

# ENTEROBIUS VERMICULARIS FAMILY INFECTION DETECTED BY URINE SEDIMENT SCREENING

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**Introduction:** Pinworm *Enterobius vermicularis* is transmitted through the anal-oral route, by swallowing eggs with larvae that become invasive in already four hours. The larvae hatch in the small intestine and migrate to the large intestine where they mature into adults in 2 to 6 weeks. Males impregnate females that come out in the anal area at night and lay the characteristic asymmetric eggs. The main symptom is persistent itching of the anal skin. **Case report:** A female patient aged 35 years experienced itching and burning sensation in the urogenital area. A week ago, similar symptoms have appeared in her 3-years old daughter for which her physician prescribed antimicrobial and antifungal therapy. The patient brought her first voiding morning urine sample for urine culture. Additionally, ten milliliters of urine was centrifuged, supernatant removed and the sediment examined microscopically. Examination of urine sediment at 10x magnification revealed many epithelial cells and calcium carbonate crystals, rare polymorphonuclear leukocytes, rare bacteria and many round and oval shapes. Examination of the same sample at 40x magnification confirmed that those regular shapes were eggs of *Enterobius vermicularis*. Larvae were visible both within the eggs and free out of the eggs, including those that were just about to leave the thin egg shell. Family history was taken and perianal specimens (tape test) from all family members were obtained. *Enterobius vermicularis* eggs were found in the patient's (the mother) perianal tape sample, the 3-year old daughter and a 10-year old son, while her husband's (the father) and the 14-years old son's specimens were negative. **Conclusion:** Perianal tape test is the method of choice for enterobiasis. The presented case showed that urine sediment microbiological examination could provide a worthy information on family infestation with small baby worm, as well. Urinary sediment could serve for valuable examination in unclear situations and if the reliable data were not available, as in small children.

**Key words:** *Enterobius vermicularis*, urine sediment, schotch tape, mebendazole

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## BACKGROUND

*Enterobius vermicularis* (*E. vermicularis*) is distributed worldwide and primarily is a parasite in young children. *Enterobius* eggs are elongated and are approximately 50-60 µm long and 20-40 µm wide. The eggs develop rapidly and become infective within 4-6 h, at which time eggs contain larvae (1). Such fast development of eggs to the infective stage and their ability to persist in external environment leads to rapid dissemination of the infection from child to child and to adults. Infection is very common in institutional settings and in families with young children.

Adult *E. vermicularis* females migrate out of the intestinal tract and lay their eggs on the perianal surface, from where they adhere to the skin, hair, or bed clothing. Such infected surfaces may be a source of infection or reinfection in others. Large worm burdens cause pruritus and may cause loss of sleep, especially in young children. Occasionally, adult females enter the vagina, uterus, or fallopian tubes, where they die. Disintegration of dead worms and liberation of the eggs contained in the uterus results in inflammatory response and granuloma formation (1). Ectopic migration and involvement of urinary tract may lead to recurrent urinary tract infection (UTI) and inva-

sion of other unusual areas of the human body with consequent infection (2,3). According to one study, annual incidence of *E. vermicularis* in acute appendicitis specimen from a pediatric cohort was 7% (4). *E. vermicularis* eggs can be seen in the vaginal smear because of contamination, but also as a cause of vulvovaginitis with a lot of acute inflammatory cells (5).

Scotch tape or cellulose tape method is the most widely used procedure for the diagnosis of pinworm infection (1). Scotch tape technique should be done in the morning with a clear tape before bathing or defecation, so that the eggs laid during the night by the migrating females can be picked up. Transparent Scotch tape is applied directly to the perianal area, and then placed on the microscopic slide for examination.

Microscopic examination of the urine sediment provides useful information about the health condition of the patient. It is particularly important for the diagnosis of urinary tract diseases. The presence of a large number of bacteria, white blood cells and red blood cells can indicate kidney or bladder disease. Several parasites may be recovered and identified from urine, such as *Trichomonas vaginalis* and *Schistosoma haematobium* (1).

### CASE REPORT

A healthy young woman presented with unpleasant sensations in the urogenital region, pricking and itching, which led her to believe she had an UTI. She brought her first morning midstream urine to the laboratory for microbiological analysis. The urine collection was performed following all the urine culture collection instructions (6).

The urine was centrifuged at 3000 g for 10 minutes and the supernatant was decanted. The sediment was analyzed under the light microscope at x10 and x40 magnification. The analysis at x10 magnification identified a lot of squamous epithelial cells and calcium carbonate crystals, rare polymorphonuclear leukocytes, bacteria, and a lot of round formations resembling eggs. The examination at x40 magnification confirmed *E. vermicularis* eggs with visible larvae inside and outside the thin shell (Figure 1).

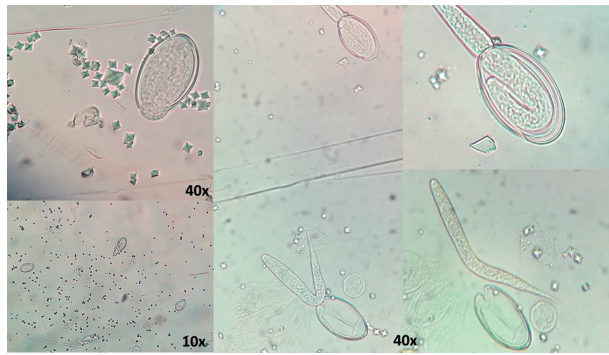


Figure 1. *Enterobius vermicularis* eggs in urine sediment with larvae inside and outside shell (10x and 40x magnification), Batarilo

A week prior to the patient's first symptoms, her 3-year-old daughter, not going to kindergarten, presented with extreme urogenital itching and burning sensations, particularly during the night. The general practitioner performed a urine dipstick test, which indicated the presence of polymorphonuclear leukocytes in the tested urine. Antibiotic therapy was initiated, assuming the child had an UTI. Three days later, since the symptoms did not disappear, therapy was shifted, and an antifungal ointment was administered.

