

Identification of *Enterobius vermicularis* in a Cervical Specimen from a Woman with Heavy Menstrual Bleeding: A Case Report

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ABSTRACT

Enterobius vermicularis, commonly known as pinworm, is an intestinal nematode that rarely involves the female genital tract. Cervical identification of this parasite is particularly uncommon and may pose a diagnostic challenge because the precise relationship of the organism to the cervical tissue may not always be established. A 41-year-old married, premenopausal woman presented with a six-month history of prolonged heavy menstrual bleeding. The patient's menstrual cycles were regular, with bleeding lasting approximately eight days and requiring approximately six pads per day. Papanicolaou smear examination revealed atypical glandular cells of endocervical origin, not otherwise specified. Pelvic Magnetic Resonance Imaging (MRI) demonstrated findings suggestive of adenomyosis, along with a bulky cervix with multiple nabothian cysts. Histopathological examination of endometrial, endocervical and cervical specimens revealed disordered proliferative endometrium and a parasitic structure morphologically consistent with *E. vermicularis* in the cervical specimen. The organism appeared to be situated within a luminal/tissue space rather than unequivocally embedded within the cervical stroma, and there was no prominent inflammatory or granulomatous tissue response. Therefore, secondary migration or luminal contamination could not be completely excluded. The clinical significance of the parasitic finding in relation to the patient's heavy menstrual bleeding also remains uncertain, particularly in view of the coexisting disordered proliferative endometrium and MRI findings suggestive of adenomyosis. The present case highlights the importance of careful histopathological evaluation, recognition of parasitic morphology and clinicopathological correlation when *E. vermicularis* is identified in an unusual cervical specimen.

Keywords: Abnormal uterine bleeding, Cervicovaginal infection, Cytopathology, Enterobiasis, Genital tract infection, Helminthic infestation

CASE REPORT

A 41-year-old married, premenopausal woman presented with a six-month history of prolonged heavy menstrual bleeding. The patient's menstrual cycles were regular, with bleeding lasting approximately eight days and requiring approximately six pads per day. There was no history of intermenstrual bleeding, postcoital bleeding, vaginal discharge, pelvic pain or pruritus ani. The patient's obstetric history was unremarkable, with no significant obstetric complications documented. There was no significant past medical or surgical history, previous parasitic infection or recent anti-helminthic treatment. Routine laboratory investigations, including complete blood count, were performed as part of the evaluation of heavy menstrual bleeding and did not reveal any significant abnormality.

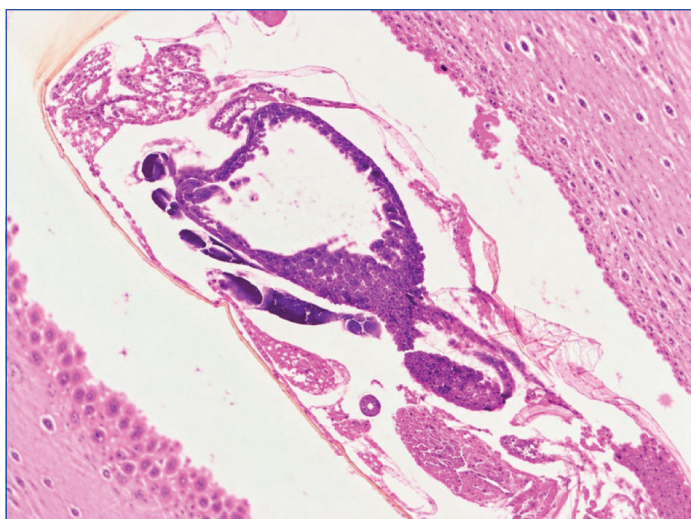
In view of the patient's prolonged heavy menstrual bleeding and the cervical and radiological findings, the initial differential diagnoses included adenomyosis, cervicitis and other benign or neoplastic cervical/endometrial lesions. The atypical glandular cells identified on Papanicolaou smear prompted further evaluation to exclude significant cervical pathology. Papanicolaou smear examination revealed atypical glandular cells of endocervical origin, not otherwise specified {Atypical Glandular Cells (AGC), Not Otherwise Specified (NOS)}, according to the Bethesda System for Reporting Cervical Cytology. Pelvic MRI showed linear T2-hyperintense striations extending from the endometrial cavity into the myometrium, with a few areas demonstrating T1 hyperintensity. These findings were suggestive of adenomyosis on imaging. The cervix appeared bulky with multiple nabothian cysts. These findings were noted as radiological findings without establishing a histopathological diagnosis of cervicitis.

For further evaluation, endocervical and endometrial samples were obtained, and histopathological examinations were performed

on 19th December 2024. Three separately labelled specimens—endometrial biopsy, endocervical curettage and cervical biopsy—were submitted for histopathological examination. The parasitic structure morphologically consistent with *Enterobius vermicularis* was identified specifically in the cervical biopsy specimen.

