A Prospective Randomized Study Evaluating the Time Efficiency of the VERSAJET® Hydrosurgery System and Traditional Wound Debridement

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Introduction

Adequate and efficient debridement is paramount in eliminating wound debris which acts as a bacterial culture medium, predisposes patients to the potential development of infectious processes and inhibits re-epithelialization. The removal of decaying and necrotic dermal-epidermal elements halts the need for an extensive auxiliary immune reaction. Therefore, through metabolic strain reduction, the immune effort within surrounding healthy tissues can shift towards healing. The formation of granular bleeding wound surfaces chemotactically increases local and systemic factors, which synergistically stimulate the repair process. The process of wound healing is a complex orchestration of cell mediated growth factors and chemotactic signals, ultimately resulting in increased mitotic figures and re-epithelialization (1).

Methods and Materials

The complexity of surgical wound debridement is determined by the severity of necrosis, fibrosis, overall vascular compromise, wound surface area (SA) and infection. A prospective randomized study intended to evaluate the efficiency and speed of two wound debridement methods was carried out at the Mount Sinai Hospital of Queens (Astoria, N.Y.). Method one (M1) consisted of a traditional debridement technique while method two (M2) employed the VERSAJET Hydrosurgery System. Wounds ranged in surface area from 65 cm² to 3.4 m². The location of the lesions were equally divided among the breast, midfoot and forehead. Common pathologies related to the formation of these wounds included neuropathic ulceration associated with diabetes mellitus, stasis ulcers secondary to peripheral vascular disease and the development of infectious processes. Wounds were divided into 3 groups depending on size: small, medium and large (2).

Results

Twenty-seven patients were enrolled into the wound debridement study. The M1 group was composed of 11 patients who underwent traditional debridement via sharp and blunt surgical technique. The M2 group consisted of a total of 16 patients who underwent debridement via the VERSAJET Hydrosurgery System. Wounds were divided into small, medium and large subdivisions for both M1 and M2. The overall average rate of debridement was calculated at 0.18cm²/sec for M1 and 1.67cm²/sec for M2.

Discussion

The VERSAJET Hydrosurgery System is efficient and precisely targets necrotic areas while sparing viable tissue margins. It has multiple applications in traumatically induced injuries, soft tissue infections and wound debridements. Water jet dissection has been used for more than two decades in liver and kidney surgery and more recently, has been used in laparoscopic surgery (2). Surgical debridement through the use of this system provides the operator and patient the benefits of clean, viable and healthy wounds which reduces the need for repeat procedures (3). This benefit is of considerable importance when recognizing the cost of therapy for a foot ulcer has been estimated at $28,000 in the 2 years following diagnosis (4).

In conclusion, the VERSAJET Hydrosurgery System will decrease the time required to adequately and efficiently debride wounds as compared to traditional methods.

Bibliography

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