

## Guinea-worm (*Dracunculus medinensis*) infection presenting as a diabetic foot abscess: A case report from Kerala

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### ABSTRACT

Dracunculiasis or guinea-worm infection is a water-borne, parasitic disease that can cause major morbidity. Dracunculiasis in patients with diabetes can be misdiagnosed as a diabetic foot abscess, which is a common complication of poorly controlled diabetes. This is a report of guinea-worm disease (GWD) in a 57-year-old man with diabetes from a rural area of Kerala. There is need for awareness among physicians about the occurrence of GWD in people with diabetes and the need to ensure supply of safe drinking water to prevent its re-emergence. Though WHO has declared India free of GWD, a few cases have been reported from the country.

Natl Med J India 2019;32:22–23

### INTRODUCTION

Guinea-worm disease (GWD) or dracunculiasis is a rare debilitating disease caused by *Dracunculus medinensis*. This water-borne disease affects the rural parts of developing countries of Africa and South Asia where safe drinking water is not available.<sup>1</sup> The disease is not fatal but causes considerable morbidity. In 2017, WHO reported only 25 human cases from three African countries.<sup>2</sup> GWD is now seen only in remote areas of Africa, while Asia is considered free of the disease.<sup>1</sup> According to a 2012 report of the National Centre for Disease Control, Andhra Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Gujarat and Tamil Nadu were known endemic areas of GWD in India.<sup>3</sup> Not a single case of GWD was reported from any part of India during 1998–99.<sup>3</sup> Though WHO declared India as free from GWD in 2000,<sup>3</sup> few cases were reported from Rajasthan and Maharashtra during 2002–12.<sup>1,4</sup>

Diabetic foot abscess is a common complication of poorly controlled diabetes. Dracunculiasis usually presents as a small abscess in the lower extremities. Hence, there is a chance of misdiagnosis of dracunculiasis in people with diabetes as a diabetic foot abscess. A dracunculiasis abscess may be overlooked and treated by antibiotics and drainage because the infection is rare and physicians may not have seen the infection during their practice.

We report GWD in a 57-year-old man with diabetes from a rural area of Kerala. A review of the literature did not reveal the occurrence of GWD in Kerala before or after the declaration of WHO of India being free of the disease. To the best of our knowledge, this is the first report of GWD in Kerala.

### THE CASE

A 57-year-old man from Kannur district, Kerala was on treatment for type 2 diabetes since 2011. He had a history of diabetes mellitus for 8 months and hypertension for 4 years. He was on

metformin hydrochloride 500 mg twice daily and losartan potassium 25 mg (one tablet/day). There was no family history of diabetes or hypertension. He did not have any history of foot infection, and there was no history suggestive of diabetic peripheral neuropathy. During a regular follow-up in 2013, he presented with a swelling with redness and pain of 7 days' duration on the lateral side of the left leg, just above the lateral malleolus which developed into an abscess of 3 cm×3 cm with mild cellulitis around it. At the time of presentation, his weight was 70 kg, height 161 cm, body mass index 27.1 and waist circumference 34 inches. His blood pressure was 130/80 mmHg and pulse rate was 70/minute and regular. His respiratory and cardiovascular system examination were unremarkable. Per abdomen examination showed enlargement of the liver by 4 cm. Peripheral pulses and deep tendon reflexes were normal. He was prescribed azithromycin (250 mg twice daily), clonotriptyline and 10% emollient glycerin. After 7 days, he reported over phone, the emergence of a whitish, thin worm-like structure from the abscess. From the description, it was assumed to be a guinea worm and hence he was advised to extract the worm using a stick and the technique was explained to him. The worm was rolled on the stick and pulled out slowly. The extracted worm was 25 cm long and 1.5 mm wide and was brought to the clinic preserved in formalin. It was identified as guinea worm (Fig. 1a and b). The abscess healed a few days after



FIG 1. (a) Small abscess found on the lateral side of the left leg, just above lateral malleolus; (b) the guinea worm preserved in formalin after extraction

extraction of the worm. He had no history of travelling outside Kerala. Hence, it was assumed to be an endogenous case of dracunculiasis.

## DISCUSSION

GWD is a parasitic infection of human beings.<sup>1,5,6</sup> The causative agent *Dracunculus medinensis* is a long, thread-like worm.<sup>2</sup> The male worm measures 12–29 mm long and 0.4 mm wide whereas the female worm measures 50–120 cm long and 1–2 mm wide.<sup>5</sup> The worm enters humans through drinking water contaminated with parasite-infected cyclops.<sup>2</sup> Once in the human body, the larvae are released in the stomach and migrate into the wall of the abdomen and thorax in 15 days across the peritoneal cavity where they molt twice to become sexually mature. After mating, the males remain in the tissues and become encapsulated and die in few months. The females move down the muscle plane and by 10 months grow in length with the uterus being filled with larvae. They emerge about one year after infection from the feet and lower legs. If the affected portion of the body is cooled by immersion in water, the first stage larvae are expelled in large numbers from the ruptured uterus which is engulfed by the cyclops where further development occurs.<sup>5</sup> From the time infection occurs, it takes 10–14 months to complete the transmission cycle and for the mature worm to emerge from the body.<sup>2</sup> The clinical features may include slight fever, itchy rash, nausea, vomiting, diarrhoea and dizziness. The blister forms most commonly on the lower extremities, enlarges and causes severe pain and burning sensation. Cellulitis, abscess, septic shock and septic arthritis are complications of the acute stage, while calcification of the worm and joint deformities can occur in late stages.<sup>1</sup> Radiological diagnosis is possible by the detection of long, characteristic, linear, coiled, 'chain mail' type of calcification present in the soft tissues.<sup>1</sup> Treatment is winding the worms out on a stick a few centimetres a day, combined with a clean dressing and antibiotic ointment to prevent secondary bacterial infection.<sup>5</sup>

A non-specific granulomatous cervical lymphadenitis and a non-specific liver granuloma had developed after 3 years in our

patient. This could be due to the foreign body reaction to the degenerating male worms. It has been observed that in parasitic infections, granuloma can be formed as a result of a non-degradable product of the parasites or due to hypersensitivity responses.<sup>7</sup>

## Conclusion

Although GWD is considered as eradicated, occasional cases may occur. Physicians should be aware of this disease, especially in patients with diabetes in areas where dracunculiasis was once prevalent. They should have a high index of suspicion for early diagnosis and treatment of the infection. This report points to the possibility of re-emergence of this parasitic infection. The detection of guinea worm from Kerala, in spite of effective measures implemented by the government for controlling infections, is of concern. The government should scale-up provisions of clean and safe drinking water to the public.

## ACKNOWLEDGEMENT

The author is grateful to Ms. Amy, Anglin P. for drafting and submitting the manuscript.

*Conflicts of interest:* None declared

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