CASE REPORTS

Intraocular coenurosis: a case report

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Abstract

A case of intraocular coenurosis was clinically diagnosed and treated with praziquantel. The drug destroyed the coenurus, but vision was lost through toxic endophthalmitis and retinal detachment. There were no systemic side effects.

Coenurosis is an infection by the cestode larva, the coenurus, which Wardle and McLeod¹ described as a bladder worm with multiple scolices. The particular taeniid species producing the coenuri in man is still controversial, but most accounts of human coenurosis describe the infections as due to the larval forms of *Taenia multiceps*, *T. serialis*, or *T. brauni*. The adult worms are found in the intestines of carnivorous animals – dog, wolf, fox – while the larvae are usually found in herbivores – sheep, goat, cattle – when these ingest infective eggs expelled from the canines.²

Man is a susceptible intermediate host of any of the taeniid species. The oncospheres hatch in the intestine of the intermediate host, penetrate the intestinal wall to reach the blood stream and from there are distributed into various tissues, commonly the central nervous system, the eye, and subcutaneous and intermuscular tissues, where they develop into coenuri.

Most reports on coenurus infections of the eye and adnexa in tropical Africa have come from Uganda, Kenya, and Ghana.^{3,4} Two cases have also been reported from South Africa.^{5,6} Turner and Leiper⁷ first described a human intercostal muscle infection in Northern Nigeria. A case of triceps muscle infection has also been reported from the Northern Nigeria.² We here report a new case of clinically diagnosed intravitreal coenurosis in a 25-year-old Nigerian. Details of the clinical course and result of treatment with the schistosomicide, praziquantel, are discussed.

Case report

A 25-year-old man was referred on 21 September 1987 because of a one-week history of painful redness and blurring of vision in the right eye. His visual acuity was RE 6/9 and LE 6/5 (Snellen's). The right eye showed a tender injection of the temporal sclera with anterior uveitis. He was considered to have scleritis and treated accordingly.

Two months later he reported with further deterioration in vision in the same eye. He also complained of seeing shadows of objects lining

up on the surface of a balloon and then sinking back towards its centre. His visual acuity had gone down to counting fingers at 1 metre. A detailed funduscopy revealed a transparent intravitreal cyst located on the temporal side of the retina (corresponding to the area of scleritis) from 7 to 11 o'clock and involving the macula. On the surface of the cyst several white spots were scattered in no definite pattern. There was marked vitreous cellular reaction, but the underlying retina and its vessels were normal. Slit-lamp biomicroscopy showed scolices protruding from the white masses and making pendulum-like excursions in the overlying vitreous. Suckers were clearly visible on most of the scolices. On other occasions the scolices were not visible, having retracted into the white masses. An intravitreal cestode cystic larva with multiple scolices, a coenurus, was suspected.

Investigation into the patient's social history showed that he was a muslim from Plateau State of Nigeria. He never had anything to do with pork or bush meat on religious grounds. He had worked in an agricultural ministry for four years before changing to a mining corporation in Kano State in 1985, and here he had lived in a house with three local dogs.

General examination showed no nodules on any part of the body. The haemoglobin value was 15.5 g/l, leucocyte count $6 \times 10^9/l$ (neutrophils 45%, lymphocytes 50%, monocytes 2%, and eosinophils 3%). The platelet count was $160 \times 10^9/l$. Stool examination showed no evidence of parasitic infection. There were no cells in the aqueous humour.

TREATMENT

The patient was treated with topical steroids, and on 5 February 1988 praziquantel was begun at a daily single dose of 25 mg/kg body weight orally for four days. He also received prednisolone tablets, 10 mg three times daily during the same period.

Ten days later he complained of severe pain and redness in the right eye, noting that the balloon he used to see had become smaller; it then disappeared. Funduscopy showed that the cyst had ruptured, with the nasal wall floating in the vitreous. Only a few of the white masses were seen lying on the temporal retina, while some white debris lay on the inferior retina. The vitreous was cloudy and visual acuity was hand movements.

