

A patient's perspective on his military and civil post-trauma wound care treatment

KEY WORDS

- ▶ Post-trauma wound care
- ▶ Military veterans
- ▶ Amputation wound
- ▶ Osteomyelitis
- ▶ Chronic regional pain syndrome

Michael's wound care journey started with an ill-fated parachute landing during an army parachute training exercise in Cyprus in January 2012. As he came in to land, a crosswind caught him, throwing him to the ground and causing an open complex fracture to his tibia and fibula. Mike's fractures turned into a series of challenges that included several rounds of surgery and injuries that became life changing. In this article, Michael describes his experience of treatment by specialist military trauma services, a veteran's charity and his local NHS wound care team.

Initially, Michael's injuries seemed to be healing, after his leg was operated on and plated in Cyprus. Yet as Michael's open fracture had been exposed to the elements for over 2 hours while he waited for the military ambulance, he later developed osteomyelitis of the tibia. Osteomyelitis, a bone infection, is a common complication of complex fractures. Despite his fractures initially healing following several rounds of trauma orthopaedic surgery, he experienced four further episodes of osteomyelitis. He received further surgery and treatment for his osteomyelitis, which included removing the metal work, intensive antibiotic therapy, radical debridement, inserting bone grafts and an external fixation cage to aid bone healing. While this management regimen is sometimes successful, often it is not.

In May 2012, Michael's osteomyelitis appeared to be under control, enabling him to resume his life and work as a project manager in Iraq. However, in February 2015 he became ill again with another episode of osteomyelitis. The osteomyelitis had returned to Michael's tibia and fibula.

RECURRENT COMPLICATIONS

By the time Michael had returned to The Royal Centre for Defence Medicine (RCDM) in Birmingham, he was experiencing a debilitating post-trauma complication of his osteomyelitis and scarring, chronic regional pain syndrome (CRPS). In CRPS, the brain becomes programmed to pre-empt pain, causing an exaggerated pain

response. CRPS is extremely problematic in patient care and requires a specialist multidisciplinary approach, including management by pain and rehabilitation specialists. The military's vast experience of treating traumatic injuries has led them to develop extensive combination treatments, which include therapies and drugs for CRPS.

A pain consultant and occupational therapist looked after Michael, yet despite the therapies he received, most of his treatment reverted back to neuropathic pain medication, which had some serious side effects.

Michael's osteomyelitis relapse and the side effects from his medication put such a strain on him it led to him losing his job. On top of this, in September 2015, surgeons told Michael that if his infections and pain continued to recur, amputation might be the best option for improving his quality of life as it would remove the chances of reoccurrence. After much discussion, Michael agreed to undergo an elective above-knee amputation in October 2015.

When Michael had his amputation, the support the close friendship bonds that the military tends to build and, latterly, the veteran charity Woundcare4Heroes (WC4H), helped him navigate the changes and challenges involved.

POST-AMPUTATION WOUND CARE

Michael was discharged home a couple of weeks following his amputation, with advice to register



Figure 1. NPWT and closed circuit irrigation in situ



Figure 2. Post surgical wound closure



Figure 3. Healed scar line

with WC4H should any wound issues occur. Michael contacted WC4H between weeks three and four as his residual limb had become swollen, increasingly painful, and it had small exit wounds opening on the staple line. Michael was due to have the staples removed the following day at his local NHS practice. However, the pain he was experiencing due to his CRPS meant he couldn't allow the district nurse to remove his staples.

WC4H made a rapid referral for Michael to the RCDM clinic and he was seen by military surgeons within 48 hours. Michael returned to theatre for staple removal and clearance of the infected tissue. The wounds were dressed with Kerlix and SurgiHoney by the specialist team, and Michael was referred back to WC4H for continued dressings management. The wounds responded well to the continued use of SurgiHoney and, after 2 weeks, they were displaying healthy granulation tissue and healing well by secondary intention. Michael returned to his rehabilitation and normal NHS care services. The decision was taken to stop using the SurgiHoney and apply the PICO device to close the remaining wound; it was hoped this would hasten healing and enable him to start rehabilitation.

Michael self-referred back to WC4H immediately following this change of treatment as the device exacerbated his CRPS; despite this, Michael decided to try the treatment for a couple of days. After one week, Michael contacted WC4H as his stump wound was closed but the area was throbbing, discoloured, breaking down and very painful. WC4H made a second rapid referral to RCDM surgeons and Michael was readmitted via clinic review then on to theatre.

