

## Endophthalmitis Caused by *Vibrio alginolyticus*<sup>▽</sup>

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***Vibrio alginolyticus* is a facultative anaerobic gram-negative bacillus found in normal marine flora. Ocular infections induced by *V. alginolyticus* are extremely rare. We report a case of endophthalmitis caused by *V. alginolyticus* to draw attention to *V. alginolyticus* infections following ocular injuries.**

### CASE REPORT

A 26-year-old man was admitted to our department of ophthalmology after a fish hook bounced back and ripped into his left eye while fishing. The entrance of the scleral wound was at the 8:30 o'clock position 6 mm from the limbus. The fish hook had penetrated the sclera by about 3 cm outside the eyeball (Fig. 1). The best-corrected visual acuity (VA) was 20/20 in the right eye and 20/100 in the left. There were no signs of inflammation in the anterior chamber of the left eye. A fundus examination showed a grade I vitreous opacity in the left eye, and the preliminary diagnosis was a vitreous hemorrhage. Surgery was performed immediately to remove the fish hook (Fig. 2). The scleral wound was closed with 5-0 absorbable suture. Scleral buckling and cryopexy were performed to avoid a secondary retinal detachment. A computed tomography scan showed no radio-opaque intraocular foreign body after surgery. Considering that the contaminated fish hook penetrated the eye, 6.0 g of ampicillin was administered intravenously postoperatively to prevent infection and 10 mg dexamethasone to prevent further inflammation. At 8:00 a.m. on the first postoperative day, the VA of the affected eye was 20/150, and no inflammation developed in the anterior chamber. The patient did not report any discomfort. Tobramycin (0.3%) and 0.1% fluorometholone eye drops were instilled topically four times daily. Ampicillin and dexamethasone also were administered intravenously as previously described. Seven hours later on the first postoperative day, the patient complained of progressively blurred vision. The VA decreased to the level of hand movements, along with serious inflammation of the left eye and marked haze of the left vitreous. A fibrinous pupillary membrane formed in the anterior chamber without hypopyon. A diagnosis of posttraumatic endophthalmitis was made. The patient refused an intravitreal antibiotic injection. A 3-mm hypopyon developed within 30 min, and because the inflammation progressed quickly, pars plana lensectomy and vitrectomy were performed immediately. Intraoperatively, we found the lens was opaque and the vitreous cavity was filled with hemorrhages and veils. After cutting off the lens and most of

the exudation, we found extensive full-thickness retinal necrosis, retinal vessel occlusion, and superficial hemorrhages. After clearing the vitreous cavity, we filled 12% of the vitreous cavity with perfluoropropane (C<sub>3</sub>F<sub>8</sub>) after air gas exchange. Three hours postoperatively, the patient was transferred to a tertiary hospital.

Vitreous fluid was collected during vitrectomy and plated onto blood agar. Smooth, convex, creamy colonies became evident within 24 h. On a Gram stain, the isolate was gram negative. The isolate was identified as *Vibrio alginolyticus* by using the Vitek II automated system (bioMérieux, Marcy l'Etoile, France) with a 96% confidence level. Considering the high confidence level, no further identification was needed. Antimicrobial susceptibility determinations were performed automatically by the Vitek system, which generated the MICs shown in Table 1. The Kirby-Bauer agar diffusion method was used as a confirmatory tool. The Clinical and Laboratory Standards Institute (CLSI) guidelines for susceptibility testing of *Vibrio* species were followed.

After the patient was informed of the culture results, he did not return for 3 months. Although finally the infection had been controlled, his VA was at the level of no light perception in the left eye.

**Discussion.** *V. alginolyticus* is a halophilic gram-negative bacterium. The bacterium can multiply in salt water at elevated temperatures. *V. alginolyticus* is one of 12 marine *Vibrio* species identified as pathogenic to humans. The bacterium is associated with wound infections (17, 20, 22, 23), ear infections (1, 4, 5, 6, 22), and gastrointestinal diseases (15). Although rare, deep-seated or invasive infections can develop. Cases of invasive *V. alginolyticus* infections, defined as bloodstream infection or deep-seated or necrotizing soft tissue infection (7, 8, 9), have been reported. The route of these infections is direct contact with contaminated seawater or ingestion of raw seafood, which is the same as that of other *Vibrio* infections.