Other family members, the husband and two sons, had no symptoms indicating the presence of *Enterobius*. Scotch tape specimens from all family members were taken and examined. *E. vermicularis* eggs were found in the Scotch tape specimens collected from the mother, the 3-year-old daughter and the 10-year-old son (Figure 2), whereas specimens from the husband (the father) and 14-year-old son were negative.

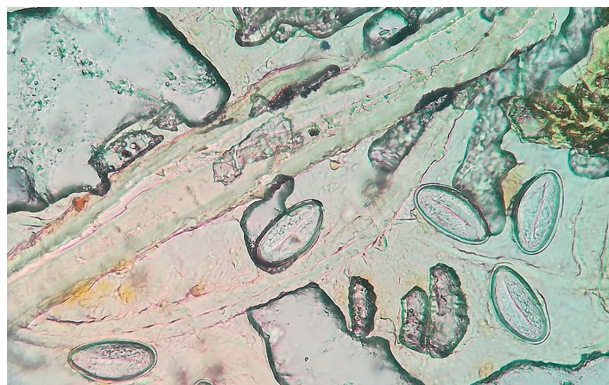


Figure 2. *Enterobius vermicularis* eggs in Scotch tape (40x magnification), Batarilo

All family members were treated with anthelmintic therapy, mebendazole, twice daily for 3 days. Therapy was repeated after 2 weeks. The follow-up Scotch tape examination of all family members' specimens proved negative, confirming that therapy was effective.

## DISCUSSION

Microscopic examination of urine sediment may be a valuable diagnostic tool in patients with unusual urinary tract symptoms, which are not attributed to bacterial bladder infections. Accidental findings of *E. vermicularis* eggs in the mother's urine sample helped resolve the 3-year-old girl's infestation with *E. vermicularis*, which was misdiagnosed as an UTI due to the similarity of symptoms. The child was misdiagnosed also because of her inability to express her symptoms as adults do, which led to misuse of antibiotic and antifungal drugs. Microscopic examination of urine sediment also helped detect and resolve family infestation with *E. vermicularis*.

## CONCLUSION

Scotch tape specimens are the method of choice for intestinal enterobiasis diagnosis. This report shows that urine sediment microscopy provided valuable information indicating family *E. vermicularis* infestation. Urine sediment microscopy, although inexpensive and quite simple, is often a neglected procedure. Unfortunately, the interest seems to be lost and the utility forgotten, although it can provide very valuable information. This case report emphasizes the importance of urine sediment microscopy, especially when there

is a challenge of acquiring adequate data, for example in small children.

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## S A Ž E T A K

### OBITELJSKA INFESTACIJA DJEČJOM GLISTOM *ENTEROBIUS VERMICULARIS* OTKRIVENA PREGLEDOM SEDIMENTA MOKRAĆE

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**Uvod:** *Enterobius vermicularis* prenosi se analno-oralnim putem, gutanjem jajašaca s ličinkom koje postaju invazivne već nakon 4 sata. Ličinke se izlegu u tankom crijevu i migriraju u debelo crijevo gdje sazrijevaju u odrasle jedinke za 2 do 6 tjedana. Mužjaci oplode ženke koje noću izlaze u analno područje i odlažu karakteristična asimetrična jajašca. Glavni simptom je uporan svrbež kože tog područja. **Prikaz slučaja:** Pacijentica u dobi od 35 godina imala je svrbež i osjećaj pečenja u urogenitalnom području. Tjedan dana prije pojave simptoma slične simptome imala je njezina trogodišnja kći kojoj je liječnik ordinirao antibiotičku i antifungalnu terapiju. Pacijentica je donijela uzorak prve jutarnje mokraće i napravljena je urinokultura. Dodatno je 10 mL mokraće centrifugirano, supernatant je uklonjen i sediment mikroskopski pregledan. Pri povećanju 10x utvrđeno je mnogo pločastih epitelnih stanica i kristala kalcijeva karbonata, rijetki polimorfonuklearni leukociti, rijetke bakterije i puno okruglih i ovalnih oblika. Pregledom istog uzorka sedimenta uz povećanje 40 x potvrđeno je da su ti pravilni oblici jajašca *Enterobius vermicularis*. Ličinke su bile vidljive unutar jajašca, ali bilo ih je i slobodnih izvan jajašaca, kao i onih koje su se upravo oslobađale iz tanke ljuske jajeta. Prikupljena je ciljana obiteljska anamneza i dobiveni su uzorci perianalnih otisaka svih članova obitelji. Jaja *Enterobius vermicularis* pronađena su u uzorku perianalnog otiska pacijentice (majke), trogodišnje kćeri i 10-godišnjeg sina. Uzorci perianalnog otiska supruga (oca) i 14-godišnjeg sina bili su negativni. **Zaključak:** Perianalni otisak ljepljivom vrpcom je postupak izbora za otkrivanje crijevne enterobijaze. U prikazanom slučaju mikroskopski pregled sedimenta mokraće dao je vrlo vrijedne informacije, odnosno otkrivena je obiteljska infestacija malom dječjom glistom. Pregled sedimenta mokraće može biti osobito vrijedna pretraga u nejasnim situacijama i kada se ne mogu dobiti odgovarajući podatci, primjerice od male djece.

**Cljučne riječi:** *Enterobius vermicularis*, sediment mokraće, samoljepljiva traka, mebendazol