

# A 'SEROUS' FLOATER



A rare case of an ocular parasite requires surgical intervention to confirm the diagnosis.

BY RIVAZ Y. BHIKOO, MBCHB, FRANZCO

A 49-year-old Cambodian man was referred to the Royal Perth Hospital in Perth, Australia, with a 2-day history of right eye pain, photophobia, and floaters. He had no significant ophthalmic or medical history. He had immigrated to Australia in 2004 and last travelled to Cambodia 3 years earlier.

On examination, VA was 20/25 OD and 20/20 OS and IOP was 14 mm Hg OD and 16 mm Hg OS. A low-grade panuveitis with fine keratic precipitates was observed in the right eye with a mobile worm-like opacity present within the inferior vitreous chamber (Figure 1A). A serous macular detachment was also present, and a round, punched-out chorioretinal scar was noted above the superotemporal arcade (Figure 1B). The left eye appeared normal on ophthalmoscopy. OCT imaging demonstrated subretinal fluid (SF) at the maculae (Figure 1C and D).

Fluorescein angiography showed a smokestack pattern of hyperfluorescence in the right macula and a minimally expanding focus of hyperfluorescence in the left macula (Figure 1E and F). Laboratory investigations revealed a mild eosinophilia; however, we could not identify the worm on either stool or serology testing (*Schistosoma*, *Strongyloides*, and *Toxocara* were negative), so we proceeded to a diagnostic and therapeutic vitrectomy.

## SURGERY

This procedure was performed using a three-port 25-gauge system. A small peritomy was fashioned superotemporally, in anticipation that the 25-gauge sclerostomy would need to be extended to remove the intraocular worm. A posterior vitreous detachment was induced, and a core vitrectomy was performed. Attention was then focused on the inferior fundus, and the worm was observed to be tangled within the prominent sheets of the vitreous (Figure 2A).

Significant care was taken to detangle the worm from the vitreous without damaging its structural integrity. The superotemporal sclerostomy was enlarged using a 20-gauge microvitrectomy blade, and end-grasping forceps were used to extract the foreign body (Figure 2B-D). The mechanical manipulation caused a reflex movement by the worm, indicating that it was alive. Laser was applied to the retinal hole that was thought to be the worm's route of entry. An air-fluid exchange was performed to complete the surgery.

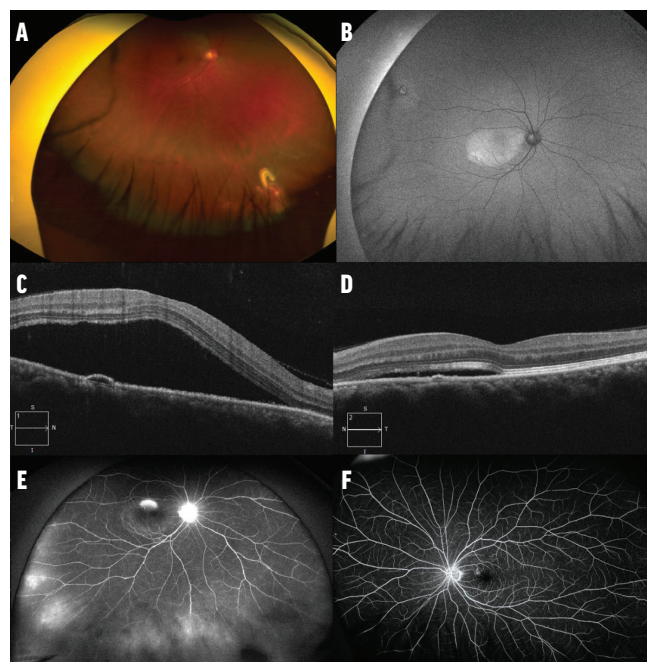


Figure 1. Widefield color photography of the inferior retina showed a yellow S-shaped opacity within the vitreous chamber (A). Fundus autofluorescence revealed hyperautofluorescence at the right macula due to subretinal fluid (B). A round hyperautofluorescent focus with an outer ring of hypoautofluorescence was seen above the superotemporal arcade, which may represent the parasite's entry into the eye. OCT showed a large serous detachment of the right macula (C) with a shallower detachment in the uninflamed left eye (D) with a pigment epithelial detachment in each eye. A widefield fluorescein angiogram of the right eye showed disc and peripheral vascular leakage consistent with intraocular inflammation, and a smokestack pattern of hyperfluorescence was seen at the macula (E). Mild fluorescein leakage was seen at the left macula (F).

## POSTOPERATIVE COURSE

The worm was identified as the third-stage larvae of the roundworm *Gnathostoma (G.) spinigerum* (Figure 3). The patient was reviewed by the Infectious Diseases Service at the Royal Perth Hospital and underwent abdominal and neuroimaging, which came back normal. Despite no evidence of meningoencephalitis, they felt it was appropriate that he receive a 7-day course of oral ivermectin at a dose of 200 mg/kg/day, with concurrent oral prednisone.

