

# Finding of *Enterobius vermicularis* on prostate biopsy: a case report

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**Background:** The pinworm, *Enterobius vermicularis*, usually inhabits the human lower gastrointestinal tract, but aberrant sites of infestation have been described. We report on a rare finding of *E. vermicularis* in the prostate, which is, as far as we could establish, only the fifth reported case in the English literature.

**Case presentation:** We report a case of a 60-year-old man who presented with lower urinary tract symptoms, macroscopic haematuria, culture-negative pyuria, and a raised prostate-specific antigen (PSA) level. A subsequent core needle biopsy revealed an *E. vermicularis* worm in the prostate. This is an extremely rare manifestation, as pinworm is very rarely found in the male genital tract. The proposed route of infection in this case was ascending migration via the urethra to the prostate; however, artificial inoculation by the biopsy needle cannot be excluded.

**Conclusion:** *E. vermicularis* can very rarely enter the male urogenital tract where it may potentially cause lower urinary tract symptoms, haematuria, and pyuria that is often culture-negative. The diagnosis is usually unsuspected because of its rarity.

**Keywords:** prostate, biopsy, *Enterobius vermicularis*, enterobiasis, pinworm

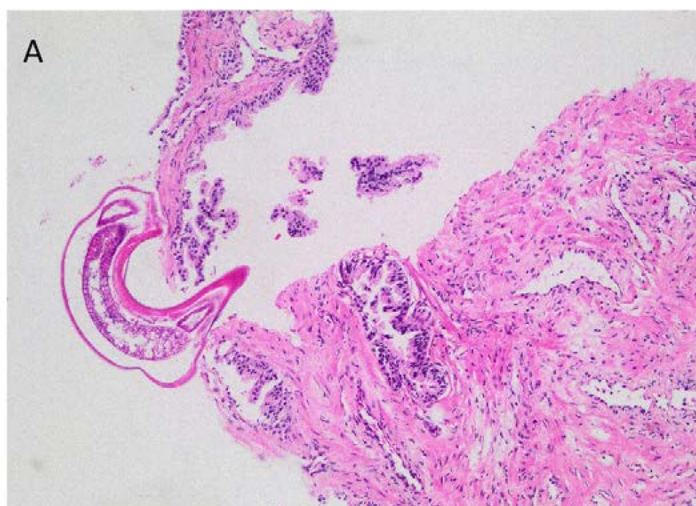
## Introduction

The pinworm, *E. vermicularis*, usually inhabits the human lower gastrointestinal tract, but aberrant sites of infestation have been described. We report a case of a 60-year-old man who presented with lower urinary tract symptoms, macroscopic haematuria, culture-negative pyuria, and a raised prostate-specific antigen (PSA) level. A subsequent core needle biopsy revealed an *E. vermicularis* worm in the prostate. This is an extremely rare manifestation as pinworm is very rarely found in the male genital tract. We report on a rare finding of *E. vermicularis* in the prostate, which is, as far as we could establish, only the fifth reported case in the English literature.

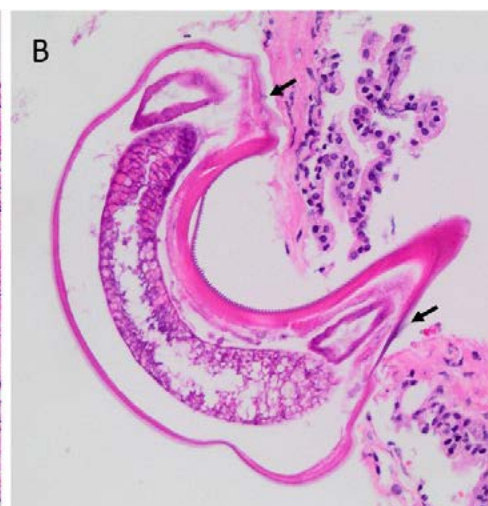
## Case report

A 60-year-old man presented to the Urology Outpatient Department of a tertiary centre for a work-up of his lower urinary tract symptoms and an elevated PSA level (22.19 µg/L). The patient reported both irritative and obstructive symptoms, including a weak stream, urinary frequency, and nocturia. The patient had hypertension, type 2 diabetes mellitus, and a 40 pack-year smoking history. He did not have any family history of prostate cancer.

On digital rectal examination an enlarged prostate, estimated at > 60 g, and an irregular right lobe was found. The patient also reported macroscopic haematuria. A complete systemic examination



**Figure 1A:** A histological section of the prostate core needle biopsy shows a section through an adult *E. vermicularis* worm, no inflammatory host response is seen; haematoxylin and eosin stain, original magnification 100x



**Figure 1B:** On higher magnification, the diagnostic cuticular lateral alae are barely visible (arrows); haematoxylin and eosin stain, original magnification 200x

was unremarkable. Midstream urine was sent for urine microscopy culture and sensitivity and revealed a leukocyte count of > 500 000 cells/ml, but no identifying organism was found on culture after two days.

The patient was subsequently booked for a prostate biopsy, cystoscopy, and kidney-ureter-bladder (KUB) ultrasound. The cystoscopy was grossly normal with the only abnormality present being the enlarged lateral lobes of the prostate. The KUB ultrasound revealed no abnormalities. A total of 12 transrectal ultrasound-guided core prostate biopsies were taken and submitted for histopathological evaluation.

Histopathology revealed non-neoplastic prostatic tissue with chronic inflammation in 11 of the cores and a small focus of acinar adenocarcinoma (Gleason 3 + 3 = 6 / Grade Group 1) in 1 of the 12 cores, involving  $\pm$  5% of this core. An *E. vermicularis* worm was seen in one core (Figure 1). The worm appeared to be present in a gland and there was no inflammatory tissue response associated with it.