Surgeons reopened his stump, trimmed his bone to alleviate closure tightness, and debrided his wound of devitalised tissue.

Postoperatively, Michael's wound received negative pressure wound therapy (NPWT) using a KCI V.A.C. Ultra device and closed pulsed irrigation with Octenilin wound irrigation solution (*Figure 1*). Every three hours, the sponge wound filler received 45 ml of irrigation solution, which remained there for 15 minutes. Michael experienced a complete reduction in his pain immediately following surgery. Michael's NPWT was redressed on day three and, on day six, he returned to theatre for surgical wound closure and a soft cloth postoperative dressing was applied (*Figure 2*). His wound had now completely healed (*Figure 3*). These dressings and treatments are all available on the NHS; however, local variation in formulary guidelines may make certain treatments difficult to obtain at local level, which can lead to patients being re-hospitalised or having prolonged hospitalization for the correct treatment.

EXPERIENCES OF BOTH EXEMPLARY TREATMENT AND CHALLENGES

Michael felt cared for by his local wound care staff despite them having less experience of his needs as a veteran with complex post-trauma injuries than the military specialists. His needs as a veteran required a: familiarity with chronic pain syndrome; technical understanding of what happens around the wound site; provision of specialist nurses experienced at amputation wound care; and reassurance of high-standard hygiene practice.

In one appointment with a locum practice nurse, Michael phoned WC4H when he noted the practice nurse had a dirty uniform and dirty nails, and was practising in an unclean and smelly room — Michael feared further wound infection, having already lost his limb to infection. WC4H felt the nurse had insufficient experience with military veterans and CRPS, and advised Michael that an appointment would be made for him to be seen in the RCDM clinic under the WC4H umbrella. In such situations, knowledge of CRPS and its impact on care delivery and overt emphasis on cleanliness can help, for example, nurses cleaning treatment surfaces in front of the patient and regularly stating to patients that they are washing their hands. In the end, Michael had to be anaesthetised to remove his staples due to the severity of his CRPS.

SUPPORT FROM WC4H FOR HEROES

WC4H serves as a specialist, year-round, single point of contact support service, which provides trauma aftercare for veterans of our armed forces. Importantly, WC4H provides rapid referrals for veterans to military trauma experts who practice slightly more specialist techniques than those typically available on the NHS. This urgency undoubtedly preserved Michael's residual limb.

WC4H's support for Michael included wound monitoring and regular dressing changes. WC4H trained Michael's partner to conduct the simple dressing changes, and they also assessed his residual limb through FaceTime. WC4H provided wound support both in person and via FaceTime.

Another important aspect of WC4H care is their on-going contact with veterans, which means veterans are on WC4H's radar for life, rather than discharging them after treatment is complete. The tenet of on-going WC4H care is preventative care, such as monitoring, protecting and preserving the vascular health of the residual limb — this ultimately cuts the cost of treating issues that may arise as potentially life-threatening emergencies, e.g. sepsis.

REHABILITATION

Rehabilitation after Michael's amputation was excellent and plentiful under military care. Michael



received three physiotherapy appointments per week for his prosthetics. Military veterans, such as Michael, tend to be sporty, and have slightly different needs for rehabilitation due to their high level of physical fitness.

TRAINING FROM WC4H FOR HEROES

WC4H shares its expertise in treating trauma wounds through conferences and local training projects. For example, the SOS clinical services project at the Sir Oswald Stoll Foundation in London, trains community staff to use a new device to manage lymphatic issues; the device was also funded by WC4H.

WC4H have plans to undertake a formal trauma aftercare project with Kings College, London, in which they aim to develop a centralised, single point of contact and triage pathway in the UK for both military and civilian post-trauma patients. Ultimately, the role of specialist tissue viability nurse was developed from different wound care needs, ranging from prevention and management of pressure ulcer, to more complex chronic wound conditions. However, trauma patients with burns, scars, tissue, muscle and bone loss, plus other underlying unique microbiological factors, require a very different specialised approach. Many tissue viability nurses express their thirst for knowledge around trauma wounds and WC4H have a large turnout to their trauma wound training sessions.

