CASE REPORTS

In-toto removal of a subretinal *Cysticercus cellulosae* by pars plana vitrectomy

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Abstract

A case of subretinal cysticercosis was treated with laser coagulations round the cyst prior to surgery. In-toto removal of the living cysticercus was performed by pars plana vitrectomy. Two weeks after surgery 25/20 vision was regained. Histopathology of the cyst confirmed the clinical diagnosis.

Ocular cysticercosis occurs rarely, but the diagnosis is very important. In most cases untreated intraocular cysticercosis will eventually lead to blindness.^{1,2}

The cysticercus is generally found subretinally, but any area of the eye or ocular adnexa may be affected.¹⁻⁴ It enters the posterior segment of the eye through the posterior ciliary arteries, reaching the subretinal space. From there the parasite may migrate into the vitreous cavity.

Case report

A 44-year-old male visited our clinic in January 1990 with a red, irritated left eye and complaints of blurred vision for two months. He had travelled to Indonesia in the summer of 1989.

The visual acuity of the right eye was 25/20. It was entirely normal. On the left the visual acuity was 20/30, motility was normal, and the intraocular pressure was 14 mm Hg. Slit-lamp examination showed a mild conjunctival injection; the anterior chamber had 2+ cells and flare, and the

Figure 2 Fundus photograph two months postoperatively. The optic media are clear and the retina is fully attached.

vitreous cavity had 1+ cells. Funduscopy disclosed a subretinal, translucent cyst, 4 disc diameters in size in the superonasal quadrant. A central dense white spot, mobile under bright illumination, indicated the location of the larva inside the cyst (Fig 1). The optic nerve head, macula, and retinal vessels showed no abnormalities.

Preoperative standardised A-scan ultrasonography revealed two medium to high amplitude echos, indicating a space between the inner cyst wall and the overlying retina. The B-scan showed a subretinal bladderworm with two hooklets.

A general physical and neurological examination gave normal results. The white blood count was normal except for 5% eosinophils. Enzyme linked immunosorbent assay (ELISA) gave positive results for *Taenia solium*/*Cysticercus cellulosae* immunoglobulins (1:80). Stool specimens, a skull x-ray, CT brain scan, and cerebrospinal fluid were normal. There was no evidence of generalised cysticercosis.

Two weeks prior to surgery the subretinal cyst was sealed by surrounding argon laser photocoagulations (wavelength 577 nm, spot size 250 µm, 200 ms, 0.2-0.35 W) (Figs 1 and 2). Systemic prednisone was administered one day preoperatively until one day postoperatively.

An initial attempt to remove the cysticercus by sclerotomy was abandoned because of the location of the cyst underneath a vortex vein. A pars plana vitrectomy was therefore performed. Endodiathermy of the raised retina overlying the

Figure 1 Fundus photograph showing the subretinal cysticercus. The laser coagulations surrounding the cyst are vaguely discernible.

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Accepted for publication
21 February 1991

Figure 3 Histological section of the cyst. (Haematoxylin-eosin, $\times 30$.)

cyst allowed a safe retinotomy. The cyst was pulled into the vitreous and extracted from the eye in one piece after enlargement of the pars plana incision.

Two weeks postoperatively visual acuity was 25/20 in the left eye, the optic media were clear, the retina was fully attached, and the intraocular inflammation had subsided (Fig 2).

Macroscopic and histological examination confirmed the diagnosis. Within a 3 mm cyst a *Cysticercus cellulosae* larva was found, with several hooks and suckers, conforming to the characteristics of the *Taenia solium* scolex (Figs 3, 4).

Discussion

Cysticercus cellulosae is the larval stage of *Taenia solium*, the swine tapeworm. Human cysticerco-

Figure 4 Histological section of the scolex within the cyst. Note the two characteristic hooks (arrows). (Haematoxylin-eosin, $\times 420$.)

sis can be acquired when man ingests the eggs of *T. solium*. An intraocular living cysticercus will initiate a foreign body reaction, varying from a mild uveitis to a panophthalmitis. When the parasite is left untreated it will eventually die after two to four years. The accompanying release of toxins induces an inflammatory reaction that may lead to destruction of the eye, though there are exceptions.^{1,2,5} Early removal of the cyst is crucial.

The management of subretinal cysticercosis has taken various forms. Anthelmintic drugs, such as praziquantel, are ineffective for intraocular cysticercosis.^{6,7}

Xenon and argon laser photocoagulation have been reported to be an efficacious treatment of small subretinal cysticerci (less than 8 mm).^{8,9} Coagulation has the undesired side effect that the dead larva is left inside the eye.¹⁰ Systemic and topical steroids have been reported to suppress the subsequent inflammatory reaction.^{1,2,11}

The most effective method of preserving function in an eye with intraocular cysticercosis is surgical removal of the larva. Subretinal parasites can be removed through a sclerotomy.¹¹⁻¹⁸ But this technique carries some risks. Extensive periocular surgery may be required to gain adequate exposure.^{1,2,12,19} Inadequate localisation may lead to non-removal of the parasite. Perioperative migration of the cyst within the subretinal space and migration into the vitreous have been described.^{1-3,13,14} Other possible complications are retinal detachment, retinal tear with vitreous loss, vitreous haemorrhage, and bacterial endophthalmitis.

Vitrectomy has been used to remove intra-vitreous cysticerci.^{3,11,13-15,20-22} Steinmetz *et al* reported the successful removal of a subretinal cysticercus after fragmentation of the cyst inside the vitreous cavity, using pars plana vitrectomy.²³ This method has several advantages over a classic sclerotomy. The visibility of the parasite during surgery is excellent and the risk of subtotal cyst removal and choroidal bleeding, as in the external approach, is avoided. The risks of a retinotomy can be minimised by preoperative application of delimiting laser photocoagulations (Fig 2). This also prevents perioperative cyst migration within the subretinal space.⁸

The risk of spilling cyst contents is minimal if cutting or aspiration of the cyst can be avoided, as in our case. The presence of a space between the cysticercus and the overlying retina, as demonstrated by our preoperative A-scan ultrasonography, suggests the possibility of removing the cyst in toto.

Intraocular cysts formed by other parasites, such as *Echinococcus* and *Taenia saginata*, are extremely rare and can only be differentiated from *Cysticercus cellulosae* by histopathology.^{1,15,24}

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