A comparison of keratinocyte cell sprays with and without fibrin glue.

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Abstract:

Fibrin glue is an excellent template for cellular migration and has been shown to be an effective delivery system for cultured autologous keratinocytes. We have investigated whether fibrin glue has any benefit on the percentage of epithelial cover when cultured autologous keratinocytes are sprayed onto a freshly debrided wound bed. Three pigs were used for this study. This provided a total of 18 full thickness, vertically orientated wounds, each 4cm in diameter and isolated in PTFE chambers to prevent re-epithelialisation from the wound margins. Eight wounds were sprayed with cultured autologous keratinocytes suspended in 2ml culture medium and eight wounds were sprayed with cultured autologous keratinocytes suspended in 1ml of the fibrin/aprotinin component of Tisseel fibrin glue (Baxter) mixed with 1ml of culture medium. In the latter group the thrombin component of the fibrin glue kit was applied to the wound bed immediately prior to grafting. The remaining two wounds were used as controls and sprayed with either culture medium or fibrin glue without cells. Epithelial cover was calculated in whole-wound biopsies at 3 weeks using image analysis, histology and immunohistochemistry. The cell suspension in fibrin glue appeared to spread more evenly over the wound surface, with no pooling in the inferior aspect of the wound. However, mean epithelial area at 3 weeks in the fibrin group was 1.6cm(2) per wound compared with 1.8cm(2) for the non-fibrin group, as measured by image analysis of digital photographs. There was no statistically significant difference between the two groups (P=0.802). This surprising result was confirmed by histological analysis of the wound biopsies, with a good correlation between histological and image analysis data (R=0.967). There was no observable difference in the quality of the epithelium on histological and immunohistological analysis of either group.