

Wound debridement with the VERSAJET Hydrosurgery system: a novel technique available at Strömsholm Equine Hospital

Time spent in wound preparation is never wasted, and failure to lavage and debride the wound fully at initial examination is a common cause of failed/delayed healing. Traditional sharp debridement commonly results in the development of multiple tissue planes that are either too deep, thereby unnecessarily removing viable tissue, or too shallow, leaving necrotic tissue that must be removed at a second debridement. High pressure lavage has the disadvantage of potentially driving contaminated material further into the wound and overhydrating the tissue.

The VERSAJET (VJT) Hydrosurgery system has been developed for both acute and chronic wound debridement. It consists of a power console and reusable handpiece (Figure 1). The console is foot pedal activated and utilises sterile fluid bags for irrigant and a standard waste receptacle for effluent. The system utilises a high velocity stream of sterile saline, which jets across the operating window of the handpiece. This creates a localised vacuum (*venturi effect*) enabling the surgeon to hold, cut, and remove damaged tissue and contaminants, whilst simultaneously irrigating the wound (Figure 2). Moreover, the VJT provides immediate fluid evacuation, and so there is minimal saturation of the operative field. Handpiece orientation relative to the tissue determines the effect. In addition to altering orientation, depth and speed of debridement can be adjusted using the variable power settings.

In human medicine, the system has been used successfully in the debridement of damaged and necrotic tissue in traumatic wounds, chronic wounds such as venous ulcers, and burns (Figure 3). In a pilot study, the use of the VJT was compared with sharp debridement and pulsatile lavage in patients with open soft tissue or fracture wounds. There was the suggestion that the VJT resulted in fewer debridement procedures and a faster time to closure. In a cadaver study, the VJT was significantly more effective at removing contaminants compared to high pressure pulsatile lavage.

A 7 year old mare presented to the hospital after falling in the water jump at a horse trials. There was severe trauma to the left carpus (Figure 4), although fortunately no communication with the carpal joints. At surgery, extensive abrasive damage to the extensor carpi radialis tendon was evident, ingrained with grit. The remainder of the wound was also grossly contaminated (Figure 5). At surgery, the wound and exposed tendon were carefully debrided with the aid of the VST system. The skin flap was tacked in place to prevent contraction and penrose drains inserted (Figure 6). The wound healed remarkably well and within three weeks only a small defect at the proximal extent remained (Figure 7). There was no need for further debridement or skin grafting.

In summary, the VERSAJET Hydrosurgery System produces a clean, consistent wound bed, selectively removing only non-viable tissue. Since debridement and lavage can be completed in a single step and at arms length, it is possible to perform the procedure standing in many cases that would previously have required a general anaesthetic. It has proved an effective mechanism for shortening the healing period of equine limb wounds.



Figure 1: Versajet console and handpiece

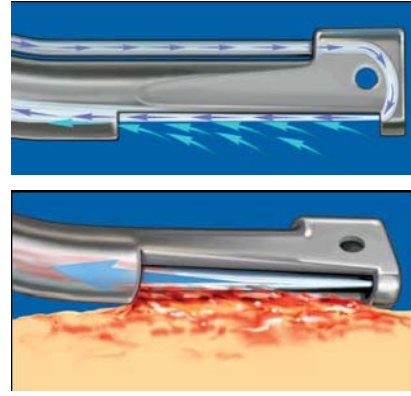


Figure 2: Venturi effect created by the handpiece

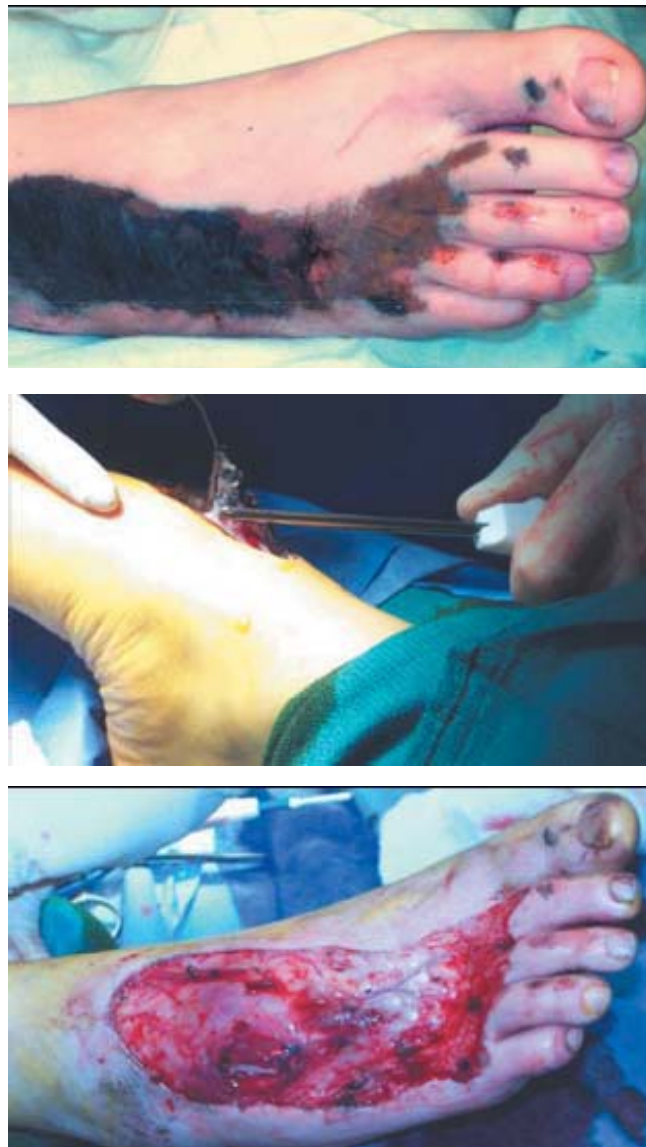


Figure 3: Versajet being used for the debridement of severe burn wounds in the foot



Figure 4: Severe trauma to left carpus following a fall at a water jump



Figure 5: At surgery, the full extent of the contamination and abrasive damage to the extensor carpus radialis tendon became evident



Figure 6: The wound and exposed tendon are carefully debrided with the Versajet system



Figure 7: Three weeks following injury, only a small defect remains.