

- Pettoello, M., Nocerino, A., Gradoni, L. & Gramiccia, M. (1988). Leishmaniosi viscerale (L.V.): recenti casi di resistenza alle comuni terapie farmacologiche in Campania. *Rivista Italiana di Pediatria*, **14** (supplement 1), 7-8.
- Chulay, J. D., Bhatt, S. M., Muigai, R., Ho, M., Gachihi, G., Were, J. B. O., Chunge, C. N. & Bryceson, A. D. M. (1983). A comparison of three dosage regimens of sodium stibogluconate in the treatment of visceral leishmaniasis in Kenya. *Journal of Infectious Diseases*, **148**, 148-155.
- Chulay, J. D., Fleckenstein, L. & Smith, D. H. (1988). Pharmacokinetics of antimony during treatment of visceral leishmaniasis with sodium stibogluconate or meglumine antimoniate. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, **82**, 69-72.
- Chunge, C. N., Gachihi, G., Muigai, R., Wasunna, K., Rashid, J. R., Chulay, J. D., Anabwani, G., Oster, C. N. & Bryceson, A. D. M. (1985). Visceral leishmaniasis unresponsive to antimonial drugs. III. Successful treatment using a combination of sodium stibogluconate plus allopurinol. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, **79**, 715-718.
- Gradoni, L., Gramiccia, M., Pettoello, M., di Martino, L. & Nocerino, A. (1987). A new *Leishmania infantum* enzymatic variant, agent of an urban visceral case unresponsive to drugs. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, **81**, 927-928.
- Gramiccia, M., Gradoni, L. & Pozio, E. (1986). Caractérisation biochimique de souches du complexe *Leishmania infantum* isolées en Italie. In: *Leishmania. Taxonomie et phylogénèse. Applications écoépidémiologiques*. (Colloque interne CNR/INSERM, 1984), Rioux, J. A. (editor). Montpellier: IMEEE, pp. 445-454.
- Mokrani, T., Belazzoug, S., Bouzid, Z. & Keddari, M. (1988). Evolution des anticorps chez des enfants traités pour leishmaniose viscerale. *Archives de l'Institut Pasteur d'Algérie*, **56**, 101-107.
- Pampiglione, S. & Bettini, S. (1981). Bibliografia Italiana delle leishmaniosi. *Annali dell'Istituto Superiore di Sanità*, **17**, 1-150.

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## Short Report

### A case of diffuse cutaneous leishmaniasis due to *Leishmania major*

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Recently, severe outbreaks of cutaneous leishmaniasis have been reported in the central and northern Sudan. The clinical picture and epidemiological pattern in these outbreaks conform to the classical description of zoonotic cutaneous leishmaniasis and the parasite isolates have been identified as *Leishmania major* (EL SAFI *et al.*, 1988). In the present report we describe a case of diffuse cutaneous leishmaniasis (DCL) due to *L. major* acquired in the course of the recent epidemic in the central Sudan.

#### Case report

**History and clinical examination.** A 35 years old Sudanese male presented to the Dermatology Clinic of Wad Medani Teaching Hospital complaining of multiple skin lesions in the right lower limb and swelling of the right lower limb and the scrotum. The swelling appeared 10 years ago following an attack of bilateral inguinal lymphadenitis. The skin lesions first appeared on the right leg and gradually spread over the right lower limb and the left thigh. Physical examination showed lymphoedema of the right lower

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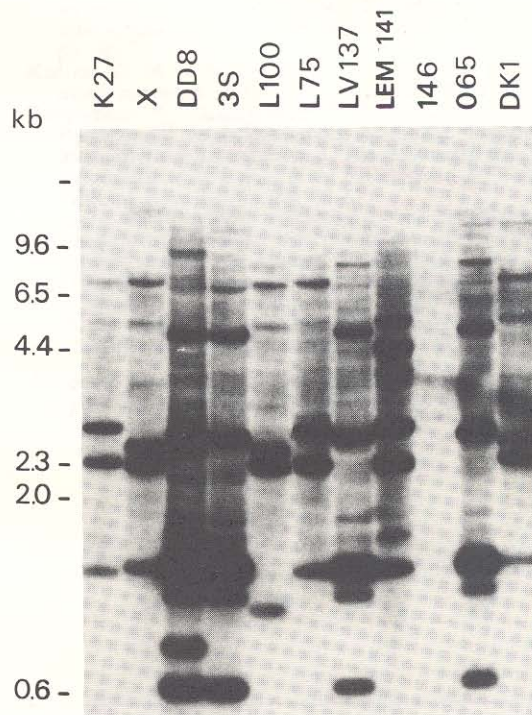


Figure. Autoradiograph of a Southern blot of leishmanial DNA digested with endonuclease *Pst* I and hybridized with probe 7-059. The strain isolated from the patient described is labelled X. DK1 (MHOM/SN/OO/DK1) is a Senegalese strain isoenzymatically identical with the World Health Organization WHO reference strain of *Leishmania major*. (WHO) reference strains of *L. tropica* (K27), *L. donovani* (DD8) and *L. aethiops* (L 100) are included. Also shown are other strains of *L. tropica* (L 75, LEM 141), *L. donovani* (3S, 065, LV 137) and *L. adleri* (146); kb=kilobases.



limb and a huge lymph-scrotum. The skin over the thighs was covered with papules 0.5–1.5 cm in diameter.

