THE ROLE OF ENDOGENOUSLY EXPRESSED IL-10 IN WOUND CLOSURE AND TISSUE REPAIR

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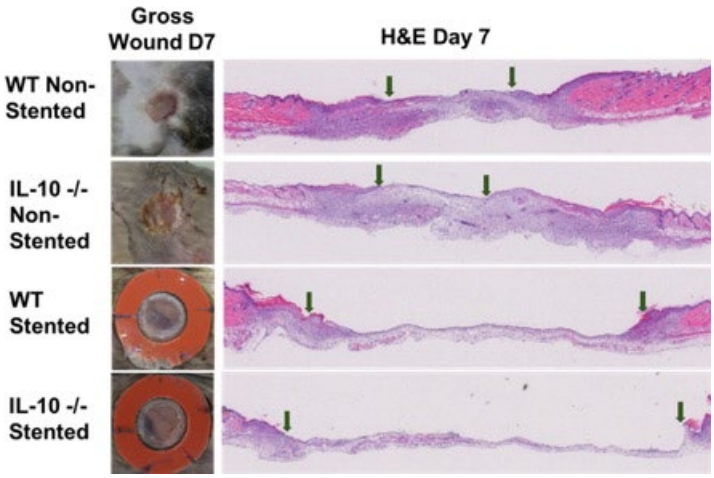
Background: We have shown a significant role for IL-10 overexpression in regulating inflammation and extracellular matrix(ECM) production. However, the role of endogenous IL-10 in wound closure is unclear, as previous studies in murine wounds that didn't control for contraction and wound environment showed increased rate of closure in IL-10-/- mice. The objective of this study is to determine the role of IL-10 on wound closure in a contraction and moisture controlled environment.

Materials/Methods: Full thickness 6mm bilateral wounds were made in C57B6/J WT and IL-10-/- mice, controlled for contraction using a silicone stent. A Tegaderm dressing provided a moist wound environment. Wounds were photographed at 3, 5 and 7d, harvested at 7d and 30d post-wounding, then examined for epithelial gap, granulation tissue, scar area(H&E), myofibroblasts(a-SMA), leukocyte(CD45), and macrophage content(F4/80). Data is mean, n=8-10 wounds/group/time point; p-value by ANOVA.

Results: Unstented IL10-/- wounds showed no significant difference in epithelial gap at D7, but an increase in granulation tissue (IL-10-/- 1.4 vs WT 0.8mm2,$p<0.01$) versus WT. Unstented IL-10-/- wounds exhibited elevated percentages of CD45+(IL-10-/- 28.9% vs WT 6.0, $p<.01$) and F4/80+(IL-10-/- 53.7% vs WT 28.3,$p<.01$) cells/high power field(HPF). Upon stenting, no difference in epithelial gap and granulation tissue was seen. The increase in % of F4/80+ cells/HPF(IL-10-/- 21.3% vs WT 22.4, $p<.05$) was maintained in stented wounds. There was an increase in the % of CD45+ cells/HPF(IL-10-/-22.4% vs WT 13.6%, p=ns) in the stented group also. D30 wounds in IL-10-/- mice developed significantly more scar area than WT in stented(IL-10-/- 0.24 vs WT 0.17mm2, $p<.05$) and unstented(IL-10-/- 0.18 vs WT 0.13mm2, $p<.05$) groups.

Conclusions: IL-10 expression doesn't delay normal healing of skin wounds when controlled for contraction and moist environment. However, loss of IL-10 leads to increased inflammation and fibrosis. This data signifies a previously unrecognized role for endogenously expressed IL-10 in the tissue repair response.

Images / Graph / Table


Gross Wound D7
H&E Day 7
WT Non-Stented
IL-10 -/- Non-Stented
WT Stented
IL-10 -/- Stented