OPHTHALMOMYIASIS INTERNA CAUSED BY *CUTEREBRA* LARVA*

BY *Joseph M. Dixon*, M.D., AND (BY INVITATION)
Charles H. Winkler, PH.D., AND (BY INVITATION)
John H. Nelson, M.D.

THE PRESENCE OF THE COMMON RABBIT OR RODENT FLY LARVA in the anterior chamber, reported in this communication, is apparently the first case of human ocular infestation with *Cuterebra* larva to be recorded. Invasion of the normal human eye by any species of maggot is rare. Thirty years ago O'Brien and Allen[1] reported the first case in the Americas of a maggot in the anterior chamber. The larva belonged to the genus *Hypoderma*, the botfly of sheep, cattle, and deer.

Beachley and Bishopp[2] reported the only previous case of parasitism by *Cuterebra* larva in man. In their case a woman, working in the yard, suddenly felt a sharp sting in her right nostril. Over the next ten days acute pain developed in the right side of her face, shoulders, and back. The following day a fully developed, first-stage larva of *Cuterebra* was sneezed out.

Our patient, a 45-year-old housewife, noticed blurred vision in the left eye on 28 May 1967. The following day the eye was red and painful. Pain was also present in the left side of the head, temple, and cheekbone, with swelling around the eye and side of the nose. She described the pain as unbearable and consulted her local physician, who gave her injections for pain and allergy.

The ophthalmologist who was consulted found uveitis with cloudy vitreous, and a discolored optic disk. Two weeks after the onset of symptoms, one of us saw her and found heavy aqueous flare, with cells in the anterior chamber and vitreous. Corrected vision was 20/20, right eye, and counting fingers, left eye. Corticosteroids and atropine drops were used locally.

*From the Department of Ophthalmology and the Department of Microbiology, Medical Center, University of Alabama in Birmingham, Birmingham, Alabama.

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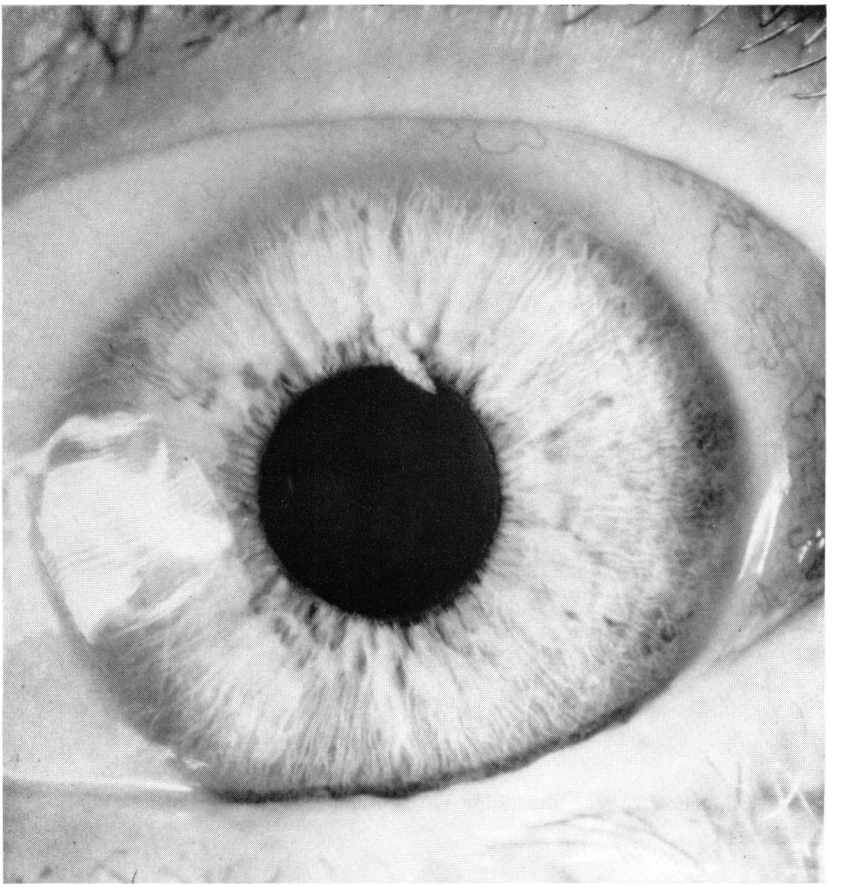

FIGURE 1
Fly larva: Anterior portion protruding through iris.

The uveitis subsided and on 7 July, forty days after the onset of symptoms, a small fly larva was observed resting partly through the iris (Figure 1). It did not move and was presumed to be dead. The corrected vision was 20/20, right eye, and 20/60, left eye. A small hemorrhage was in the iris stroma temporally, and there were four scattered holes in the iris pigment epithelium. The media were clear, but the fundus had numerous winding trails consisting of clumps of pigmented and depigmented areas. The trails had the appearance of paths made by the migrating larva in either the choroid or the subretinal space (Figure 2).

