Vacuum-assisted Closure for Hand Injuries

Richard L. Uhl, MD

With what types of hand injuries can vacuum-assisted closure (VAC) be used?

Large wounds with an insufficient bed for skin grafting are most helped with VAC therapy. The negative-pressure environment of VAC helps decrease swelling, remove exudate, promote granulation tissue, and shrink the size of the wound. If a skin graft is applied to a hand wound, VAC application can promote adherence of the graft and improve graft take.

What types of dressings are used for VAC treatment for hand injuries?

Wound VACs use 3 types of foam: black, white, and silver. The black foam is used most commonly. It promotes heavier granulation tissue and tends to stick to the wound, making dressing changes more painful. White foam is hydrophilic and does not stick to the wound as much as black foam. White foam can be used over skin grafts, muscle, and tendon. It also has a greater tensile strength and can be used in tunnels, whereas the black foam should only be used on the surface. Silver foam is like the black open-cell foam but has greater antibacterial properties because of the impregnated silver.

What is the application process for VAC use with hand injuries?

Wounds have to be debrided of necrotic tissue before VAC application. Wounds should be serially debrided and treated with wet to dry dressings until clean. The VAC can then be applied to help promote rapid granulation.

What is the treatment protocol when using VAC for hand injuries?

Wounds on the palmar surface can be treated with black sponges. Wounds on the dorsal surface, which include the extensor tendons,
are treated with a nonadherent dressing, such as Adaptic (Johnson & Johnson, New Brunswick, New Jersey) or white sponges. Sponges should not be applied directly over exposed nerves or blood vessels.

**What are some advantages of VAC treatment for hand injuries?**

Wound VAC can help promote wound healing and will help provide a bed of granulation tissue. Hand wounds can remain swollen for some time following injury, and VAC helps decrease swelling, which leads to better hand function overall.

**What are some disadvantages of VAC treatment for hand injuries?**

Vacuum-assisted closure should not be used if the wound is necrotic. Occasionally, patients have had increased bleeding with VAC application. Also, the VAC wound bed is not good for tendon gliding unless the tenosynovium is intact. In general, VAC treatment is a safe but expensive treatment option.

**How does VAC treatment differ for the hand vs other areas of the body?**

Vacuum-assisted closure requires an occlusive dressing seal to work. Although it is easy to get a good seal on flat areas of the body, it is more difficult to seal around the thumb and fingers. To do so, it is important to dry the fingers thoroughly before applying the occlusive dressing. In addition, cutting the film into smaller strips makes it easier to wrap around the fingers. Tendon gliding is more critical in the hand than in the forearm or lower extremity.

**What research is being done on VAC for hand injuries?**

Some published reports have discussed the use of wound VAC in the hand and fingers, but in far fewer cases than those published for chest and lower-extremity wounds. Because the hand usually heals well on its own, cases requiring wound VAC application are far less common than those for the rest of the upper extremity and the lower extremity.