has been shown to allow earlier re-exploration and higher salvage rates than clinical assessment alone. We designed a novel text messaging system to improve communication using tissue oximetry monitoring.

**MATERIALS AND METHODS**: A retrospective review was performed of a prospectively collected database of all microsurgical breast reconstructions from 2008 to 2015. A novel text messaging system was introduced in 2013 and programmed to send text messages alert when the tissue oximetry readings suggested potential flap compromise based on established thresholds. Patient demographics and complications, including rate of re-exploration and flap loss (partial and total) were assessed.

**RESULTS**: There were 900 autologous microsurgical breast free flaps during the study period: 614 were monitored with standard clinical monitoring and tissue oximetry compared with 286 flaps with the additional text messaging system. There were 27 unplanned returns to the operating room in the tissue oximetry group and 5 in the text messaging group with 1 complete flap loss in each group. Re-exploration occurred sooner as a result of these text message alerts (17.5 vs. 26.6 hours postoperatively), however, did not achieve statistical significance.

**CONCLUSIONS**: We were able to demonstrate the use of a novel text messaging system for tissue oximetry. This alert system shows promise in identifying impending flap loss with rapid notification of the surgical team. Improved communication and identification of failing free flaps will allow for an even further improvement of salvage rates.

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**ATAC-seq Reveals Heterogeneity of Fibroblasts During Transition from Scarless Fetal to Scar-Forming Adult Wound Repair**

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**INTRODUCTION**: Cutaneous wounds in early gestation heal without a scar in a process resembling regeneration.1 Although myriad studies have been performed to understand this phenomenon, the exact mechanism for fetal scarless repair is unknown. We previously characterized a fibroblast lineage in the dorsal skin of adult mice defined by embryonic expression of Engrailed-1 (En1) thought to be responsible for scar formation.2 Here, we investigate the role of this lineage during fetal wound healing.

**MATERIALS AND METHODS**: En1-derived fibroblasts were traced by crossing En1Cre and ROSA26TmG mice. A murine model of fetal scarless wound healing allowed for investigation of En1-derived fibroblast behavior before and after the scarless to scarring transition. En1-derived fibroblasts were characterized using flow cytometry. ATAC-seq (Assay for Transposase-Accessible Chromatin with high throughput sequencing) was also performed in isolated pre- and post-gestational fibroblasts at a series of time points.

**RESULTS**: Dorsal wounds created at embryonic day (E)16.5 healed scarlessly with minimal connective tissue deposition. However, wounds created at E18.5 healed with substantial scar deposited primarily by En1-lineage-derived fibroblasts. The abundance of En1-lineage-derived fibroblasts and the expression of CD26, a previously identified marker of the En1 lineage, steadily increased from E12.5 through postnatal day 1. Differential transcriptional activity shown by ATAC-seq further demonstrates the heterogeneous nature of fibroblasts within the dorsal dermis.

**CONCLUSION**: The En1 lineage of fibroblasts plays a critical role in the transition from scarless wound healing during fetal development. These results hold promise for the development of therapeutic approaches to fibrotic disease and adult wound healing.

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Evaluation of the Potential for Improved Wound Healing Through the Usage of a Topical Resveratrol Preparation

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INTRODUCTION: Full thickness wounds are a burden to the medical population. Many conservative wound treatment regimens exist. Recently, a grape seed extract known as resveratrol has gained popularity in the media. Previous studies suggest that resveratrol may impact wounds by up regulation of VEGF.1,2 The aim of this study is to evaluate if a topical resveratrol preparation can speed wound healing and reduce scarring.

MATERIALS AND METHODS: In this prospective controlled study, three pigs were anesthetized before each receiving twenty full thickness excisional wounds on their back skin. Wounds were divided into five groups. Each group received treatment with one of the following: low (2 mg/ml), medium (10 mg/ml), or high (50 mg/ml) concentration of topical resveratrol, silver sulfadiazene (SSD), or a control carboxymethyl cellulose gel. Full thickness punch biopsies and digital images of each wound were obtained at 3 days, 7 days, 2 weeks, 3 weeks, 4 weeks, and 6 weeks post wound creation. A blinded evaluator performed histological evaluation.3 Digital planimetry software was used to analyze the area of each wound at each time interval.

RESULTS: A total of 180 biopsies were analyzed. The average histological score for the treatment group (14.68) was lower than that of the control group (16.12) and the SSD group (18.14). However, this trend was not statistically significant (p=0.09). The low (15.82), medium (13.68), and high (14.58) resveratrol concentrations received histological scores less than the control (16.12) or SSD (18.14) groups. Again, this trend did not reach statistical significance (p=0.189). A total of 420 digital images were analyzed for wound surface area, and percent change of that area over time. The treatment group experienced a statistically significantly greater reduction in area (88.4%) compared to the control (86.9%) or SSD (77.2%) groups at the last photographed time period (p=0.000).

CONCLUSION: Topical resveratrol use in full thickness wounds can lead to greater reduction of wound size. This is especially true for low and medium concentrations of resveratrol, but is not the case for a high concentration of resveratrol in our series. In addition, topical resveratrol may demonstrate a benefit on the histological level with regard to scarring of wounds. However, additional studies need to be performed to determine if this trend amounts to significance.

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