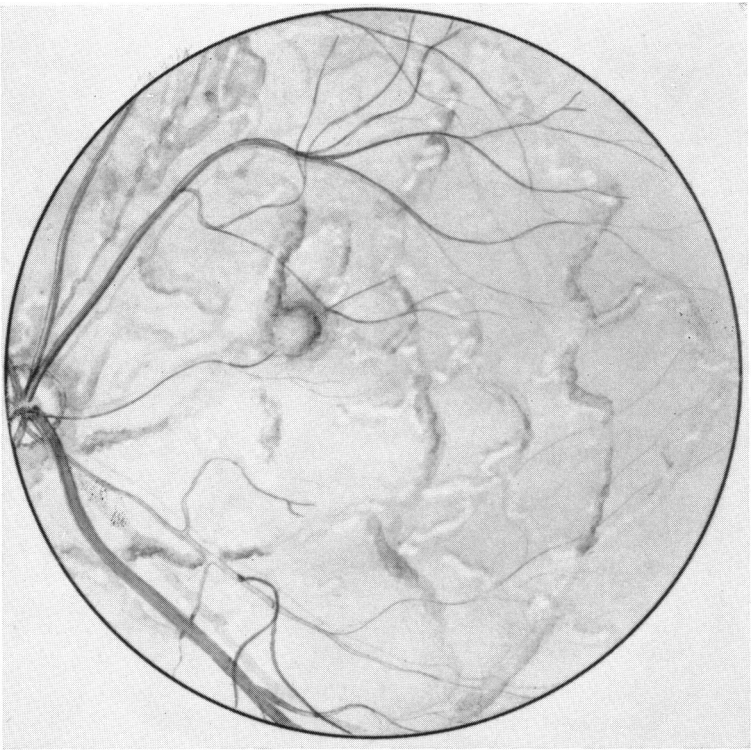

FIGURE 2
Sketch of fundus illustrating larval migratory pathways observed.

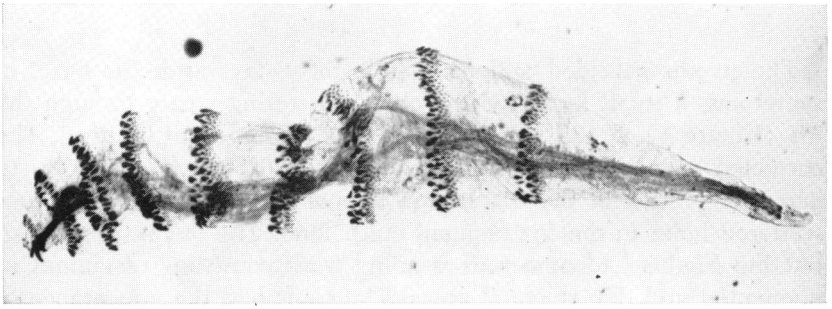

FIGURE 3
Fly larva removed from the iris. (× 40)

The larva, about 3 mm in length, was removed the following day by iridectomy. It was identified by Mr. Curtis W. Sabrosky of the Entomology Research Division, U.S. Department of Agriculture, as a first instar larva of a member of the genus *Cuterebra* (Figure 3).

The patient was last seen in December 1968, six months after the onset of this episode. Corrected vision was 20/40 in the left eye. The fundus appeared unchanged.

The natural history of infection with larvae of *Cuterebra* in their normal animal hosts is not well known.[3] The female fly need not deposit her eggs directly on the host. Eggs may be laid on vegetation or other debris near an animal run or nest. The first-stage larvae that hatch from the eggs may enter the animal host by direct penetration through the skin, by ingestion, or by migration into a nostril and penetration therein.

According to Duke-Elder,[4] in human infection larvae are deposited on the skin near the eye from a person's hands and enter the eye by direct penetration. He further states that they penetrate rapidly without being noticed.

The circumstances of infection in the patient here reported are not known. She lived in a farming area near Moundville, Alabama. There was no known contact with rabbits, ground squirrels, or other wild animals.

SUMMARY

A case of ophthalmomyiasis interna caused by a member of the genus *Cuterebra* is recorded.

REFERENCES

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2. Beachley, R. G., and F. C. Bishopp, Report of a case of nasal myasis due to a botfly larva (Cuterbra sp.), Virginia M. Month., 69:41–2, 1942.
3. Ignoffo, C. M., Biology of *Cuterebra jellisoni* (Diptera: Cuterebridae) on *Lepus californicus deserticola* (Lagomorpha: Leporidae), Ann. Ent. Soc. Am., 54:509, 1961.
4. Duke-Elder, W. S., System of Ophthalmology, vol. 9, St. Louis: C. V. Mosby, 1966, p. 490.

