Mycobacterium ulcerans infection: a rediscovered focus in the Capricorn Coast region of central Queensland

Glenn Francis, Michael Whitby and Marion Woods

TO THE EDITOR: *Mycobacterium ulcerans* is an environmental pathogen with a global geographic distribution and focal disease clusters. The World Health Organization considers *M. ulcerans* infection to be of increasing global importance, particularly in West Africa.

In Australia, the clinical and pathological features were fully described in 1948, when the disease was named Bairnsdale ulcer.¹ Since then, the number of cases has increased, and new focal areas continue to emerge around southern coastal Victoria.² In Queensland, the disease is most frequently reported in the Mossman area (north of Cairns in north Queensland), where it is known as Daintree ulcer.³ However, the organism is probably more widely distributed.

We describe four patients recently diagnosed with proven *M. ulcerans* infection in the Capricorn coast region of central Queensland (Box). The suspected epicentre of infection is around Yeppoon, approximately 1000 km south of Mossman.

None of the patients had significant contact with recognised endemic areas in north Queensland or Victoria. Patient 1 had visited Townsville in July 2000, but had minimal contact with the natural environment. She undertook extensive gardening at her home in North Rockhampton, using sugar cane bagasse mulch from north Queensland. The previous occupants of her house had

lived in north Queensland and left behind at her home numerous potted plants originally from that area. However, investigation of soil from potted plants, gardens and roses at the home using polymerase chain reaction (PCR) failed to detect any evidence of *M. ulcerans*.

Patient 2 lived near a coffee plantation originally planted with seeds transported from north Queensland. Sampling of plants and soil in the area by PCR revealed no atypical mycobacteria.

M. ulcerans is an environmental organism associated with bodies of water, but its specific ecological niche is unknown.⁴ The organism is difficult to culture from the environment but has been identified by PCR in water, biofilms, aquatic insects, snails and fish. The mode of transmission to humans remains unknown. It has shown a marked propensity for causing intense focal outbreaks in Victoria (Phillip Island and Point Lonsdale) and Queensland (Daintree region).

The recognition that *M. ulcerans* occurs in coastal central Queensland is important, as early diagnosis of *M. ulcerans* infection minimises the extent of tissue debridement necessary and improves outcomes. The patients we describe had complicated disease requiring multiple debridements and, in one case, amputation. Awareness of the possibility of *M. ulcerans* infection is critical, as diagnosis by PCR is straightforward once the infection is considered in the differential diagnosis.

In 1942, Cilento described possible *M. ulcerans* infections from around Rockhampton.⁵ Four other culture-confirmed cases were reported between 1957 and 1962 from the Glass House Mountains (Sunshine Coast)³ and Maryborough (Fraser Coast)⁶⁻⁸ regions in Queensland. Our four cases

Four patients with *Mycobacterium ulcerans* infection in central Queensland

Age/sex	Location	Presentation	Site	Clinical features	Diagnosis	Treatment
47 F	North Rockhampton	Sep 2000	Fifth finger (left hand)	Nodule	Histology, PCR	Debridement, antimycobacterial antibiotics, amputation
33 F	Yeppoon	Jun 2003	Left knee	Ulcer	Histology, culture	Debridement
64 M	Bungundarra	Aug 2004	Right elbow	Ulcer	Histology, PCR	Multiple debridements
18 M	Keppel Sands	Nov 2004	Right knee	Ulcer	Histology, culture	Multiple debridements, antimycobacterial antibiotics

PCR = polymerase chain reaction. F = female. M = male.

occurred within a small geographic area centred on Yeppoon and the suburbs of Rockhampton. If the cases previously described by Cilento were truly related to *M. ulcerans*, then there appears to have been a five-decade gap in identification of *M. ulcerans* infection in the Capricorn Coast region of central Queensland. Possible explanations for this include low organism numbers resulting in sporadic infection, focal concentrations of the organism with environmental changes, such as development, land clearing and cultivation modifying human contact, or failure to diagnose the condition. Patients who acquired the infection in central Queensland may also have been diagnosed outside the area.

The increase in cases in Victoria raises the possibility of a potentially similar dramatic increase in cases in central Queensland. Consideration should be given to making *M. ulcerans* infection a reportable disease to enable monitoring.

Glenn D Francis, Director, Department of Pathology¹

Michael Whitby, Director, Infection Management Services¹

Marion Woods, Infectious Diseases Physician²

¹ Princess Alexandra Hospital, Brisbane, QLD.

² Royal Brisbane Hospital, Brisbane, QLD.

glenn_francis@health.qld.gov.au

1 Macallum P, Tolhurst JC, Buckle G, Sissions HA. A new mycobacterial infection in man. *J Pathol Bacteriol* 1948; 60: 93-122.

2 Johnson PD, Veitch MG, Leslie DE, et al. The emergence of *Mycobacterium ulcerans* infection near Melbourne. *Med J Aust* 1996; 164: 76-78.

3 Radford AJ. *Mycobacterium ulcerans* in Australia. *Aust N Z J Med* 1975; 5: 162-169.

4 Roberts B, Hirst R. Immunomagnetic separation and PCR for detection of *Mycobacterium ulcerans*. *J Clin Microbiol* 1997; 35: 2709-2711.

5 Cilento R. Leprosy (elephantiasis graecorum). In: Tropical diseases in Australasia. Brisbane: WR Smith and Paterson, 1944: 306.

6 Annual report of the health and medical services of the State of Queensland for the year 1957-58. Brisbane: SG Reid, Government Printer, 1958: 95.

7 Annual report of the health and medical services of the State of Queensland for the year 1958-59. Brisbane: SG Reid, Government Printer, 1959: 95-97.

8 Lane D. *Mycobacterium ulcerans* infection in Queensland. *Med J Aust* 1964; 1: 124-125. □