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## ENDOPHTHALMITIS FOLLOWING CATARACT SURGERY CONSIDERED TO BE DUE TO AN ORAL PATHOGEN

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*Abstract* : We encountered a case of endophthalmitis after cataract surgery in which  $\alpha$ -streptococcus was regarded as prophlogistic bacillus. Preoperatively, sterilization of the eyelid and conjunctival sac was performed. The surgical methods included temporal corneal incision and surgery was completed uneventfully. Eight days postoperatively, symptoms of endophthalmitis appeared ; vitrectomy and IOL extraction were performed the following day but retinal function was damaged, so the best visual acuity remained 0.01. It seemed that the most probable source of infecting bacteria came from the oral cavity. Furthermore,  $\alpha$ -streptococcus was detected in aqueous humor, vitreous body, left eyelid skin and oral cavity. Because this patient used an artificial larynx, Tapia, discharge from the oral cavity reached the conjunctival sac.

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**Key words** : endophthalmitis, cataract surgery, oral parasite,  $\alpha$ -streptococcus

### INTRODUCTION

Phacoemulsification and intraocular lens implantation (PEA+IOL) has become a reliable procedure providing stable results. However, the incidence of postoperative complication is not zero. Endophthalmitis is the most serious postoperative complication, causing permanent visual impairment.

In this brief report, we describe a case of endophthalmitis due to  $\alpha$ -streptococcus, a Gram-positive bacterial strain of the oral environment that became a prophlogistic bacillus postoperatively.

### CASE

An 80-year-old man with a previous history of lower pharynx laryngectomy for a lower pharynx tumor in 1999, complained of visual disturbance. Family history was not remarkable. PEA+IOL was performed as day surgery in a local clinic in March 2002. Sterilization of the conjunctival sac by a LVFX (Cravit® ophthalmic solution) was performed preoperatively for 5 days. For sterilization of the operative field, the eyelid skin was first washed with 10% Popidone iodine (Isozine®), and then the conjunctival sac was washed with 0.2% Isozine. Surgical approach was a temporal corneal incision (3.5mm) after topical anesthesia (4% lidocaine). Continuous curvilinear capsulorhexis (CCC) was performed and a

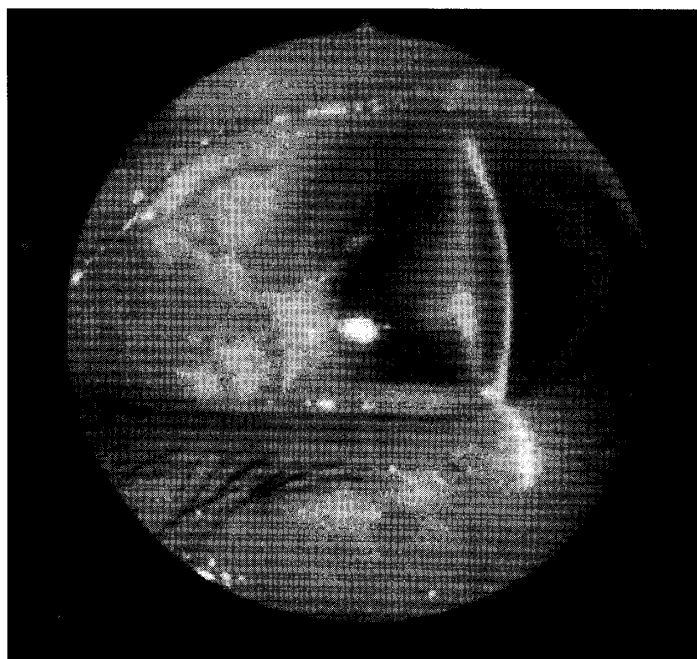


Fig. 1. The finding of outer ocular area at the first ocular examination.

6mm circular capsulorhexis was made. Foldable IOL (Acrysof, Model: 30BA, Power: 21.0D, Alcon Laboratories Inc.) was inserted in the bag and surgery was completed uneventfully. Seven days postoperatively, visual acuity was 0.5 (1.0XC-0.75D, Ax80°) and IOP was 12 mmHg. There were no abnormal findings in the anterior segment or fundus of the eye. The patient suddenly experienced blurred vision and severe ocular pain and was diagnosed with endophthalmitis then referred to the Department of Ophthalmology of Nara Medical University on the following day. At the first ocular examination, visual acuity had decreased to light perception only and IOP was over 50 mmHg. Corneal edema, ciliary injection and hypopyon were identified (Fig. 1). The fundus was not visible and multilobular shadow was detected in the vitreous cavity on B-mode ultrasonic examination (Fig. 2). Broad spectrum antibiotics (Cefozopran Hydrochloride, Firstocin®) were immediately administered and vitrectomy and IOL extraction were performed. After IOL extraction, anterior chamber irrigation and radical vitrectomy were performed. Simultaneously, Vancomycin® (vancomycin hydrochloride), 1.0mg (0.1cc) and Amykacin® (amykacin sulfate), 0.4mg (0.1cc) were injected into the vitreous cavity. During surgery, the retina demonstrated pallor and arteritis was observed. IOP elevation (30mmHg) was observed for 3 days postoperatively. Corneal edema, ciliary injection, hypopyon and educted fibrin in the anterior chamber disappeared and fundus examination became possible. Due to retinal atrophy and desolation, corrected visual acuity was 0.01. From the left eye, there were no viruses isolated. Staphylococcus epidermidis was isolated from the right eye. (External cultures of the eye were obtained by passing a culture swab, moistened with its own transport medium, vigorously over the lower and upper lid margins and conjunctival fornics.) Thereafter,  $\alpha$ -streptococcus was detected from the samples of vitreous body and aqueous humor. (The fluid was inoculated on aerobic and anaerobic sheep's blood, chocolate,