DISCUSSION

DR. TULLOS O. COSTON. One more parasite has now been added to the list of those affecting the eye of the human race. I have counted about 39 varieties, not many of these having been reported as being intraocular.

The authors are to be congratulated first in being able to remove this maggot intact and preserving it in such a way that it could be definitely

identified. I would say that from the work that has been done in the past and from the experiences of others, it is my impression that these maggots, and certainly the maggot that is so common in cattle (screw worm) and various Filaria can bore directly into and through the coats of the eye.

I think we can suspect an intraocular parasite often if we will think about the tracks that we see in the fundus that really could have no other explanation except having been made by a motile organism. And, of course, one observer has seen a larva while looking in the eye with an ophthalmascope, has seen it crawl out into the vitreous from the edge of the nerve head, so we do have this evidence and we do know that that is one way they come into the fundus.

A 17-year-old patient came in with an inflammatory lesion at the macula. A photograph was taken a month after she was first seen, because we became interested immediately in a track that led off from this central lesion. The track went upward and then to the periphery. Then it became a double track leading to another area of inflammation. These were not present at the first examination of the eye; only the central lesion was visible then. On looking at the photograph closely, you can see that this is a subretinal parting of pigment. It does not appear to be inflammatory in nature. Something crawled along there.

A 7-year-old boy had a lesion, from the appearance of which anyone could postulate that an organism climbed out at the edge of the nerve head, stayed until this inflammatory mass set up, and maybe went back again. We know that these larva live for years. I would have no doubt but that this is exactly what hapened.

The other point to be made is that these organisms set up an inflammatory reaction whether they are dead or not. In some instances they set up antibodies. These organisms are what we now call *Toxocara*, without really knowing for sure. At least we are not enucleating these eyes now.

Some interesting work at Oklahoma Medical Center has been done after infecting baboons with *Toxocara canis*. A satisfactory antigen was prepared by using *Toxocara* larvae. In the past, the antigens have been prepared from mature *Toxocara* worms and it does not work under those circumstances, but high agglutination titers have been obtained in these baboons beginning within a week after the infection and continuing for a number of weeks and months. I look forward to the application of this as a helpful confirmatory test in cases of suspected human infestation.

Dr. Frederick C. Blodi. I have a follow-up on the patient from Iowa that Dr. Dixon alluded to. This boy was reported by O'Brien and Allen. At that time the boy was 7 years old and lived on a farm. The maggot was removed by paracentesis. He did fairly well with this eye for a certain period of time, but then he developed iritis and secondary glaucoma; he lost his vision, but did not lose his eye. When he was 28, he had a severe car accident and had

a skull fracture on the side of his healthy eye. The optic nerve was severed and he is now blind in both eyes.

DR. CHARLES H. WINKLER. In July or August, three out of four ground squirrels in this particular area will have maggots of *Cuterebra* within them, but this is a common state of affairs in a great number of animals. Of course, myiasis is a part of the natural history of those animals that are hosts to these flesh flies. The adult maggots do not feed. They lay eggs on the host, on the runs to the nest or the burrow, or sometimes on grasses in the neighbourhood of the host. The larvae hatch and get onto the animal, if the eggs are not laid on the hair of the animal. They are little less than a millimeter in length, perhaps three-tenths of a millimeter in diameter. They may penetrate the skin directly, or go in through the mouth and penetrate the mucosa. In about 19 days, they have molted three times and are about an inch in length. Then, they drop to the ground and pupate. After a variable period of time, from 60 to 200 days, depending upon the time of the year, the adult emerges from this pupa.

This particular larva was the first larva of a member of the genus *Cutereba*. It was having a hard time, as you would expect, since it was not in its normal host. That is why it was small. In its normal host, it would have grown to an inch in length and here it was only about 3 mm in length 40 days after the onset of symptoms. The larva was dead when it was extracted.

Dr. Dixon asked the question, how did the larva get there? I won't be able to answer that but let me mention this. They have some exciting ways of getting where they are going. The human botfly plagues many areas of Latin America. The females capture insects that feed on warm-blooded animals, including man. For instance, the female captures a mosquito and lays her eggs on the abdomen of the mosquito. When the mosquito then feeds on a warm-blooded animal, including man, the larvae hatch and drop down to enter the skin.

The *Cuterebra* are much more direct in their approach. We have indicated that the larvae may hatch. They are not ingested. Duke Elder suggests that the larva gets on the hand and in this manner is transferred to the vicinity of the eye and penetrates quite painlessly.