CASE REPORT

A case of uncomplicated urinary myiasis in a healthy female

Olugbemisola Oredein McCoy, Andrew Rabley, Michaela M Prasad, Eric S Rovner

Department of Urology,
Medical University of South
Carolina, Charleston, South
Carolina, USA

Correspondence to
Dr Michaela M Prasad,
prasadm@musc.edu

Accepted 3 June 2016

SUMMARY

Myiasis is the infestation of a mammal by fly larvae which thrive by feeding on, and occupying the host. Largely a problem in livestock, human infestations in rural tropical areas of the globe are not uncommon. Myiasis may involve the skin, eyes, nasal passages, gastrointestinal and genitourinary tracts. Cases of urinary myiasis are rare in the USA; however, it may occur in immunocompromised hosts, those with previous urologic instrumentation or those with poor socioeconomic status. We present a case of successful outpatient treatment of urinary myiasis in an immunocompetent female without prior urological history.

BACKGROUND

Urinary myiasis is described as the invasion of the urinary tract by larvae of the Diptera order of flies. Myiasis can be further categorised as obligatory or facultative. Eggs may be deposited into tissues (eg, open wounds), and the resulting larvae are capable of burrowing and forming nests within these environments. Eventually, the nests develop into microabscesses once inflammatory cells are activated and summoned to the site, leading to the development of granulomas over time. Urinary myiasis of any form is rare and tends to affect the severely immunocompromised, those with poor genitourinary hygiene, and those living in or visiting environments with poorly sanitised water sources. Myiasis is commonly seen in developing countries in the eastern hemisphere with increased prevalence in open wounds (cutaneous myiasis). There have been reports of infections of the eyes, ears and nasal passages as well with rare cases of urinary myiasis.¹ Invasion of the urinary tract tends to occur primarily through inoculation with contaminated water sources and affects females more commonly than males.^{1 2} To our knowledge, urinary myiasis in a healthy, immunocompetent, non-instrumented female has not been previously reported.

CASE PRESENTATION

A 50-year-old female on antihypertensive and low dose oral antihyperglycaemic medication presented to an Infectious Disease clinic reporting 3 months of intermittent passage of worms in her urine. Symptoms included intermittent dysuria with larvae passage. She denied any knowledge of a source of infection, denied recent urethral catheter placement, genitourinary or pelvic procedures, or prior genitourinary pathology. Her diabetes was well controlled and she did not have glucose present in her urine. She had recently relocated to

Charleston, South Carolina, from Mexico. On physical examination, the patient was noted to be well-appearing, well-groomed, appropriate per neurological examination and appearing her stated age. She did endorse minimal suprapubic tenderness as well as left flank discomfort with palpation.

INVESTIGATIONS

The urine sample provided by the patient at the initial visit revealed small, roughly 0.5 cm dark larvae on visual inspection (figures 1 and 2). Vaginal speculum examination prior to the collection of urine did not reveal any evidence of larvae. Renal ultrasound performed for complaints of flank discomfort revealed a well-circumscribed hyperechoic area in the upper pole of the left kidney. Urinalysis showed leukocyte esterase and few bacteria with a negative urine culture. Microbiological analysis identified the larvae as belonging to the Diptera order of flies.

TREATMENT

Treatment was initiated with a single dose of ivermectin (3 mg oral tablet). Additionally, cross-sectional imaging was obtained to better characterise the renal lesion seen on ultrasound. CT scan revealed only an incidental, small left upper pole renal angiomyolipoma. No bladder abnormalities were detected.

Figure 1 Motile larvae from urine specimen of patient collected in a clean catch fashion.

CrossMark

To cite: McCoy OO, Rabley A, Prasad MM, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2016-214783

Figure 2 Additional views of larvae in the urine.

OUTCOME AND FOLLOW-UP

The patient denied passage of larvae 1 week after completing ivermectin. She also denied symptoms of dysuria or incontinence. Cystoscopy was performed a few weeks later, and demonstrated normal bladder mucosa and orthotopic ureteral orifices without any evidence of larvae or other lesions suggestive of an acute or prior infection. The patient has since remained clear. She will follow-up in 1 year with a urine culture and urinalysis.

