



## RESEARCH ARTICLE

# Imported case of *Leishmania tropica* cutaneous leishmaniasis in a 10-year-old child in Malaysia

Tan, T.K.<sup>1\*</sup>, Yap, N.J.<sup>1</sup>, Leong, K.F.<sup>2</sup>, Teh, C.S.<sup>2</sup>, Tay, S.T.<sup>3</sup>, Lim, Y.A.L.<sup>1\*</sup>

<sup>1</sup>Department of Parasitology, Faculty of Medicine, Universiti Malaya, Kuala Lumpur, Malaysia

<sup>2</sup>Pediatric Institute, Kuala Lumpur Hospital, Kuala Lumpur, Malaysia

<sup>3</sup>Department of Medical Microbiology, Faculty of Medicine, Universiti Malaya, Kuala Lumpur, Malaysia

\*Corresponding author: tantk@um.edu.my; limailian@um.edu.my

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### ABSTRACT

The present paper reported a first imported case of cutaneous leishmaniasis in a 10-year-old child who returned from Saudi Arabia to Malaysia. Six weeks after his travel to Malaysia, two erythematous dermal nodules were developed over his right cheek and chin. Occurrence of intracellular amastigote of *Leishmania* was observed through examination of skin biopsy with hematoxylin and eosin stain. Furthermore, molecular analysis of ribosomal internal transcribed spacer 1 (ITS1) of *Leishmania* spp. confirmed the child was infected with *Leishmania tropica*. The child was given oral fluconazole and he had a 80% recovery before he went back to Saudi Arabia.

**Keywords:** Cutaneous leishmaniasis; *Leishmania tropica*; imported case; ITS-1.

### INTRODUCTION

Leishmaniasis is a tropical and subtropical disease caused by protozoan *Leishmania* spp. and transmitted by bites of infected female phlebotomine sand flies. It is categorized as one of the most neglected tropical diseases, with a presence in approximately 98 countries of the world. It has an annual incidence of over 1.3 million new cases and an estimated 350 million people are at risk of infection (Burza *et al.*, 2018). There are three main clinical forms of the disease: cutaneous leishmaniasis (CL), visceral leishmaniasis (VL) and mucosal leishmaniasis (ML). CL is the most common form of leishmaniasis and causes skin sores, while VL affects several internal organs (usually spleen, liver, and bone marrow) and can be life-threatening due to the absence of rapid diagnostic tests or timely treatment (Torres-Guerrero *et al.*, 2017).

Leishmaniasis is not common in Malaysia. However, increased global travel and migration of immigrant workers has contributed to the growing concern of imported leishmaniasis (Rahman & Abdullah, 2011; Noor Azian *et al.*, 2016). Here, we report a case of CL who presented to the Pediatric Dermatology Clinic of a governmental hospital in Kuala Lumpur, Malaysia after his trip to his home country, the Kingdom of Saudi Arabia.

#### Case

In October 2020, a 10-year-old child travelled with his family from home country, Saudi Arabia to Malaysia. Six weeks after his travel, two painless erythematous dermal nodules were noticed on his right cheek and chin. Three courses of systemic

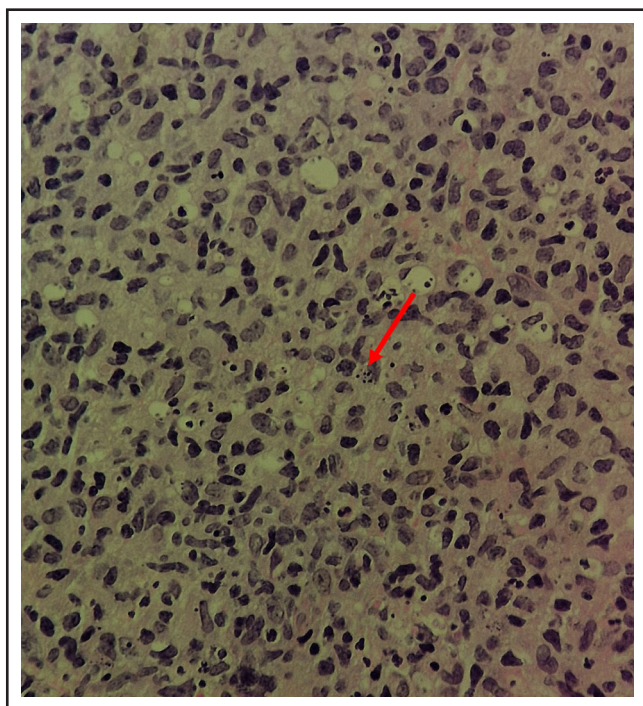
antibiotics (i.e., cefuroxime, augmentin, and erythromycin) were given to the child by his primary care physician, but the nodules persisted.

The child was then admitted to the Pediatric Dermatology Clinic of Kuala Lumpur Hospital, Malaysia. Based on the observation, two erythematous dermal nodules measuring 3×2.5cm were noted over his right cheek and chin (Figure 1). These lesions were not ulcerated and non-tender upon gentle palpation. The overall systemic examination was normal and no palpable cervical lymph node was noted.



**Figure 1.** Two erythematous dermal nodules measuring 3.0×2.5cm were noted over his right cheek and chin.

## DISCUSSION



**Figure 2.** Dot-shaped intracellular organisms of amastigote of *Leishmania* (red arrow) observed in the patient's skin biopsy with hematoxylin and eosin stain (40× magnification).

