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VERSAJET◇
Hydrosurgery System

Retrospective evaluation of the VERSAJET◇ hydrosurgery system as a debridement instrument

Wound Management www.smith-nephew.com
Smith & Nephew, Inc.
970 Lake Carillon Drive
Ste 110
St. Petersburg, FL 33716
USA

Customer Care Center
1 800-876-1261
T 727-392-1261
F 727-392-6914

RA1000

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Retrospective evaluation of the VERSAJET◇ hydrosurgery system as a debridement instrument

Mark Granick MD
Professor and Chief of Plastic Surgery,
University of Medicine and
Dentistry of New Jersey

Professor John Posnett
Director of Health Economics & Outcomes Research,
Smith & Nephew
Wound Management, Hull, UK

Study objectives

The VERSAJET hydrosurgery system is cleared for market by the US Food and Drug administration (FDA) for wound debridement, soft tissue debridement and cleansing of the surgical site; and CE marked for removing tissue and material from wounds in various surgical procedures, including wound debridement. It uses a fluid jet under high pressure to hold, cut and remove necrotic tissue and contaminants.

Because of its design VERSAJET is expected to offer greater precision and tissue selectivity than conventional surgical debridement techniques, quicker debridement and a reduction in the number of operating room (OR)-procedures required to close a wound. The primary aim of this study was to evaluate the safety and efficacy of VERSAJET on the basis of clinical experience at the University of Medicine and Dentistry of New Jersey (UMDNJ) over a 12-month period in 2003. A secondary goal was to evaluate the potential cost savings associated with VERSAJET.

Methods

The study included all patients who had an excisional treated at UMDNJ during 2003 and for whom VERSAJET was explicitly mentioned in the patient's operative notes.

Information was extracted from the hospital medical record and physician chart for each patient. Information was collected on patient characteristics; wound characteristics and details of the debridement procedure.

As a control, a further sample of patients was selected whose wound was debrided by conventional surgical methods by the same surgeon in 2002. Wound types were matched as closely as possible with the wounds in the VERSAJET sample. Information was extracted from the medical record for each of these patients.

Sample characteristics

Complete records were identified for 40 patients whose wounds were debrided with VERSAJET at UMDNJ during 2003. A total of 45 wounds were debrided in these patients. A total of 22 patients were selected to act as controls.

VERSAJET

The mean age of patients was 46 years (median = 46). The 40 patients in the sample had a total of 45 wounds. Wounds were evenly distributed between acute (51%) and chronic (49%). The most common wound types were surgical wound complication, decubitus ulcer and trauma wounds. VERSAJET was used to debride wounds with necrosis, fibrinous debris and granulation tissue.

All of the sample wounds were debrided at least once with VERSAJET. No other method of debridement was used.

Controls

The mean age was 53 years (median = 55 years). The 22 patients in the control group had 22 wounds: 64% chronic and 36% acute. The most common wound types were decubitus ulcer (43%) and other chronic wounds (50%).

Results

The number of debridement procedures per wound was lower in the VERSAJET group. This difference is highly statistically significant (p=0.002).

Debridement procedures per wound

	VERSAJET◇	Conventional
Mean	1.18	1.91
Variance	0.29	0.9
Observations	45	22
P(two-tail t-test)	0.002	

Debridement time per procedure

This was similar in the two groups. The pooled mean was 64.7 minutes per debridement procedure.

Cost per debridement procedure

Detailed information was obtained on charges and costs for 55 individual debridement procedures carried out at UMDNJ on patients in the study sample. Applying the overall cost/charge ratio relevant to UMDNJ in 2003 (0.3385), the average cost per debridement was $3,393.

Cost savings with VERSAJET

In this study the use of VERSAJET was associated with a reduction in the number of debridement procedures per patient from 1.9 to 1.2 (a reduction of 0.7 procedures per patient on average).

The resource saving associated with the use of VERSAJET in this study was approximately $1,941 per patient. These savings were a result of the reduction in the number of debridement procedures needed per patient. (see Table 1).

Case study

A 73 year-old man with occulusive vascular disease with extensive necrosis of his left leg. The patient was revascularised and the eschar removed by sharp debridement. The VERSAJET was then used to serially remove necrotic subcutaneous tissue while preserving periosteum and paratenon. Negative pressure wound therapy was used between debridements. The patient was skin grafted and remained healed during the subsequent 10 months of follow-up.

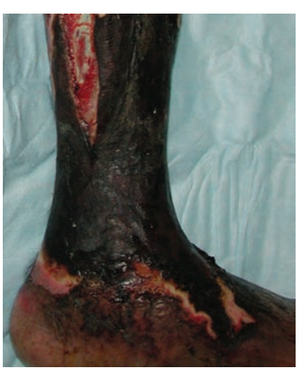

Figure 1

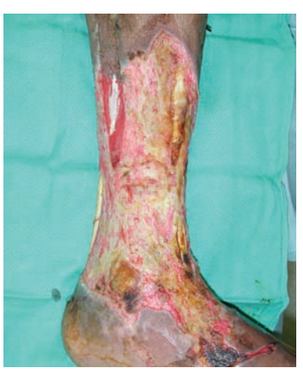

Figure 2

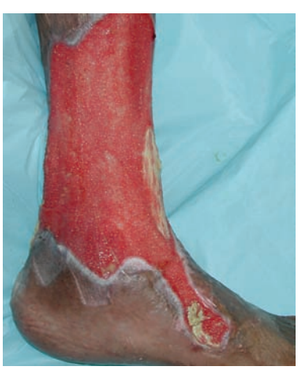

Figure 3

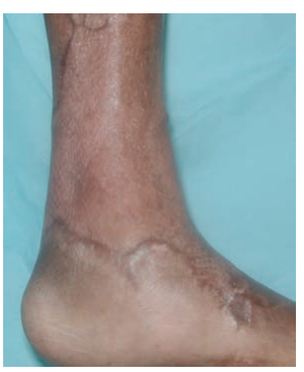

Figure 4

Table 1: Average Debridement Cost Per Patient Based on UMDNJ Costs, 2002/03

	Average debridement cost (per patient)	Average debridement cost (per patient)	Cost saving with VERSAJET (per patient)
	Conventional	**VERSAJET**	
Debridement per patient	1.9	1.2	
VERSAJET Cost			
Handpiece	$0	$474	
Additional saline	$0	$25	
(sub-total)	$0	$499	-$499
Resource Costs			
Recovery room	$986	$623	
Operating room	$2,685	$1,696	
Anesthesia	$730	$461	
Diagnostic tests	$238	$150	
Pathology	$34	$22	
Other resource costs	$253	$160	
(sub-total)	$4,925	$3,110	$1,814
Materials Costs			
Anesthesia & pharmacy supplies	$705	$445	
Medical & surgical supplies	$661	$418	
VAC	$55	$35	
Pulse lavage	$103	$0	
(sub-total)	$1,524	$898	$626
Total	**$6,449**	**$4,507**	**$1,941**

Reference
Granick MS, Posnett JW, Jacoby M, Noruthum S, Ganchi P, Datiashvili R (2005). Efficacy and cost-effectiveness of the high powered parallel water jet for wound debridement. (Under submission)

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