SPONTANEOUS EMERGENCE OF A GNATHOSTOMA SPINIGERUM ADULT WORM FROM THE ABDOMINAL SKIN OF A LAOTIAN WOMAN: A CASE REPORT

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Abstract. Gnathostomiasis caused by infection with the Spirurine nematode, Gnathostoma species, is a common fish-borne parasitic zoonosis in Asia. We present here the case of the spontaneous emergence of an adult Gnathostoma spinigerum worm from the abdominal skin of a Laotian woman. We review the literature on gnathostomiasis and discover that infective G. spinigerum larvae can grow into immature and mature worms in humans more commonly than expected.

Keywords: Gnathostoma spinigerum, adult worm, skin lesion, spontaneous emergence

INTRODUCTION

Gnathostomiasis is a disease caused by the nematode parasites belonging to the genus Gnathostoma (Nawa et al, 2015). It is a disease primarily of the skin and less frequently of the visceral organs (Nawa et al, 2015). The third stage larvae (L3) of Gnathostoma migrate through the tissues of the human body, preferentially to the skin, causing acute and chronic inflammation (Nawa et al, 2015). Human infection occurs when people ingest the intermediate/paratenic hosts harboring Gnathostoma L3 (Nawa et al, 2015). Countries endemic for gnathostomiasis are found in Asia and Latin America, where people have a custom of eating raw or undercooked fish or amphibians (Nawa et al, 2015).

It is generally believed humans are not suitable definitive hosts for Gnathostoma species; L3 ingested by humans usually do not develop into adult worms (Nawa et al, 2015). Recovery of Gnathostoma adult worms from humans has been reported occasionally (Daengsvang, 1980; Miyazaki, 1991). We report here the case of the spontaneous emergence of an adult Gnathostoma worm from the abdominal...
CASE REPORT

A 32 year old Laotian female office worker living in Vientiane Province, Lao PDR presented to Mahosot Hospital, Vientiane, on 18th August 2007 complaining of a pruritic, painful serpiginous lesion on the skin of the anterior abdomen (Fig 1) for several weeks. Before admission, the patient ate “Koi Plar”, a local dish prepared with minced raw fish and spices marinated in lime juice. Although other family members also had this dish, none of them developed clinical symptoms. She has no history of any major medical problem. In the hospital, while waiting to be examined, a worm emerged through the skin of the anterior abdominal wall. On examination, the patient was noted to have a superficial serpiginous track on skin of a Laotian woman. The parasite was identified morphologically and molecularly as a young adult G. spinigerum worm. We review the literature for cases where adult Gnathistoma worms are recovered from humans.

examination. Examination of the worm revealed it was 3 x 9 mm (Fig 2). Morphology under microscopy revealed the head bulb and the neck were buried in the body, with
Fig 3—High power view showing characteristic features of a *Gnathostoma spinigerum* adult worm. A, head bulb having 8-9 rows of hooklets, scale bar = 100 µm. B-C, transitional morphological changes of the cuticular spines from tridental (B), bifurcated (C) to single (D) spines on the anterior half of the worm body, scale bar = 50 µm.

5-6 lines of hooklets visible (Fig 3). The anterior half of the body was covered with cuticular spines and those on the anterior-most part had a tridental shape, consistent with an adult *G. spinigerum* worm.

To identify the species, polymerase chain reaction (PCR) sequencing was carried out as described previously (Ando *et al.*, 2006). DNA was extracted from a small piece of the tail of the worm, and the ribosomal internal transcribed spacer 2 (ITS2) sequence was amplified using a primer set for the LC1 (forward) and HC2 (reverse) sequences. A partial sequence of mitochondrial cytochrome oxidase 1 (Cox1) was also amplified using a primer set of the FH5 (forward) and MCO1B (reverse) sequences. The PCR conditions followed to those described previously examined was a 99.7% (389/390) match with the sequence accession number AB180099 (*G. spinigerum* Cox1 gene) in the GenBank, and ITS2 was a 99.5% (601/604) match with sequence accession number AB181155 (*G. spinigerum* ITS2 sequence) in the GenBank, confirming the study worm was *G. spinigerum*. After the worm spontaneously emerged, the skin lesion gradually disappeared and no recurrent symptoms occurred. The patient did not receive any further medical treatments.

**DISCUSSION**

The spontaneous emergence of a *Gnathostoma* worm can occasionally be seen after anthelminthic treatment (Suntharasamai *et al.*, 1992). Even without drug treatment, spontaneous emergence of
Gnathostoma worms have been reported from time to time. Kagen et al (1984) reported a case similar to ours: a 25 year old Laotian female immigrant to the US scratched a pruritic patch on the skin of her abdomen and removed a 1 cm long worm, identified as an immature female G. spinigerum worm. Samarasinghe et al (2011) described 2 cases from Sri Lanka: one where an adult worm emerged from the skin of the back, and another where it emerged from the skin of a finger. Subhedar et al, (2014) reported a case from India where an adult G. spinigerum worm emerged from the skin on the palm of the hand. Beside the skin, an adult Gnathostoma worm was reported twice in the urine of Laotian immigrants (Horohoe et al, 1984; Norcross et al, 1992).

As for the stage of the development of Gnathostoma worms at the time of diagnosis, we conducted a search on the literature to determine the maturation stages of Gnathostoma worms were. In 1934 from Thailand, Prommas and Daengsvang (1934) reported 9 cases of gnathostomiasis; all the worms isolated were adult male G. spinigerum worms. An immature male G. spinigerum worm was found in a surgical specimen from a male Thai patient presenting with acute ileus in Kuwait (Hira et al, 1989). A male G. spinigerum worm was recovered from the brain of a Thai woman in Korea suffering from meningoencephalitis (Lee et al, 1988). Jongthawin et al (2015) reported three cases of molecularly diagnosed gnathostomiasis in Thailand and adult G. spinigerum worms were identified in two cases. Miyazaki and Kikuchi (1954) reported the first case of an adult G. spinigerum worm from a woman in Japan, Ando (2003) reviewed a series of 103 gnathostomiasis cases diagnosed based on the morphology of surgically removed or spontaneously appearing worms and found 57 of the 103 cases were infection with G. spinigerum, 20 (35%) either immature or mature adult worms. These suggest that G. spinigerum L3 larvae can grow into immature/mature worms in humans more frequently than we expected.

Lao PDR is a high risk country for gnathostomiasis: gnathostomiasis cases have been reported among Laotian immigrants in the US (Stowens and Simon, 1981; Kagen et al, 1984; Horohoe et al, 1984; Norcross et al, 1992), in Germany (Hennies et al, 2006) and France (Chabasse et al, 1988). A seroepidemiological survey of gnathostomiasis in Lao PDR revealed a prevalence rate of 47% in Vientiane, the Capital, and 39% in Champasak in southern Lao PDR (Vonghachak et al, 2010). These suggest gnathostomiasis is a public health problem in Lao PDR. Gnathostomiasis control and prevention programs need to be developed and implemented for Lao PDR.

REFERENCES


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An Adult Gnathostoma Worm Emerged from a Laotian Woman