Ocular infection due to *V. alginolyticus* is extremely rare. *Vibrio* species can cause conjunctivitis, keratitis, and endophthalmitis (3, 10, 14, 18, 19, 21, 24, 25). Endophthalmitis caused by *Vibrio vulnificus* (10, 21), *Vibrio cholerae* (25), and *Vibrio parahaemolyticus* (24) has been reported, but no cases of endophthalmitis resulting from *V. alginolyticus*. Conjunctivitis caused by *V. alginolyticus* also has been reported (14, 18, 19).

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FIG. 1. A fish hook penetrates the sclera by about 3 cm outside the eyeball.

Most reported cases had known exposure to shellfish, seawater, or septicemia. The current patient had an obvious eye trauma due to a fish hook.

Most patients with superficial *V. alginolyticus* infections have a benign course, with responses to only local therapy or no treatment. Cases of invasive *V. alginolyticus* infections can have a disastrous course. In the current case, we observed the development of rapidly blurred vision within a few hours. The eye was damaged despite immediate treatment. Early administration of antibiotics and surgical intervention, if needed, are

critical to control these invasive *Vibrio* infections. If antibiotic therapy is administered, it should be based on the results of in vitro susceptibility testing. As reported, *V. alginolyticus* is resistant to the penicillins and vancomycin; variably sensitive to

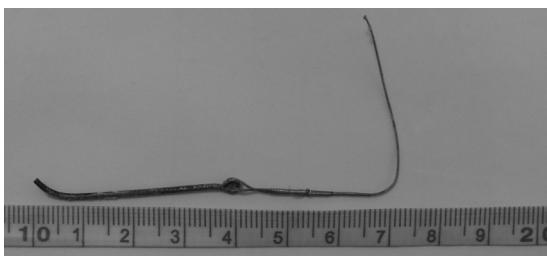


FIG. 2. The fish hook is removed from the eye.

TABLE 1. Disk susceptibilities of the *V. alginolyticus* isolates

Antibiotic	MIC ( $\mu\text{g/ml}$ )	Susceptibility <sup>a</sup>
Ampicillin	$\leq 0.25$	S
Levofloxacin	$\leq 1$	S
Meropenem	$\leq 2$	S
Cefoxitin	$\leq 2$	S
Imipenem	$\leq 4$	S
Cefepime	$\leq 4$	S
Cefuroxime	$\leq 4$	S
Cefotaxime	$\leq 4$	S
Cefoperazone	$\leq 4$	S
Ceftazidime	$\leq 8$	S
Cefazolin	$\leq 8$	S
Piperacillin	$\leq 8$	S
Amikacin	16	S
Gentamicin	$\geq 16$	R

<sup>a</sup> R, resistant; S, susceptible.

ampicillin, erythromycin, cephalothin (cefalotin), and colistin; and sensitive to ciprofloxacin, tetracycline, cefuroxime, chloramphenicol, trimethoprim-sulfamethoxazole, and gentamicin (7, 13, 22). In our test, the organism was susceptible to ampicillin, levofloxacin, meropenem, ceftazidime, imipenem, cefepime, cefuroxime, cefotaxime, cefoperazone, ceftazidime, ceftazolin, piperacillin, and amikacin but resistant to gentamicin.

Penetrating ocular fish hook injuries are a rare yet potentially devastating ocular trauma. Eyelid injuries, corneal injuries, and retina injuries caused by fish hooks have been reported (2, 11, 12, 16, 26). Although most have good prognoses following prompt, appropriate surgical interventions, the patient in the current case had a poor prognosis. The infection and inflammation of our patient progressed too quickly to control.

*V. alginolyticus* is a facultative anaerobic gram-negative bacillus found in normal marine flora. To our knowledge, this is the first case of *V. alginolyticus* endophthalmitis induced by a fish hook reported in the literature. Endophthalmitis due to *V. alginolyticus* should be considered, especially when a fish hook injury is involved.

We have no relevant conflicts of interest.

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