

INTESTINAL CANTHARIASIS DUE TO *TENEBRIO MOLITOR*

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Canthariasis (Osler's "scoleciasis"), or accidental parasitism by coleopteran (beetle) larvae in man, is a rather rare and poorly known entity. The disease is to be distinguished from myiasis and scholeciasis, infection by dipteran (fly) and lepidopteran (moth) larvae, respectively. The rôle played by several species of beetle larvae as intermediate hosts for the tapeworm *Hymenolepis diminuta* has aroused more interest than the primary larval infection itself. That canthariasis can be a disturbing and persistent illness is illustrated by the case herein reported.

Beetle larvae have been recovered from several parts of the human body. Hinman and Faust (1932), who have summarized the early literature on the subject, report a case of infection of the tonsils by *Tenebrio molitor* larvae, discovered at tonsillectomy. Three centuries ago Tulpius (1652) told of the recovery of beetle larvae from a patient's nose and from another patient's urinary bladder. Bateman (1811) added a case of infection of the umbilicus.

The gastrointestinal tract, however, is the usual habitat of parasitizing beetle larvae (Brumpt, 1927; Hinman and Faust, 1932). Senior-White (1920) reports that in India intestinal infection with larvae of *Onthophagus bifasciatus* (SCARABEIDAE) is common enough to have a vernacular name. Nevertheless the phenomenon of canthariasis is accidental, there being no obligate coleopteran parasite of man. Beetle larvae in the bowel are in a wholly unnatural environment, and, although they can continue to thrive and develop here temporarily, they must eventually be passed out. Since pedogenesis is not known to occur in these beetle larvae, there is probably no multiplication within the bowel.

Although several species are involved, the beetle usually responsible for gastrointestinal canthariasis is *Tenebrio molitor*, the dark mealworm, which is commonly found in grains, milled cereals, flour, bran, meals, bread, and meat scrap. The life cycle is completed in one year in this medium (Cotton, 1940), and any stage may be accidentally ingested. Although beetle larvae are considerably more resistant to deleterious influences than are larvae of other types of food-infesting insects, it must be assumed that the usual cereal cooking processes regularly kill them. The danger lies in breakfast foods and precooked cereals.

It is uncertain whether gastrointestinal canthariasis ordinarily follows the ingestion of the insects in the egg or in the larval form. Senior-White (l.c.) makes the statement, "It is probable that whilst in the intestine the larvae are faecal feeders, but how, and at what stage, they get there . . . is unknown." It seems likely that unmastrated larvae may survive, to be passed eventually by rectum. That late-stage larvae can be present as high in the gastrointestinal tract as the stomach without any known method of maintaining their position there while developing from the egg, is well known from vomitus and post-mortem examinations (Pickells, 1824; Riley and Howard, 1889). On the other hand, when infants pass large numbers of larvae, as in the case here presented, the phenomenon is best explained by the previous ingestion of eggs.

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\* 1st Lt., M.C., AUS. The case history is that of a patient of Dr. Paul Beaven of Rochester, N. Y., who was kind enough to bring the case to the writer's attention and to allow its publication. Specific identification of the beetle larvae was confirmed by Dr. Wm. H. Anderson of the U. S. Bureau of Entomology and Plant Quarantine, to whom grateful appreciation is extended.

Knowledge of the pathology and clinical picture of intestinal canthariasis is limited. There is no evidence to suggest that the larvae become attached to the bowel wall or that they damage it in any way. Melena has not been reported. Although minor symptoms referable to any part of the gastrointestinal tract occur, evidence that disease exists is often first discovered when larvae are noticed in the stool.

Eradication of the infection is a difficult matter. Because canthariasis is rare in this country and because the infection is eventually self-limited, it is difficult to evaluate therapeutic agents. Purges and enemas are prescribed without confidence. Hexylresorcinol is probably the drug of choice, and, because of the notable lack of harmful side effects, the crystoids may always be given a trial, regardless of the patient's age.

#### CASE REPORT

The patient, an 8-month-old 18-lb. white boy, was born spontaneously at term weighing 4 lb. 14 oz. He was never breast-fed and was started on precooked cereals at 3 weeks. Now at 8 months he is given pureed soups, vegetables, cereals, and fruits. There have been no previous illnesses. The sibling has always been well and has passed no larvae to the mother's knowledge.

The patient was well until the age of 4 months when he began to vomit frequently between feedings. At 5 months the infant passed a "white worm about an inch long" by rectum. At intervals during the next three months the patient passed several more "worms," all of which looked alike to the mother. Six were recovered; each measured 2.4 cm in length and was identified as a larva of *Tenebrio molitor*. All of the larvae were active when passed, and two were alive at the end of two weeks in a dry air-tight jar.

During this period the infant continued to gain weight. However, he took his feedings poorly, vomited frequently, had long crying spells, and seemed to have "colic" to his mother's eyes. There was no diarrhea or gross melena. No larvae were vomited. The infant was given frequent soapsuds enemas and several doses of Castoria, without the elimination of any larvae or the improvement of the patient's signs. Larvae were still being passed three months after the appearance of the first.

After the epidemiology of the infection had been explained to the mother, she made a search for beetles in the dry foods in her kitchen. Adult coleopterans were found in a box of precooked cereal. These adults were keyed out to the TENEBRIONIDAE but were lost before specific identification could be made. Subsequently additional beetles have been found in freshly opened boxes of this brand of precooked cereal.

#### COMMENT

Because of the age of the patient and the long period over which larvae were passed, it is assumed that infection in this case was initiated by the ingestion of the beetle in the egg stage. The recovery of adult tenebrionid beetles from boxes of the infant's precooked cereal clarified the epidemiology. The ineffectiveness of purges and enemas was demonstrated in this case.

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