**Histopathology.** Tissue was taken by biopsy from the skin lesions on the right thigh and sections were stained with haematoxylin and eosin, Giemsa's, and Ziehl-Neelsen stains. The sections showed areas of histiocytic clusters rich in amastigotes. These clusters were surrounded by areas of plasma cell and lymphocytic infiltration and scanty amastigotes.

**Leishmanin test.** The antigen suspension was prepared and processed by the technique of PAMPIGLIONE *et al.* (1975), using a strain of *L. donovani* (zymodeme LON 48) as source of promastigotes. The test was performed by injecting 0.1 ml of antigen suspension (test) or 0.1 ml of 0.5% phenol (control). The 2 injections were inoculated 10 cm apart on the volar surface of the forearm. The test was negative at 48 and 72 h.

**Isolation and characterization of the parasite.** Needle aspirate from the cutaneous lesions was inoculated into modified NNN medium for primary culture. Parasites were grown in mass culture and deoxyribonucleic acid (DNA) was isolated as previously described (VAN EYS *et al.*, 1989). The DNA was digested with endonuclease *Pst* I and fragments were separated on a 0.7% agarose gel. The DNA was blotted on nitrocellulose (SOUTHERN, 1975) and hybridized with several recombinant probes, in particular 7-059 (VAN EYS *et al.*, 1989). The banding pattern indicated that the isolate was *L. major* (Figure).

**Clinical course and management.** The patient was given sodium stibogluconate (Pentostam®) at a dose of 10 mg/kg intravenously daily for 14 d. The skin lesions showed some regression, with amastigotes still seen at the end of the course. Marked regression of the skin lesions was achieved by repeating this treatment regimen.

#### Discussion

The present case is the first report of DCL in Sudan. Characterization of the isolate by Southern blotting identified the isolate as *L. major*. The fact that the patient had pre-existing lymphoedema at the

site of the initial lesion strongly points to impaired lymphatic drainage as a predisposing factor in the pathogenesis of his condition. BRYCESON (1970) found that a significant number of cases of Ethiopian DCL had abnormalities of the lymphatics in the lower limbs, suggesting that damage of the lymphatics may impair cell-mediated reaction to the parasite, which multiplies to reach levels sufficient to produce high zone tolerance. This hypothesis is supported by experiments in which disseminated lesions were produced in guinea-pigs by inoculation of *L. enriettii* in skin flaps with impaired lymphatic drainage (KADIVAR & SOULSBY, 1975). Although there is a large body of evidence indicating the importance of intrinsic parasite characteristics in the aetiology of DCL, the present case provides evidence supportive of the role of host aberration in the aetiology of this abnormal form of cutaneous leishmaniasis.

#### References

- Bryceson, A. D. M. (1970). Diffuse cutaneous leishmaniasis in Ethiopia IV. Pathogenesis of DCL. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, **64**, 387–393.
- El-Safi, S. H., Peters, W. & Evans, D. (1988). Current situation with regard to leishmaniasis in Sudan, with particular reference to the recent outbreak of cutaneous leishmaniasis in Khartoum. In: *Research on Control Strategies for the Leishmaniases*, Walton, B. C., Wijeyaratne, P. M. & Modabber, F. (editors). Ottawa: International Research and Development Corporation, pp. 60–77.
- Kadivar, D. M. & Soulsby, E. (1975). Model for disseminated cutaneous leishmaniasis. *Science*, **190**, 1198.
- Pampiglione, S., Manson-Bahr, P. E. C., La Placa, M., Borgatti, M. A. & Musumeci, S. (1975). Studies in Mediterranean leishmaniasis 3. The leishmanin skin test in kala-azar. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, **69**, 60–67.
- Southern, E. M. (1975). Detection of specific sequences among DNA fragments separated by gel electrophoresis. *Journal of Molecular Biology*, **98**, 503–517.
- Van Eys, G. J. J. M., Schoone, G. J., Ligthart, G. S., Alvar, J., Evans, D. A. & Terpstra, W. J. (1989). Identification of 'old world' *Leishmania* by DNA recombinant probes. *Molecular and Biochemical Parasitology*, **34**, 53–62.

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