

## UROGENITAL TRAUMA

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### **Specific Fracture Configurations Predict Sexual and Excretory Dysfunction in Men and Women 1 Year after Pelvic Fracture**

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**Purpose:** We determined the prevalence and predictors of sexual and excretory dysfunction in patients 1 year after pelvic fracture.

**Materials and Methods:** The multicenter Pennsylvania Trauma Outcomes Study enrolled 1,238 patients and contacted them 1 year after injury. Sexual limitations and excretory dysfunction (bladder/bowel incontinence) were defined based on responses from the Functional Capacity Index. Health related quality of life was determined using SF-36. The relationship between specific fracture patterns and dysfunction along with the effect of dysfunction on quality of life in patients with pelvic fracture were evaluated by multivariate analysis.

**Results:** Of 1,160 eligible patients 292 (26%) had pelvic fractures. Sexual dysfunction was reported in 21% vs 14% of those with vs without pelvic fractures and bowel or bladder incontinence was reported in 8% vs 4%. On multivariate analysis men with sacroiliac fractures were at higher risk for sexual (RR 4.0, 95% CI 2.3 to 6.8) and excretory (RR 4.3, 95% CI 1.4 to 13.5) dysfunction. In women symphyseal diastasis was associated with sexual (RR 4.8, 95% CI 2.0 to 11.2) and excretory (RR 12.5, 95% CI 1.9 to 80.2) dysfunction. Of patients with pelvic fractures men with sexual dysfunction and women with excretory dysfunction had significantly worse quality of life than those without dysfunction.

**Conclusions:** One year after trauma men with sacroiliac fractures and women with symphyseal diastasis were at increased risk for sexual and excretory dysfunction independent of overt pelvic organ injury. In patients with pelvic fracture male sexual dysfunction and female excretory dysfunction were associated with decreased quality of life. Our data highlight the need for further study of dysfunction following pelvic trauma and interventions to decrease the risk of long-term disability.

### **Editorial Comment**

Erectile dysfunction after pelvic fracture is interplay of injury to the penile arterial inflow, venous outflow or nerve innervation. Clearly injuries to the pubic rami that result in bony distraction, may also displace and injury the crus of the penis. Such patients may suffer from venous leak or arterial insufficiency, or both. The arterial and nervous supply to the penis is partially protected by the fascial walls of Alcock's canal, but is vulnerable to injury if the adjacent ischial bone is fractured. Erectile dysfunction (ED) after pelvic fracture has typically been associated with concomitant urethral disruption injury. Historically, with urethral injury ED rates are up to 75%. Surprisingly, Wright et al. determined that SI fractures have the highest rates of ED. Intuitively, one would assume pubic rami and open book fractures to have high rates of male ED. Clearly, quality of life as to urinary excretory control and erectile dysfunction after pelvic fractures are issues that the urologist should be familiar with. For it is the urologic consequences of pelvic fracture that are often prolonged, morbid and difficult to manage, long after the orthopedic injuries have healed.

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## **Experience with Wound VAC and Delayed Primary Closure of Contaminated Soft Tissue Injuries in Iraq**

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**Background:** Wartime missile injuries are frequently high-energy wounds that devitalize and contaminate tissue, with high risk for infection and wound complications. Debridement, irrigation, and closure by secondary intention are fundamental principles for the management of these injuries. However, closure by secondary intention was impractical in Iraqi patients. Therefore, wounds were closed definitively before discharge in all Iraqi patients treated for such injuries at our hospital. A novel wound management protocol was developed to facilitate this practice, and patient outcomes were tracked. This article describes that protocol and discusses the outcomes in a series of 88 wounds managed with it.

**Methods:** High-energy injuries were treated with rapid aggressive debridement and pulsatile lavage, then covered with negative pressure (vacuum-assisted closure [VAC]) dressings. Patients underwent serial operative irrigation and debridement until wounds appeared clean to gross inspection, at which time they were closed primarily. Patient treatment and outcome data were recorded in a prospectively updated database.

**Results:** Treatment and outcomes data from September 2004 through May 2005 were analyzed retrospectively. There were 88 high-energy soft tissue wounds identified in 77 patients. Surprisingly, for this cohort of patients the wound infection rate was 0% and the overall wound complication rate was 0%.

**Conclusion:** This series of 88 cases is the first report of the use of a negative pressure dressing (wound VAC) as part of the definitive management of high-energy soft tissue wounds in a deployed wartime environment. Our experience with these patients suggests that conventional wound management doctrine may be improved with the wound VAC, resulting in earlier more reliable primary closure of wartime injuries.

### **Editorial Comment**

The vacuum assisted closure system is an effective, simple, and under-utilized method to help repair and close wounds. In the Iraq War, many of the injuries have devastating soft tissue defects that are ideal for negative pressure wound therapy. Numerous urologic injuries have also been seen during the Iraq conflict. Such complex urologic wounds on the penis, perineum, and scrotum are also ideal for such therapy after initial debridement. The first report of negative pressure wound therapy (NPWT) was by Fleischmann et al., *Unfallchirg.* 1993; 96: 488-92. It has been FDA approved since 1995. To perform NPWT, place a sterile foam dressing into wound defect, followed by a non-collapsible fenestrated tubing exits foam parallel to skin, connected to vacuum pump. The open wound is then converted into controlled closed wound (adhesive transparent film dressing placed on top of foam). Machine settings are typically 125 mmHg of negative pressure continuously or cyclically (5 min on, 2 min off). Dressing changes are made every 48 hours or 3 x/ week.

NPWT helps wounds to close and heal by the following mechanisms: removal of excessive interstitial edema, decompresses small vessels and restores local blood flow; removes chronic wound fluids rich in matrix metalloproteases (inhibit wound healing); mechanical deformation of cells, with foam collapse, traction forces perturb the cytoskeleton and stimulate fibroblast, endothelial cell and vascular smooth muscle cell proliferation. Contraindications to NPWT are: malignancy in the wound, tissue necrosis (large amounts) with scar (debride before starting VAC), untreated osteomyelitis, insufficient vascularity to sustain any wound healing, untreated malnutrition.

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