On further enquiry about the patient's symptoms, the patient did not experience or report a history of any gastrointestinal symptoms or itching sensation around the anus. The patient was treated with a single 100 mg dose of oral mebendazole, and the patient was placed on active surveillance for the adenocarcinoma of the prostate.

## Discussion

Enterobiasis, caused by *E. vermicularis* (commonly known as the pinworm, but also called threadworm or seatworm in some areas), is one of the most common helminthic infections in humans and has a worldwide distribution.<sup>1,2</sup> Humans are considered to be the only natural definitive host. The principal mode of transmission is via contact with a contaminated environment when the eggs are accidentally ingested.<sup>3</sup> The life cycle continues as the larvae hatch in the small bowel. The adult worms predominantly reside in the terminal ileum and the colon, particularly the caecum. Gravid female worms migrate to the anus at night where they lay their eggs in the perianal skin folds, from where the eggs mature and are released to the environment. The deposition of eggs in the perianal area is responsible for the most typical symptom of perianal pruritus, most intense at night, which may lead to excoriations and bacterial superinfection.<sup>3</sup>

Infections in adults with low worm burdens are generally asymptomatic, but complications can arise when female worms migrate to aberrant locations.<sup>2</sup> Infestation of the prostate by *E. vermicularis* has rarely been described. Zahariou et al.<sup>4</sup> reported *Enterobius* eggs and a living worm in prostate secretions obtained by prostatic massage in a 65-year-old man with lower urinary tract symptoms, mild lower back pain, and perineal discomfort. Similar to our patient, he also had haematuria and pyuria without an identifiable infectious agent on culture. Pyuria with a negative microbiological culture seems to be a recurring, although non-specific, finding in ectopic enterobiasis involving the genitourinary system in men and women.<sup>1,5</sup>

In our case, it is uncertain if the presence of the nematode in the prostate contributed to the lower urinary tract symptoms as his symptoms could have been caused by benign prostatic hyperplasia. In the older literature, Marsden reported partially calcified worm fragments in the prostate of a 60-year-old man and Symmers reported two cases of eosinophilic prostatitis associated with *E. vermicularis*.<sup>6,7</sup> Infestation of the epididymis in the male genital system has been reported elsewhere.<sup>2</sup>

Ectopic enterobiasis is more common in women and reported locations of infestation include the vulva, vagina, uterus, fallopian tube, ovary, and the peritoneum via a fallopian tube.<sup>2</sup> Additionally, it has been implicated in recurrent urinary tract infections in women, presumably because the worms carry intestinal bacteria with them into the urinary tract.<sup>1,5</sup> The likely reason for the higher incidence of ectopic enterobiasis in women is the relative proximity of the vaginal and urethral openings to the anal opening. Other reported ectopic sites that are not specific to the sexes include the lungs, liver, kidneys, spleen, and conjunctival sac (2).<sup>1-3,8</sup>

*E. vermicularis* is considered a non-invasive parasite and is unable to penetrate healthy intestinal mucous membranes.<sup>8</sup> Therefore, it is hypothesised that the most likely route of infection in our case was ascending migration of the pinworm via the urethra to the prostate, even though there are no irrefutable observations of pinworms entering the urethra recorded in the literature.<sup>4</sup> An alternative possibility of artificial inoculation exists whereby an *E. vermicularis* worm may have been transferred from the rectal mucosa or perianal region to the prostate with the biopsy needle during the transrectal prostate biopsy. However, no perianal or rectal tissue is present in the histological section to suggest that this was the mode of transmission.

Because the diagnosis of ectopic enterobiasis is usually not suspected on clinical grounds, the diagnosis is often made on histological sections. The adult worms have characteristic lateral alae ("spines") when seen in cross-section. A section through a gravid female will often reveal the characteristic refractile eggs that are flattened on one side (D-shaped). Degenerating worms and eggs often elicit a granulomatous reaction from the host tissue with variable numbers of eosinophils. Foreign body-type giant cells tend to be most numerous near eggs.<sup>9</sup> In our case, we did not observe a direct host response to the worm, likely because it was present within a dilated gland and not in the prostatic stroma. This may be similar to the usual lack of inflammation in the appendix when the worms are only present in the lumen. Alternatively, in the case of artificial inoculation during the transrectal biopsy, the lack of a direct immune response could be explained by the absence of a preceding worm to elicit the immune response.

The method of choice for the diagnosis of enterobiasis in uncomplicated enterobiasis is the microscopic identification of eggs collected with adhesive tape from the perianal area in the morning before defecation and washing. Stool examination is usually not helpful in the identification of *E. vermicularis* because the eggs are normally deposited in the perianal area and only occasionally excreted in the stool; however, it may still be indicated in certain

cases to rule out other causes. Serological tests are not available for diagnostic purposes.<sup>10</sup>

As a treatment, anti-helminthic regimens are effective. However, health education about personal hygiene is important as reinfections are common.<sup>1,10</sup>

### Conclusion

Adult worms of *E. vermicularis* can very rarely enter the male urogenital tract where it may potentially cause lower urinary tract symptoms, haematuria, and pyuria that is often culture-negative. The diagnosis is usually unsuspected because of its rarity.

### Conflict of interest

The authors declare no conflict of interest.

### Funding

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### Ethical approval

Ethical approval was exempted based on the research being a case report. Consent for publication was given by the patient in writing.

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