On histopathological examination {Haematoxylin and Eosin (H&E)}, the cervical biopsy showed a nematode-like parasitic structure within a luminal space. The organism demonstrated a thick eosinophilic cuticle with characteristic lateral alae and identifiable internal visceral structures, including reproductive and gastrointestinal structures on higher-power examination. Ova were not unequivocally identified in the examined section. These morphological features were consistent with *Enterobius vermicularis*. However, the organism was not unequivocally embedded within the cervical stroma, and the surrounding cervical tissue showed no prominent acute inflammatory, granulomatous or foreign-body reaction. Therefore, definitive cervical stromal invasion or the route by which the organism reached the cervical specimen could not be established, and luminal migration or secondary contamination could not be completely excluded. Although extraintestinal genital tract involvement by *E. vermicularis* has occasionally been associated with abnormal uterine bleeding, a direct causal relationship between the parasitic finding and the patient's heavy menstrual bleeding could not be established in the present case [Table/Fig-1].

The final histopathological examination demonstrated disordered proliferative endometrium in the endometrial biopsy and a parasitic structure morphologically consistent with *Enterobius vermicularis* in the cervical biopsy specimen. The parasitic structure demonstrated characteristic nematode morphology; however, definitive tissue invasion could not be established based on the examined sections.



[Table/Fig-1]: Histopathological examination showing a nematode-like parasitic structure consistent with *Enterobius vermicularis* within a luminal space in the cervical specimen (H&E, x40).

The clinical significance of the parasitic finding in relation to the patient's heavy menstrual bleeding remains uncertain. Although genital tract enterobiasis has been reported in association with abnormal uterine bleeding and menstrual irregularities, the present case does not establish a direct causal relationship. The patient had coexisting disordered proliferative endometrium on histopathological examination and imaging findings suggestive of adenomyosis, both of which provide alternative explanations for the bleeding. Therefore, the identification of *E. vermicularis* in the cervical specimen should be regarded as an unusual associated finding rather than a confirmed cause of the patient's heavy menstrual bleeding.

DISCUSSION

Enterobius vermicularis, commonly known as the pinworm or threadworm, is a cosmopolitan intestinal nematode responsible for enterobiasis, which remains one of the most prevalent helminthic infections worldwide [1]. Despite being geographically and socioeconomically widespread, the disease is of particular importance in childhood, where high transmission rates are often sustained by close contact and poor personal hygiene [2]. The life cycle is direct, beginning with the ingestion of embryonated eggs via the faecal-oral route [3]. Adult worms reside in the large intestine, and the gravid female typically migrates to the perianal region, primarily at night, to deposit eggs. This perianal irritation is the classic presentation of the disease [4].

While infection is overwhelmingly restricted to the gastrointestinal tract, the migration of the female worm can occasionally lead to ectopic, extraintestinal disease [4,5]. In female patients, this migration can extend into the genitourinary system, causing various manifestations such as vulvovaginitis, pelvic inflammatory disease, or in rare instances, infestation of the endometrium, fallopian tubes, or cervix [6]. Ectopic enterobiasis is diagnostically challenging, as its symptoms may be non specific or mimic serious gynaecological pathology, including pelvic masses or abnormal uterine bleeding [7]. Given the potential for misdiagnosis and the straightforward treatment available, recognising *E. vermicularis* as a differential diagnosis for unexplained gynaecological symptoms, especially heavy menstrual bleeding, is crucial for patient management and preventing unnecessary invasive procedures [8]. Cervical involvement by *E. vermicularis* is extremely uncommon, with only a limited number of cases described in the literature [9].

The present case highlights the identification of a parasitic structure morphologically consistent with *E. vermicularis* in a cervical specimen from a 41-year-old woman presenting with heavy menstrual bleeding, representing an unusual site and clinical context. The natural habitat of *E. vermicularis* is the human colon, specifically the

cecum, appendix, and adjacent regions of the large intestine [10]. Infection begins with the ingestion or inhalation of infective eggs, commonly through contaminated hands, clothing, or fomites [11]. After ingestion, larvae hatch in the duodenum and mature as they migrate to the cecum, where fertilisation occurs. Gravid females migrate nocturnally to the perianal region, laying up to 15,000 eggs, which become infective within hours [12]. Autoinfection through hand-to-mouth transfer and person-to-person transmission are the primary routes of spread, explaining high reinfection rates within families and institutional settings [13].

Globally, enterobiasis affects over 400 million people, with a higher incidence in children aged 5-10 years [10]. Prevalence in institutionalised or densely populated settings can reach 72%. Despite its ubiquity, enterobiasis remains underrepresented in research and is notably absent from the World Health Organisation's list of neglected tropical diseases [14]. Adult infections, particularly in women, are likely underdiagnosed due to atypical or asymptomatic presentations. Although primarily intestinal, *E. vermicularis* can migrate to the female genital tract, possibly via the perianal and vaginal routes. Gravid females may enter the vagina and ascend to the uterus, fallopian tubes, or cervix [15]. The resulting tissue reactions- acute and chronic inflammation, granulomatous response, or epithelial ulceration- can mimic neoplastic or inflammatory gynaecological conditions [6]. Identification of a parasitic structure morphologically consistent with *E. vermicularis* in the cervical specimen underscores the diagnostic challenge posed by such rare findings and the necessity for careful histopathological evaluation.