Despite a repeat of the course of praziquantel and prednisolone, the patient went on to develop

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endophthalmitis. For this he received three daily doses of periocular dexamethasone injections 4 mg each and was maintained on topical and systemic steroids. When the intraocular inflammation settled, fundoscopy showed a totally detached retina with extensive pre and subretinal fibrosis.

During the remainder of 1988 and throughout 1989 the eye had only occasional flare-ups of intraocular inflammation, which were controlled with steroids. He was last seen on 12 January 1990. Visual acuity was light perception. The eye was comfortable and quiet but the retina remained totally detached, with some white debris scattered on it. The intraocular pressure was normal.

Discussion

Although only a few cases of intermuscular and no case of coenurosis of the eye have been reported from Nigeria, there is reason to believe that the infection may be commoner than it seems. This is because in this area where animal faecal wastes (dogs inclusive) are deposited indiscriminately in the environment, soil pollution is a big problem, and helminth larvae and ova easily contaminate fresh vegetables and other foods consumed raw.⁸ In seven of the 13 cases detailed by Williams and Templeton³ the infection was intraocular, and the coenurus, as in our case, was in the vitreous. All but one of the patients were adults. Those authors believed that the most likely route of infection in the intraocular and adult cases is the mouth, and is due to eating fresh food contaminated by eggs expelled by the animals (definitive hosts).

As suggested by Kruger-Leite *et al*⁹ in the case of intraocular cysticercosis, the larva enters the eye by the posterior ciliary arteries, rests in the subretinal space, and then perforates the retina to reach the vitreous cavity. Most African coenurus infections in children have involved the subconjunctival or subcutaneous tissues. In these cases the larva is inoculated directly into the conjunctiva and skin early in toddler life when these organs are frequently close to contaminated grounds.³

When the coenurus is intraocular, the main cause of symptoms appears to be a toxic reaction in contrast to the space-occupying and pressure effects of the coenurus in the central nervous system and in intermuscular and subcutaneous tissues. The development and progress of intraocular inflammation in our case supports this theory of toxic reaction. Toxins released by the cyst induced the iritis and vitritis observed during the initial examination. Following the course of praziquantel, there was disintegration of the cyst and death of the larva. The large dose of toxins so liberated gave rise to the endophthalmitis and loss of vision. The steroids helped contain the intraocular inflammation, though retinal detachment and fibrosis went on to develop.

The best treatment for an intravitreal cestode cystic larva is its removal through a closed vitrectomy.⁹ This should be carried out whenever

possible and as soon as possible. The cyst should be removed while it is still living,¹⁰ because its death leads to the release of large amounts of toxins and severe intraocular inflammation.

We did not have the facilities for closed vitrectomy, and since scleral dissection would not be the best approach for removal of an intravitreal cyst we decided on medical therapy. We chose praziquantel, a schistosomicide, that has proved effective in destroying cysticerci, including those in the brain and with minimal side effects.^{11,12} The drug was easily available at an affordable price. It did prove effective in destroying the coenurus, but the attendant toxic endophthalmitis led to visual loss despite adjuvant systemic steroids. No systemic side effects due to the drug were reported.

Toxic endophthalmitis with its sequelae is the principal mechanism of visual loss when the coenurus is intraocular, but coenurosis can impair vision in other ways. An intracranial coenurus involving the ventricular system will lead to symptoms and signs of raised intracranial pressure, including papilloedema. If prolonged, pressure necrosis and visual impairment will ensue. Chiasmal interference or localisation in the cerebral hemispheres will lead to characteristic visual field defects.

Determination of the particular species to which a coenurus in human infection belongs has been described by Beaver *et al*² as difficult, confusing, and at times practically impossible. All the taeniid species that produce coenuri as larvae have the dog as one of the definitive hosts, but they differ in their intermediate host preferences. Our patient had in the recent past worked in agricultural ministry and lived in a house with three local dogs. He was probably infected by taking food or drink contaminated by eggs of worms expelled by the dogs. All the coenurus infections of the eye in tropical and South Africa are said to have conformed to the species *Taenia brauni*.^{3,4} In this species the scolices, as in our present case, are distributed haphazardly on the cyst. It is probable that this is another intraocular infection by coenurus of *T. brauni*.

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