***Balantidium coli* in urine sediment: report of a rare case presenting with hematuria**

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Abstract *Balantidium coli* (*B. coli*) is the only trophic ciliate of low virulence causing dysentery in human. However, may be due to their active motility and invasive nature, they have been rarely described to cause infection in extraintestinal sites also. We herein describe a case where trophozoites of *B. coli* were detected in urinary sediment examination of an elderly female presenting with mild fever, dysuria and hematuria for last 1 week. The parasites were identified by their characteristic morphology and rapid spiraling motility. This is only the third case described in literature to detect *B. coli* in urine sediment.

Keywords *Balantidium coli* · Urine sediment · Hematuria

Introduction

Balantidium coli (*B. coli*) is the largest and only ciliated protozoon to infect human. Pig is the reservoir host, and water contaminated with porcine or human feces is the

most common vehicle for balantidiosis. In human natural habitat are cecum and colon (Schuster and Ramirez-Avila 2008). Clinical manifestation of balantidiosis ranges from asymptomatic host to fulminant dysentery (Vasquez and Vidal 1999). Extraintestinal sites of infection include the appendix, liver, lung and genitourinary region (Dodd 1991; Sharma and Harding 2003; Anargyrou et al. 2003). So far only two cases of *B. coli* in urine sediment were described in literature (Umesh 2007; Maino et al. 2010). This case describes infection of *B. coli* causing cystitis and hematuria in an elderly female from rural India.

Case report

A woman of 72 years presented with symptoms of mild fever, dysuria, increased frequency of micturition and pelvic pain for 7 days. Her fresh mid stream urine (MSU) was sent for routine examination. Physical appearance of the urine was smoky and mildly turbid; microscopic examination of the sediment showed plenty of red cells and 5–6 pus cells per high power field. Few large cigar to ovoid shaped ciliated parasites (approximately $200 \times 50\mu$) were seen to swim rapidly across the slide (Fig. 1). The organism had a mouth that was located in the tapering anterior end (cystosome) and a rounded posterior end (cytopyge). Several food vacuoles, macronucleus and few ingested red blood cells were present within cytoplasm. The body was covered with pellicle with longitudinal striation, along with short delicate cilia all around, of uniform length. The cilia lining the mouth part appeared to be longer than others. The morphology and swimming pattern was characteristic of *B. coli*. A few motile trophozoites of *Trichomonas vaginalis* were also seen. A repeat MSU sample from the patient showed

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Fig. 1 Urine sediment showing a trophozoite of *B. coli* in a background of red blood cells (Wet mount, 40× objective)

similar organisms. Her complete hemogram showed microcytic hypochromic anemia with hemoglobin 9.8 gm/dl. HIV serology was negative. This patient had a past history of intermittent diarrhea treated by metronidazole. First morning fecal sample was examined for ova, parasites and cysts for three consecutive days, all of which were negative. The patient clinically improved with oral metronidazole for 7 days (750 mg thrice daily), and subsequent MSU showed clearing of the parasites and resolution of hematuria.

Discussion

Balantidium coli are low virulence pathogenic parasites with worldwide distribution. Usual mode of transmission is ingestion of infective cysts through water contaminated with porcine feces, though human to human transmission may also occur. Ingested cysts liberate trophozoites which reside and replicate by binary fission in the large bowel (Schuster and Ramirez-Avila 2008). This patient had no contact with pig, but had history of bathing in the pond; hence she might have been infected from contaminated water of the pond. Many patients remain asymptomatic but some have persistent diarrhea and a few develop more fulminant dysentery (Dodd 1991). Intestinal hemorrhage, ulceration, focal necrosis and perforation can occur and mediated by the production of balantidial proteolytic enzyme. Extra intestinal spread has also been described. Genitourinary sites of infection include uterine infection, vaginitis and cystitis. This patient was suffering from cystitis and hematuria due to *B. coli* infection of urinary

bladder. The organism may have invaded from the colonic mucosa to the urinary bladder or directly from the anal area (Sharma and Harding 2003; Umesh 2007). Sharma and Harding opine that infection of genitourinary sites occur due to direct spread from the anal area or secondary to rectovaginal fistula creation by the parasite (Sharma and Harding 2003). The stool examination in this patient was non contributory possibly due to intermittent treatment with metronidazole. Lung infections with *Balantidium* are infrequent but noteworthy. Cysts of *Balantidium* are large and would not be carried over great distances, either on air currents or in water droplets. Thus, infection by inhalation would require direct contact with aerosol droplets (Schuster and Ramirez-Avila 2008). Immunocompromised individuals, malnutrition and alcoholism appear to act as important contributory factors for balantidiosis (Anargyrou et al. 2003; Cermeño et al. 2003).

Laboratory diagnosis of *B. coli* is relatively easy because of its large size and spiraling motility. In most of the cases morphology of the trophozoite has been described in dysenteric stool and the cyst phase commonly in formed stool (Schuster and Ramirez-Avila 2008). Balantidial cysts are 40–60µ in diameter and binucleate in contrast to *Entamoeba histolytica* cysts which are smaller (10–20 µm) and are quadrinucleate. Phase contrast microscope is helpful for viewing internal structures. In this patient excellent morphology of the parasite could be demonstrated in urine sample by light microscopy. The only parasite with a similar morphology is *Paramecium* which can come from contaminated water. However, this parasite is generally non-pathogenic, though rarely it can colonize urinary tract in patients on dialysis (Singh and Dash 1992). As the patient is symptomatic, it is more likely to be *B. coli* in our case. Tetracycline and metronidazole are the drugs of choice for *B. coli*. (Schuster and Ramirez-Avila 2008). Ensuring clean uncontaminated water supply is probably the most efficient strategy to prevent human infection.

In conclusion, *B. coli* a rare urinary pathogen, should come in the differential diagnosis in elderly debilitated patients presenting with dysuria and hematuria. Microscopic examination of fresh urine sediment can easily diagnose this large parasite by its characteristic morphology and rapid spiraling motility.

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Conflict of Interest Nil.

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