DISCUSSION

Urinary myiasis is diagnosed by microbiological identification of the larvae within a urine specimen. With regard to therapy, no standard treatment regimen exists. In the literature there are only isolated case reports of urinary myiasis. Treatment is usually initiated with Ivermectin, an antihelminthic oral agent, with known activity against arthropods such as flies and ticks. The drug is metabolised in the liver, and it or its metabolites are excreted largely in the faeces with less than 1% of the administered dose excreted in the urine (1996, 2007 Merck Sharp & Dohme Corp., a subsidiary of Merck & Co., Inc., MSDS). It acts to eliminate parasites and arthropods by binding to glutamate-gated chloride channels in nerve and muscle cells of invertebrates resulting in paralysis and expulsion. The blood brain barrier that exists in mammals, however, protects against these effects.

Some reports demonstrate clearance of myiasis in the setting of treatment. One article reported a middle-aged male with chronic hepatitis B treated with interferon therapy for urinary symptoms of urgency, frequency and dysuria with concurrent passage of larvae. His symptoms resolved briefly, but returned 3 months later with subsequent identification of larvae. He was treated with oral Ivermectin, with improvement in symptoms after 6 weeks.³ Another case demonstrated resolution of urinary symptoms following antibiotic and antiseptic treatment of the

infested area in a 50-year-old female who had recently undergone bladder surgery.⁴

Meanwhile, there have been a few reports demonstrating spontaneous recovery without any treatment. Invasion and resulting symptoms were self-limited in some cases with dissipation of discomfort and absence of larvae after 1 day to several weeks.⁵ The mechanism of resolution was not proposed in detail, but it can be hypothesised that immunocompetent individuals are able to mount the necessary response to destroy and eradicate the eggs and larvae.

It would be worthwhile to determine if there is a role for intravesical agents, such as Ivermectin a lipophilic drug, given the low levels of Ivermectin excreted into the urine. There are not any published studies pertaining to the feasibility and efficacy of this mode of treatment; however, we know that Ivermectin can be formulated into a 2 mg/mL elixir in humans or a 1% solution for treatment of parasites in livestock.

Nonetheless, we were able to document successful treatment of a case of urinary myiasis in a healthy immunocompetent female.

Learning points

- ▶ Thorough review of the literature prior to generating a treatment plan is believed to have contributed to successful management of this rare case of urinary myiasis.
- ▶ It is imperative to work closely with pharmacists and drug formulation experts to develop optimal treatment approaches in non-conventional cases.
- ▶ Frequent follow-up via office visits and telephone communication is crucial in ensuring patient satisfaction and safety.

Contributors OOM constructed the manuscript and compiled data from the Drug Information department regarding feasibility of certain treatment options. AR assisted in literature review as well as maintaining an open line of communication with the patient to ensure clinical stability between office visits. ESR provided guidance in formulating a treatment plan after drawing on expertise from the literature, Drug Information and Pharmacy departments. ESR and MMP revised the original draft.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Day JF, Edman JD, Kunz SE, *et al.* Chapter 4 Direct injury: phobias, phycoses, annoyance, allergies, toxins, venoms, and myiasis. In: Eldridge BF, Edman JD, eds. *Johns Edition Medical entomology: a textbook on public health and veterinary problems caused by arthropods*. Davis, CA: Springer Science & Business Media, 2003:134.
- 2 Hyun DY, Cain MP, Blue-Hnidy DE, *et al.* Urinary myiasis associated with ureteral stent placements. *Pediatr Infect Dis J* 2004;23:179–81.
- 3 Samuel MI, Taylor C. An unusual and unsettling place for a worm. *Int J STD AIDS* 2010;21:524–5.
- 4 Güven E, Kar S, Doğan N, *et al.* [Urogenital myiasis caused by *Psychoda albipennis* in a woman]. *Turkiye Parazitolo Derg* 2008;32:174–6.
- 5 Wakid MH. A laboratory-based study for first documented case of urinary myiasis caused by larvae of *Megaselia scalaris* (Diptera: Phoridae) in Saudi Arabia. *Korean J Parasitol* 2008;46:33–6.

Copyright 2016 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow