Prospective, Randomized Trial of the Efficacy of a Oxygen-Diffusing Dressing for Donor-Site Wound Healing

K. F. Lairet, MD, FACS, L. C. Cancio, MD, FACS,
M. L. Leas, RN, C. Galin, RN, E. M. Renz, MD,
FACS, D. G. Baer, PhD
U.S. Army Institute of Surgical Research, Fort Sam Houston, TX

Introduction: Donor-site wound healing is a major ratelimiting step in how quickly burn patients recover from their injuries. We conducted a prospective, randomized, open-label, controlled clinical trial of a novel oxygen-diffusing dressing (Oxyband), compared to our standard Xeroform donor-site dressing.

Methods: The IRB approved this study. Oxyband is a directionally permeable, gas-emitting reservoir which delivers oxygen to the wound surface. Burn patients with less than 30% TBSA and without major comorbidities, who were to undergo harvesting of 2 symetrically placed donor sites, were enrolled. Patients served as their own controls. They underwent harvesting of split-thickness skin grafts at 10/1000". One donor wound was dressed with OxyBand and the other with Xeroform gauze. The primary endpoint was time to confluent epithelialization. Wounds were inspected and photographed on postoperative days 4 and 8, and then every 2 days until they were healed, as determined by a staff burn surgeon. Pain scores at each site were also collected at these visits (rated by patients on a scale from 0-10). After both wounds were healed, patients were seen at a 30-45 day visit to photograph the wounds and assess cosmesis in blinded fashion.

Results: 20 patients were enrolled, of which 17 completed the study. There were 3 females and 17 males. Mean age was 35 years. Mean burn size was 9.2% TBSA (range 2-24%). Mean time to wound healing for Oxyband was 9.3 +/- 1.7 days, compared with Xeroform at 12.4 +/- 2.7 days ($p<0.001$). Pain scores were significantly lower ($p<0.05$) at the OxyBand site compared to the Xeroform site at postoperative days 4, 8, 10, and 12. No difference in cosmesis was noted at long-term follow up.

Conclusions: This study revealed a decrease in the time to healing of, on average, 3 days with the oxygen-diffusing dressing. In addition, patient-reported pain at donor sites was decreased with the study dressing.

Applicability of Research to Practice: An FDA-approved dressing was shown to decrease time to healing of donor wounds in a relatively healthy burn patient population. Further studies are needed to assess efficacy in patients with larger burns and/or more comorbidities.

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