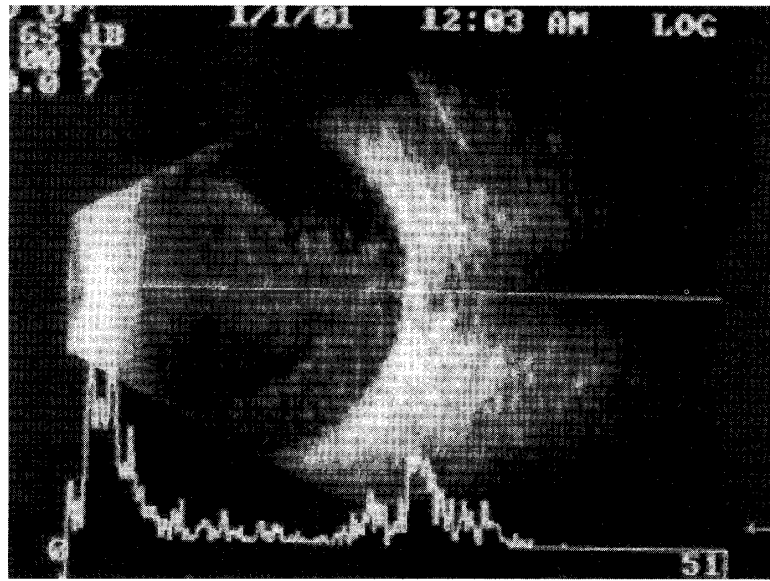


Fig. 2. B-mode ultrasonic examination of vitreous cavity.

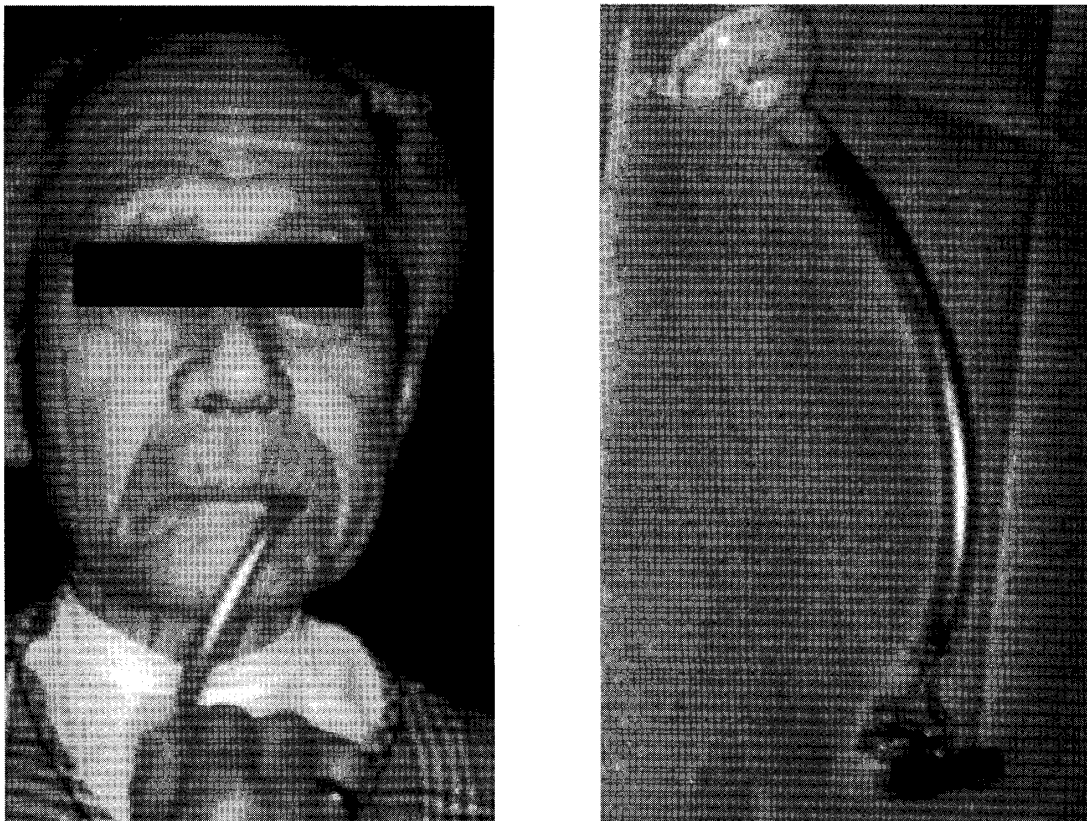


Fig. 3. Right, The state of patient using Tapia for speaking. Left. The figure of Tapia, artificial larynx.

