EVALUATION OF MICROMEND® WOUND CLOSURE DEVICE IN REPAIRING SKIN LACERATIONS

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Study Objective: Sutures, staples, tissue adhesives, and bandages are used for simple laceration closure, but they have limitations. Sutures and staples are painful and require clinic visits to remove. Tissue adhesives and bandages can cause inflammation and carry a risk of wound dehiscence. Therefore, there is an unmet need for better skin closure products. microMend® is a novel wound closure device that consists of microstaple arrays attached to an adhesive backing that is the size of a butterfly closure. This study aims to evaluate the feasibility of simple laceration closure using microMend in the emergency department (ED).

Method: This was an open label, single-arm study conducted at two EDs within a large urban academic medical center. Eligible participants were ≥18 years old. After informed consent, one device was applied for every 1-1.5 cm of wound length. Closure was performed by physicians and advanced practice providers. Device removal occurred on Days 5-7 for facial lacerations and Days 7-10 for other locations. A provider satisfaction survey was performed after device application at baseline ED visit. Follow-up assessments, participant satisfaction surveys and photographs of the wound were performed at Days 0, 10, 30 and 90. Photographs were rated by two independent plastic surgeons using a 100-mm visual analog scale (VAS) (0 = worst possible scar, 100 = best possible scar) and a wound evaluation scale (WES) assessing 6 clinical variables (the maximum score is 6). Descriptive statistics are reported.

Results: Thirty one patients were enrolled in the study: 48% were female, the median age was 42 (IQR 30.5-58), and the median BMI was 27 (IQR 22-29.4); 68% non-Hispanic white, 19% Hispanic white, 10% non-Hispanic African American, 3% other. The median wound length was 2 cm (IQR 1.6-2.5). Ninety percent of the wounds were closed with 1 or 2 devices. The median pain score with application of the devices was 1 (IQR 0 – 10) on a 0-100 mm VAS. Mean time for device application was 89 ± 82 seconds. Local anesthesia was used in 29% of participants (usually for placement of deep sutures) and 97% of providers rated the ease of device application as good or excellent. In addition, 30 of 31 patients (97%) rated the overall device assessment as good or excellent on the Day 10 and Day 30 follow-ups, and 100% of patients rated the overall device assessment as good or excellent on the Day 90 follow up. Two independent plastic surgeons evaluated wound appearance. At Day 90, the mean VAS and WES scores were 83 ± 15 mm and 5 ± 1, respectively. The agreement between plastic surgeons for these measurements was 82%; 61% of participants had an average WES of 5 or more. Deeper wounds tended to have lower scores. There were no serious adverse events.

Conclusions: Overall, microMend is an acceptable alternative for skin closure in the ED. Nearly all participants and providers rated high levels of satisfaction during application and removal. A majority of participants also had satisfactory cosmetic results at Day 90. Advantages of microMend include ease of use, short application time, low patient-reported pain upon application, and potentially decreased need for local anesthesia. Variability in cosmesis may be dependent on patient, wound, and provider factors. Future studies could evaluate the ability for patients to remove the device at home. Randomized controlled trials are needed to compare microMend to other wound closure methods.

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