Skin graft fixation by slow clotting fibrin sealant applied as a thin layer.

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Publication Date: 2006

Abstract:

Human fibrin sealant (FS) has been proven effective for skin grafting after severe burn, however no systematic evaluation of application conditions has been performed so far. In order to find the optimal FS amount for fixation of skin grafts to deep defects, we created four full thickness wounds (8 cmx4 cm) on the dorsum of six male pigs. Wounds were covered with unmeshed split thickness skin grafts and fixed either with a thin layer (0.05 ml/cm2) or a thick layer (0.15 ml/cm2) of fibrin sealant (FS) without additional sutures. Sutures served as controls. FS was used as a slow clotting spray (4-5 IUthrombin/ml). Outcome measurements revealed that hematoma formation (day of surgery) was more extensive and occurred more frequently in the suture group as compared to FS 0.05 ml/cm2 ($p<0.05$). Areas of graft dislocation tended to be larger in the suture group versus the FS 0.05 ml/cm2. The FS 0.05 ml/cm2 graft take on day 5 appeared to be enhanced in comparison to the suture group. Excellent outcome was notable on the final observation day (day 21) in the FS 0.05 ml/cm2 group with a take of 99.7% (IQR 96.1-100%). Corresponding values in the FS 0.15 ml/cm2 group were 96.9% (IQR 92.2-99%) and 95.9% (IQR 93.2-98%) in the suture group. The results indicate, that the usage of a sprayed thin FS layer (0.05 ml/cm2) in a slow clotting rate (4-5 IUthrombin/ml) is an appropriate fixation method in split thickness skin transplantation.