 1. The baseline characteristics of the patients on admission date

Characteristics	Number (%)
No. of patients	31
Age (years)	
Mean $\pm$ SD	70.4 $\pm$ 1.4
Range	45-97
Sex	
Male	17 (54.8)
Female	14 (45.2)
Laterality	
Unilateral	29
Bilateral	2
Visual acuity (eyes)	
6/12-6/18	2
< 6/18-3/60	6
< 3/60-Fc	5
HM	7
PJ	6
PL	5
NPL	2*

Fc = finger count, HM = hand motion, PJ = projection of light, PL = perception of light, NPL = no light perception
* VA prior to operation

Table 2. The visual acuity (VA) on discharge date compared to that on admission date

VA	No. on admission	No. on discharge
6/12-6/18	2	7
< 6/18-3/60	6	18
< 3/60-Fc	5	5
HM	7	1
PJ	6	0
PL	5	0
NPL	2*	2

Fc = finger count, HM = hand motion, PJ = projection of light, PL = perception of light, NPL = no light perception
* VA prior to operation

Table 3. The final visual outcome compared to the visual acuity (VA) on admission date

VA on admission	Visual outcome			Total
	Improved	Stable	Decreased	
6/12-6/18	-	1	1	2
< 6/18-3/60	3	2	1	6
< 3/60-Fc	4	-	1	5
HM	7	-	-	7
PJ	6	-	-	6
PL	5	-	-	5
NPL	-	2	-	2*
Total	25	5	3	33

Fc = finger count, HM = hand motion, PJ = projection of light, PL = perception of light, NPL = no light perception
* VA prior to operation

Discussion

Postoperative endophthalmitis is the most devastating complication following cataract surgery. It may result in visual loss, and many investigators are interested in ways to prevent it[5,8-12]. An outbreak of acute postoperative endophthalmitis after cataract surgery is uncommon, but it has been reported several times[13-23].

In Thailand, there also have been some reports of this unfortunate event[24-27], which revealed several factors including defects in sterilization of surgical instruments, poor operating room hygiene, contaminated tap water, the use of multiple-dose fluids and medication[24,27], and the intraoperative use of intrinsically contaminated intraocular irrigating solution[25,26].

When an outbreak is identified, the source of infection should be pursued using microbiological culture specimens from the operative suite, the operating team, IOL, irrigating fluids, and surgical equipment. One should also seek or undertake an epidemiologic investigation to determine risk factors[17,24-27]. In this setting, no source of infection was found. The retrospective review of the surgical team was reported that most referred cases had used the same series of IOL from one manufactory, so the common risk factor was suspected to be the hypersensitivity reaction to the IOL.

The overall reported incidence of endophthalmitis after extracataract extraction (ECCE) and phacoemusification (PE) in the United States ranged from 0.07% to 0.13%[5]. The reported incidence in a medical hospital in Thailand was 0.37% after ECCE and 0.28% after PE[28]. Clearly, in the high-volume circumstances, an outbreak of endophthalmitis is always possible. This present report underscores the need for better surveillance of this condition to provide early detection and prompt intervention of the outbreak.

Toxic anterior segment syndrome (TASS) should be considered when there is no positive culture, because four cases in the present investigation were found to have Gram-positive cocci. TASS[29] is a sterile postoperative inflammation caused by noninfectious substances that enter the anterior segment, resulting in toxic damage to intraocular tissues. The process usually starts 12 to 48 hours after anterior segment surgery, is typically limited to the anterior segment of the eye, is always Gram stain and culture negative, and usually improves with steroid treatment alone. Because of a negative culture, TASS may be a suspected etiology of these postoperative inflammation.

From the report of the surgical team, the follow up VA at two weeks after discharge from the hospital was as follows: 12 eyes had 6/6-6/18, 15 eyes had < 6/18-3/60, two eyes had < 3/60-Fc, 1eye had PJ, and two had NPL. No eye was enucleation since the eyes with NPL had that vision before surgery.

The present study wishes to address the awareness of postoperative endophthalmitis from surgery in a mass campaign, either infectious or noninfectious. Early recognition with prompt and appropriate treatment can improve the visual outcome.

Acknowledgement

The authors wish to thank Winai Chaidaroon, MD, who coordinated with the district hospital to gather previous data of the patients.

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รายงานการระบาดของการอักเสบในลูกตาแบบเฉียบพลันหลังผ่าตัดต้อกระจก

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***ภูมิหลัง**: การอักเสบในลูกตาเป็นภาวะแทรกซ้อนที่รุนแรงที่สุดอย่างหนึ่งของการผ่าตัดตาซึ่งรวมถึงการผ่าตัดต้อกระจก การระบาดของการอักเสบในลูกตาแบบเฉียบพลันหลังผ่าตัดต้อกระจกเคยมีรายงานในประเทศไทยและประเทศอื่น ๆ*

***วัตถุประสงค์**: เพื่อรายงานการระบาดของการอักเสบในลูกตาแบบเฉียบพลันหลังผ่าตัดต้อกระจกที่ได้ส่งต่อผู้ป่วยมารักษาที่คณะแพทยศาสตร์ มหาวิทยาลัยเชียงใหม่ ระหว่างมีนาคม พ.ศ. 2549*

***วัสดุและวิธีการ**: ทำการศึกษาแบบสังเกตในกลุ่มผู้ป่วยจากเวชระเบียนผู้ป่วย ซึ่งถูกส่งตัวมารับการรักษาการอักเสบในลูกตาแบบเฉียบพลันหลังผ่าตัดต้อกระจกที่โรงพยาบาลชุมชนแห่งหนึ่งในภาคเหนือของประเทศไทย ซึ่งได้ทำการผ่าตัดในเวลา 2 วันโดยอาสาสมัครจากมูลนิธิหนึ่ง*

***ผลการศึกษา**: ผู้ศึกษาได้รายงานผู้ป่วยอักเสบในลูกตาแบบเฉียบพลันหลังผ่าตัดต้อกระจก 31 ราย (33 ตา) โดยเกิดหลังผ่าตัดใส่เลนส์เทียม แบบ extracapsular cataract extraction 32 ตา และ ผ่าตัดใส่เลนส์เทียมแบบทุติยภูมิ 1 ตา ผลการสืบสวนทางจุลชีววิทยาพบ Gram positive cocci จากน้ำวุ้นตา 4 ราย ผู้ป่วยทุกรายได้รับการรักษาด้วยยาหยอดตาปฏิชีวนะแบบเข้มข้น ร่วมกับฉีดยาปฏิชีวนะเข้าวุ้นตา 32 ตา ฉีดยาปฏิชีวนะเข้าใต้เยื่อบุตา 1 ตา และทำผ่าตัดแบบ pars plana vitrectomy 15 ตา จากการประเมินสภาพการมองเห็นก่อนและหลังรักษา พบว่าสายตาดีขึ้น 75.8% (25 ตา) สายตาลดลง 9.1% (3 ตา) และสายตาคงเดิม 15.2% (5 ตา)*

***สรุป**: การผ่าตัดตาต้อกระจกในปริมาณมาก อาจเกิดการระบาดของ การอักเสบในลูกตาแบบเฉียบพลันได้ การรักษาที่เหมาะสมและทันทีจะช่วยให้สายตาดีขึ้น*