An important feature in the present case was the absence of a prominent acute or chronic inflammatory response in the surrounding cervical tissue. Although tissue reactions including inflammation, granulomatous response and epithelial ulceration have been described in ectopic genital tract enterobiasis, their absence does not necessarily exclude the presence of the organism. The relatively bland tissue background in the present specimen also raises the possibility that the parasitic structure represented luminal or surface-associated migration rather than established tissue invasion. Therefore, the precise biological significance and route of acquisition of the organism in the present case remain uncertain. Although abnormal uterine bleeding has been reported in association with female genital tract involvement by *E. vermicularis*, the clinical significance of the parasitic finding in relation to the patient's heavy menstrual bleeding remains uncertain. The co-existing disordered proliferative endometrium and MRI findings suggestive of adenomyosis provide alternative explanations for the bleeding. Therefore, a direct causal relationship between the cervical parasitic finding and heavy menstrual bleeding cannot be established in the present case.

The route by which *E. vermicularis* may reach the female genital tract is not completely established. Ascending migration from the perianal region through the vulva and vagina into the upper genital tract has been proposed as a possible mechanism [16]. In the present case, the precise route cannot be demonstrated histologically. Furthermore, because the parasitic structure appeared to be located within a luminal space adjacent to the cervical tissue and the surrounding tissue lacked a significant inflammatory or foreign-body response, secondary migration or luminal contamination cannot be completely excluded. Nevertheless, the morphological features identified on histopathological examination were consistent with *E. vermicularis*. Correlation with the gross specimen, histological sections and additional representative high-power images is therefore important before designating the finding as true cervical tissue infestation. Typical intestinal infection presents with perianal pruritus, restlessness, and insomnia due to nocturnal migration of worms. However, extraintestinal infestation can cause a range of diverse symptoms depending on the organ involved. Cervical and endometrial infestations may present with abnormal uterine bleeding,

vaginal discharge, or pelvic discomfort. Severe complications such as salpingitis, tubo-ovarian abscess, and infertility have been reported [12].

Diagnosis of enterobiasis traditionally relies on microscopic identification of eggs from perianal skin using the Graham's adhesive tape test [10]. However, for ectopic infections, diagnosis is usually incidental during histopathological examination of excised tissue. Stool examination is generally non contributory, as eggs are rarely present in faeces [11]. In the present case, histopathological examination demonstrated a parasitic structure morphologically consistent with *E. vermicularis* in the cervical specimen. However, ova were not unequivocally identified in the examined section, and therefore the diagnosis was based on the characteristic morphological features of the parasite rather than demonstration of ova.

The atypical glandular cells identified on pap smear were not reproduced as a significant glandular neoplastic lesion in the subsequent histopathological examination. The relationship between the cytological finding and the identification of *E. vermicularis* in the cervical specimen is therefore uncertain. Parasitic irritation or associated reactive epithelial changes may theoretically contribute to cytological atypia; however, a direct causal relationship cannot be established in the present case. The cytological, radiological and histopathological findings should therefore be interpreted independently and in clinical correlation. The radiological impression of adenomyosis was not established as a histopathological diagnosis in the specimens examined. Similarly, the prominent pelvic vessels represented an imaging finding rather than a confirmed diagnosis of pelvic congestion syndrome. Thus, the MRI findings should be regarded as clinical and radiological impressions that prompted further tissue evaluation, whereas the final pathological diagnoses were based on histopathological examination.

Standard treatment includes anti-helminthic agents such as mebendazole, albendazole, or pyrantel pamoate administered as a single dose, followed by a repeat dose after two weeks to eradicate newly hatched worms. Given the high rate of reinfection, simultaneous treatment of household members and emphasis on hygiene are essential. Mebendazole, though poorly absorbed systemically, remains the drug of choice for intestinal infection, while albendazole or ivermectin is preferred for extraintestinal or urogenital involvement [10]. Preventive strategies include maintaining personal hygiene, washing bed linens and undergarments in hot water, trimming fingernails, and discouraging nail biting.

CONCLUSION(S)

Identification of a parasitic structure morphologically consistent with *Enterobius vermicularis* in a cervical specimen is an uncommon finding that warrants careful histopathological evaluation and

clinicopathological correlation. In the present case, the apparent luminal location of the organism and absence of a prominent inflammatory response mean that secondary migration or contamination cannot be completely excluded. Furthermore, a direct causal relationship between the parasitic finding and the patient's heavy menstrual bleeding cannot be established. Recognition of the characteristic morphological features, supported by appropriate high-power photomicrographs and correlation with the specimen, is important when evaluating unusual parasitic findings in cervical specimens.

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