Sabouraud's agar, and thioglycollate broth. Automated identification and antibiotic sensitivity testing were performed on all isolates from external or intraocular sources using a Vitek automated analyzer (Vitek Systems Inc, Hazelwood, MO.) Furthermore,  $\alpha$ -streptococcus was detected from samples taken from the oral cavity and skin of the left

Table 1. Antibiotic sensitivity (S) or resistance(R) of  $\alpha$ -streptococcus from external and intraocular sources

	Antibiotics( $\mu$ g/ml)								
	PCG	CTX	GM	IPM	FMOX	VCM	FOM	MINO	OFLX
Vitreous (aqueous)	S $\leq$ 0.06	S $\leq$ 0.5	R $\geq$ 16	S $\leq$ 0.12	S $\leq$ 2	S $\leq$ 1	S $\leq$ 16	S $\leq$ 0.5	S $\leq$ 2
Left cheek skin	S $\leq$ 0.1	S $\leq$ 0.5	R $\geq$ 16	S $\leq$ 0.25	S $\leq$ 2	S $\leq$ 1	S $\leq$ 8	S $\leq$ 0.25	S $\leq$ 1
Oral cavity	S $\leq$ 0.2	S $\leq$ 0.5	R $\geq$ 32	S $\leq$ 0.2	S $\leq$ 2	S $\leq$ 1	S $\leq$ 8	S $\leq$ 1	S $\leq$ 0.5

PCG : Benzylpenicilin, CTX : Cefotaxine, GM : Gentamicine, IPM : Imipenen, FMOX : Flomox, VCM : Vancomycine, FOM : Fosfomicine, MINO : Minocyclin, OFLX : Ofloxacin

cheek. Bacteriologic characteristics of these samples were similar (Table 1). Based on these findings, we considered that  $\alpha$ -streptococcus was a prophlogistic bacillus in this case. Furthermore, we point out that the patient used an artificial larynx, *Tapia*, daily (Fig. 3).

## DISCUSSION

It is reasonable, when endophthalmitis occurs postoperatively, to assume that a prophlogistic bacillus was present in the anterior chamber at the end of surgery. In papers on microbial contamination of the anterior chamber, Dickey<sup>1)</sup> (1991) reported an incidence of 43%, while Ariyasu<sup>2)</sup> (1993) reported 22%, which are surprisingly high statistics. In subsequent papers, Samad<sup>3)</sup> (1995) reported an incidence of 4.9%, while Hara<sup>4)</sup> (1996) announced positive findings in 1.7% of 58 cases. Sherwood verified that bacteria in the anterior chamber came from the conjunctival sac during the surgery<sup>5)</sup>. Speaker showed that bacteria on the eyelid transferred to the anterior chamber and vitreous body during surgery<sup>6)</sup>.

In this case, there is no denying that bacteria existing in the conjunctival sac or eyelid skin migrated to the anterior chamber during surgery. However, because the conjunctival sac and skin were sterilized preoperatively and bacliculture of conjunctival sac was negative, it is possible that prophlogistic bacillus came from an external source postoperatively. This patient used an artificial larynx, *Tapia*, daily for speech. Discharges from the oral cavity were dissilient to the left upper maxillary bone and left lower eyelid. Moreover, a corneal incision approach was selected. It is reported that one day postoperatively, the external wound is closed but there is a space in the scleral tunnel of auto-closure operation wound<sup>7)</sup>.

If a twisting force applied pressure to the posterior-wound space, a tear extending to the anterior chamber would occur. This possibility would be higher after a corneal incision<sup>8)</sup>. In this case, discharge dispersed from the oral cavity likely passed through the self-closing wound causing the endophthalmitis. Therefore, the bacteria naturally inhabiting the mouth became a relatively rare prophlogistic bacillus. Strictly speaking, genetic analysis is needed to determine the source of the prophlogistic bacillus, but for economic considerations such a test was not pursued. (Definitive proof of the genetic identity of two organisms would require sequencing and comparison of the entire genome, which is not practical.) In this special case, the artificial larynx, *Tapia*, and corneal incision approach became risk factors for infection. It is only natural that day surgery for cataract has become widely performed.

It is necessary to select the surgical method after considering the patient's conditions and to

manage and control the patient's risks.

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