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CASE REPORT

# Necrotising fasciitis and cellulitis after traditional Samoan tattooing: case reports

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**Summary** Traditional Samoan tattooing, ta tatau, is a vital part of Samoan culture. It is being performed with greater frequency on New Zealand resident Samoans. Unfortunately, ta tatau has recently been the causal factor in two significant infectious cases, in one of which death resulted. The two cases were clinically reviewed. An investigation into the history and practice of ta tatau was made in an attempt to identify causal factors that could be addressed. The two cases had similar causal themes. These included improper sanitary techniques, ta tatau being performed in unlicensed premises by temporary tattooists, patients that were unwilling to access medical services due to the expectations of tradition, lack of follow-up and lack of infection advice by the tattooist. Life threatening infectious complications has not previously been described for traditional Samoan tattooing. Improper sanitary conditions in combination with late presentation to medical services have been suggested as the cause of these cases. The technique, tools, culture and trends are discussed and recommendations are made for reducing infectious complications.


## Case reports

### Case 1

A 45-year-old Samoan ex-patriot male was admitted to hospital two days after completion of traditional Samoan tattooing. The tattoo circumferentially covered his body from his waist to his knees. The tattoo was performed over a four-day period by a Samoan master tattooist visiting New Zealand. The legs were tattooed after the peri-anal region using the same tools in the same session. He had experienced increasing pain, redness and swelling of both thighs for 48 h and fever, rigors and decreased urine output for 24 h prior to admission. At the Emergency Department he was diagnosed with septic shock secondary to bilateral lower limb cellulitis. Intravenous flucloxacillin and penicillin was started. Inotropic support was initiated when the hypotension did not respond to fluid

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resuscitation. Blood tests showed normal electrolytes, renal function and coagulation, but decreased white cell count ($3.7 \times 10^9$/l) and thrombocytopenia ($116 \times 10^9$/l). He was also noted to have raised creatine kinase, troponin T and had ECG changes consistent with an acute myocardial infarction. Necrotising fasciitis was suspected. He was transferred to the intensive care unit for ongoing inotropic support before being taken to theatre for emergency debridement. Tissue Gram-stains showed numerous Gram-positive cocci and Clindamycin was administered. Bacterial cultures grew *Staphylococcus aureus*, *Streptococcus pyogenes* and *Pseudomonas aeruginosa*, and cefepime was then added to the antibiotic regime. He had further debridements with a skin defect of 12% body surface area. He was discharged from the Intensive Care Unit on post-admission day six. He had a further debridement on post-admission day nine, which revealed intact and viable fascia. Definitive wound closure was gained by split skin grafting. In an attempt to conceal the lower limb defects the remaining viable tattooed areas were used as the skin graft donor sites. The skin grafts were then orientated in the defects to blend in with the remaining tattoo. He was discharged home 25 days after admission. Wounds have remained healed with stable grafts at follow-up 3 months after discharge. Scarring was adequate with pressure garment scar management. He will not seek further tattooing.

## Case 2

A 29-year-old male presented to the Emergency Department with malaise, fever and bilateral thigh pain. He gave a history of sequential traditional tattooing to his lower trunk and bilateral thighs over the previous week. He did not had any tattooing in the previous 48 h. These tattoos became infected and he became increasingly unwell over this period. On examination, he was febrile, hypotensive and had necrotic skin with surrounding inflammation and spreading epidermolysis over both anterolateral thighs (Fig. 1). He was diagnosed with a necrotising soft tissue infection and septic shock. Resuscitation was followed by a cardiac arrest in the Emergency Department, which responded to routine Advanced Cardiac Life Support management. He was immediately transferred to the operating theatre. Intraoperative findings were localised skin necrosis and superficial infection of the anterolateral thighs with widespread necrotising fasciitis of both lower limbs. The foci for the necrotising fasciitis were the iliotibial tracts bilaterally. Radical debridement was performed involving approximately 20% total body surface area. He required ionotropic support as well as intraoperative dialysis. During the debridement his ventilation pressures increased and a decompressive laparotomy was performed for an abdominal compartment syndrome. Tissue from the debridement showed Gram-positive cocci on Gram-stain. The tissue microbiology cultures from the Emergency Department swabs grew *S. pyogenes* and *S. aureus*. The tissue cultures also grew *Corynebacterium* species and *Klebsiella oxtoca*. He was transferred to the Intensive Care Unit but died later the same day. A post mortem examination revealed an otherwise healthy young man with no residual skin or subcutaneous infection but evidence of septicaemic shock. The principle cause of death was acute heart failure, due to or as a consequence of septicaemic shock, due to or as a consequence of ritual cutaneous tattooing. The tattoo equipment box was examined and had all its contents swabbed, including the tattoo combs and mallets, a banana leaf, razors, a bottle of Dettol, the instrument tin and lining, yellow pigment (turmeric) and ink. All of these objects grew various quantities of mixed Gram-positive organisms. The most extensive growth was from the ink and the yellow pigment, and the organisms cultured were identified as aerobic spore producing bacilli.

**Figure 1** Case 2 on presentation to the Emergency Department. Note the bilateral thigh skin necrosis and mottled erythema over the remainder of the tattooed skin.