The worsening of his serous macula detachments complicated his visual recovery, which resolved after cessation of

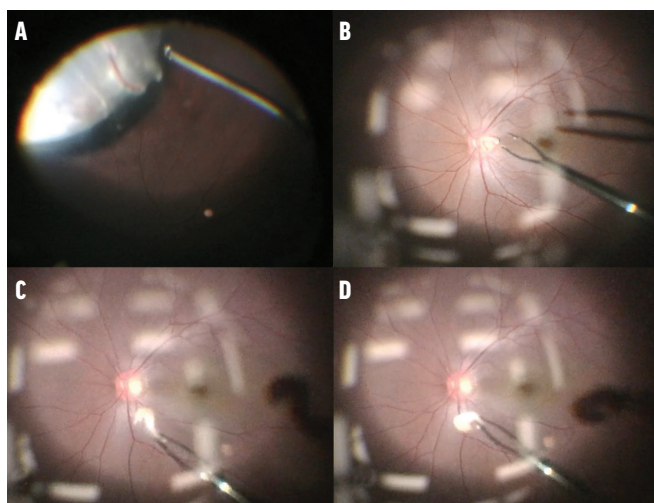


Figure 2. Intraoperatively, the vitrector was used to isolate the worm, which was encapsulated within the inferior vitreous (A). Once separated, the worm drifted posteriorly and settled over the optic nerve (B). End-grasping forceps were used to remove the worm (C and D).

oral and topical steroids. One year after the vitrectomy, the patient underwent routine cataract surgery for the right eye. He achieved unaided VA of 20/25 OD and 20/20 OS, with no recurrence of intraocular inflammation or SF.

## DISCUSSION

Although recognized as an endemic parasitic nematode in Southeast Asia and parts of Latin America, *G. spinigerum* is growing increasingly problematic among travellers. *G. spinigerum* larvae migrate through the gastric wall and can survive inside of humans for up to 12 years, although they do not reach reproductive maturity. The most common manifestation of gnathostomiasis is recurrent migratory swellings under the skin, with involvement of visceral organs and the central nervous system being less common.<sup>1-3</sup>

Definitive diagnosis of gnathostomiasis is only possible by direct identification of the larva; however, this is seldom possible. Therefore, the diagnosis of systemic gnathostomiasis is typically based on the classic triad of a history of ingesting undercooked protein while living in or visiting endemic areas, migratory skin edema, and eosinophilia. Eosinophilia is less commonly reported in cases of ocular gnathostomiasis than in cutaneous or visceral infections.<sup>4,5</sup> Serology testing using enzyme-linked immunosorbent assay or immunoblot for IgG detection of *G. spinigerum* has reported sensitivity of 47% to 100% and specificity of 70% to 100%. However, such testing is not available in the United States, and traditionally, samples have been sent to specific international laboratories in Japan and Thailand (more details available through the Centers for Disease Control and Prevention).<sup>6</sup>

The route by which this parasite enters the eye remains unclear. More than 80 cases of ocular gnathostomiasis have been reported in the literature, with the majority involving

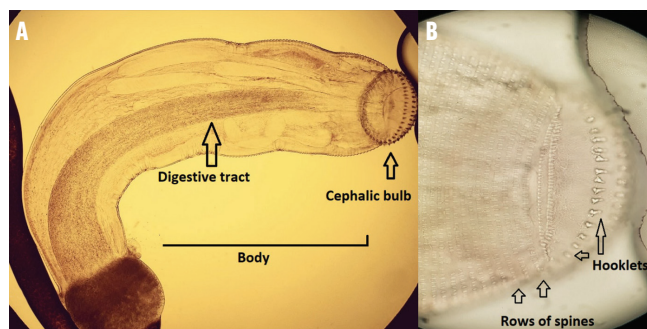


Figure 3. Scanning electron microscopy showed a third-stage larva with a prominent bulb, body, and digestive tract (A). The head of the worm contains hooklets and a grinding apparatus that is reminiscent of a tunnel drill machine (B).

the anterior segment.<sup>4,5</sup> Vitreoretinal involvement has also been reported and manifests as diffuse unilateral subacute neuroretinitis. Although serous retinal detachments are associated with several uveitic diseases, the findings in this case were more typical of central serous chorioretinopathy; the worsening of the serous detachments with commencement of high-dose oral steroids supports this diagnosis.

Given the rarity of such ocular parasitic cases, there is no consensus on the treatment approach.<sup>1,4,5</sup> Albendazole (Albenza, IMPAX Labs) or ivermectin are commonly prescribed when other organ systems are involved, but they are not considered to be the most effective treatments in ocular cases. Periocular or systemic steroids are used to manage inflammatory sequelae. Some have found laser photocoagulation to be effective, but the most definitive treatment and method of diagnosis is surgical extraction; however, due to the parasite's mobility, this may not always be feasible.

## A POSITIVE OUTCOME

The case presented here is an example of positive visual recovery following treatment of ocular gnathostomiasis. Patients traveling to endemic areas should be reminded to avoid raw or undercooked protein and to ensure the food they consume has been handled safely. ■

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