Histopathological analysis using hematoxylin and eosin staining on his erythematous dermal nodules/skin biopsy revealed the crusting of surface epidermis with hyperkeratosis, acanthosis and spongiosis. The scale crust was infiltrated by neutrophils. The dermis layer was also infiltrated by chronic inflammatory cells, such as lymphocytes, histiocytes, neutrophils, and plasma cells. The inflammatory reaction was noted in the superficial and deep dermis, extending deep into subcutaneous fat layer. Additionally, intracellular organisms, amastigotes of *Leishmania* were noted (Figure 2). Further examination with Grocott-Gomori methenamine silver and periodic acid-Schiff stains did not reveal any signs of fungal infection.

Subsequent confirmation was performed by amplifying the ribosomal internal transcribed spacer 1 (ITS1) of *Leishmania* spp. upon extracted DNA from a skin biopsy sample using primers LITSR (5'-CTGGATCATTTCCGATG-3') and L5.8S (5'-TGATACCACTTATCGCACTT-3'), as described by El Tai et al. (2001) and Schonian et al. (2003). Amplicon was subjected to bidirectional DNA sequencing using ABI PRISM 377 Genetic Analyzer (Applied Biosystems, Inc, Foster City, CA, USA). The obtained sequence chromatogram was viewed and analyzed with ChromasPro 1.5 (Technelysium Pty Ltd., Qld, Australia). The consensus sequence [GenBank Accession Number: OL413438] showed 99.4% homology to *Leishmania tropica* (GenBank Accession Number: FN677341) isolated from a human clinical sample in Israel (Odiwuor et al., 2011). Molecular detections of bacterial and fungal agents were attempted using established PCR protocols targeting the bacterial 16S rRNA gene (Lane et al., 1985) and fungal internal transcribed spacer gene region (White et al., 1990); however, no amplification product was obtained for further analysis.

Given that intralesional sodium stibogluconate is not available in Malaysia, thus the patient was given oral fluconazole at 6-9 mg per kg per day for 12 weeks. The patient had recovered 80% before he went back to Saudi Arabia.

Malaysia is a non-endemic country to leishmaniasis and there has been no local transmission documented, however, imported leishmaniasis cases from endemic countries could be one of the major concerns to the disease control and prevention.

This paper reported an imported CL from Saudi Arabia to Malaysia where the patient was positive to *L. tropica* based on clinical observation, microscopy examination and sequencing analysis of the ITS1 DNA region. The human CL could be caused by more than ten *Leishmania* species (Bailey & Lockwood, 2007), of which *L. tropica* and *L. major* are the main causative agents in Saudi Arabia, though the former is less prevalent compared to the latter (Abass et al., 2020). *Leishmania tropica* tends to be an anthroponotic pathogen in Saudi Arabia while *L. major* is mainly found in animals such as rodents (Abuzaid et al., 2017). Indeed, several countries have reported imported CL cases from Saudi Arabia, for example, imported of *L. tropica* to a *L. major* endemic country, Egypt by a 27-year-old male who worked in Saudi Arabia (Mohareb et al., 1996); *L. tropica* from a Bangladeshi migrant worker in Bangladesh (Rahman et al., 2014); and a Chinese worker who returned from Saudi Arabia to China (Zhang et al., 2016). These cases highlighted that the lesions usually appeared on uncovered regions, such as face, elbows and limbs, where the regions can be accessed easily by sandflies.

Apart from the present report, VL is the only imported disease caused by *Leishmania* spp. in Malaysia, most of which were detected in foreign workers. These include a case of VL in a Bangladeshi migrant tested seropositive to leishmaniasis upon his admission to hospital due to high swinging fever, chest pain and substantial weight loss (Kamarulzaman & Khairul Anuar, 1998). Co-infection of VL and malaria (i.e., *Plasmodium vivax*) was also reported in a Nepalese construction worker (Rahman & Abdullah, 2011). Furthermore, a large-scale antibody-seroprevalence study of leishmaniasis involving over 2000 serum samples collected from Bangladesh, Nepal, India, Myanmar, Vietnam and Indonesian migrant workers revealed 55.3% of them were seropositive, of which Nepalese reported the highest prevalence rate (68.6% of 201) (Noor Azian et al., 2016). These research and reported cases in Malaysia highlighted the importance of surveillance of transmissible diseases among the immigrants.

Cases of imported leishmaniasis in non-endemic countries with recorded potential *Leishmania* vectors raise concerns of the possibility of local transmission. *Leishmania* is transmitted by the female phlebotomine (i.e., *Phlebotomus* and *Sergentomyia*) sand flies (Jacobson, 2003; Srinivasan et al., 2016). In Malaysia, several *Phlebotomus* (e.g., *P. argentipes*) and *Sergentomyia* (e.g., *S. gemmea*) species were recorded in forested areas (i.e., limestone areas and caves) in Western Malaysia (Shahar et al., 2011). Among the reported sand-fly species in Shahar et al. (2011), *Phlebotomus argentipes* and *Sergentomyia gemmea* are the known vectors for *Leishmania donovani* in India (Srinivasan et al., 2016) and potential vectors for *Leishmania simensis* in Thailand (Kanjanopas et al., 2013), respectively. In addition, human biting behavior of *P. argentipes* was also observed (Shahar et al., 2011), highlighting its role in disease transmission.

In conclusion, the present study reported an imported case of *L. tropica* CL in Malaysia. Imported cases of non-endemic infectious or vector borne diseases from endemic countries is one of the major concerns of disease control and prevention. Therefore, regular screening of

leishmaniasis among immigrants and pathogen detection in Malaysian sand flies would assist in disease monitoring and early prevention.

#### Conflict of interest

The authors declare that they have no conflict of interest.

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