Wound Infection Mitigation

Antibiotic-Loaded Biopolymer Sponge for Prevention of Polymicrobial Wound Infection

Researchers from the University of Memphis have been working to combat infections in traumatic injuries using a scaled-up chitosan sponge delivery system to provide reliable, low-cost infection prevention that can be used in conjunction with surgical debridement and irrigation and systemic antibiotic regimens. In a murine model, the team demonstrated effectiveness of dual antibiotic (amikacin and vancomycin) loaded sponges against polymicrobial bacterial contamination (Staphylococcus aureus and Pseudomonas aeruginosa) and biofilm formation. Bionova Medical Inc., commercial licensing partner of the chitosan sponge technology and sub-award recipient, has made significant progress in the past year toward expansion and development of the technology into the marketplace. The chitosan technology was commercialized and officially launched as the Sentrex BioSponge in August 2014. Prior to launch, Bionova conducted a pilot study in goats to assess the degradation characteristics of the device in a clean injury, with both bony involvement and soft tissue injuries. Through this pilot study, it was determined that the device was biocompatible, with test subjects showing no adverse events related to sponge implantation. Successful launch of the Sentrex BioSponge began with two large trauma centers—Regional One Health in Memphis, Tennessee, and University of Arkansas for Medical Sciences in Little Rock, Arkansas. The Sentrex BioSponge itself has been used to treat a variety of wounds, from surgical sites to open fractures, and even chronic, non-healing ulcers, and to date has been used over 800 times clinically in over 30 centers. The majority of use has been in orthopedic trauma, although many uses have come on chronic non-healing wounds at surgical wound care centers. The Sentrex BioSponge was added to the Federal Supply Schedule on 1 April 2015. Transactions to VA and government hospitals are facilitated by the company Tryco. This study has resulted in a novel adjunctive therapy to prevent and treat infections associated with traumatic orthopedic wounds, improving treatment outcomes for compound extremity fractures for both military and civilian populations. The cost-effective and time-saving treatment strategy can reduce the impact of these injuries on military healthcare resources.