USZ Universitäts Spital Zürich

Topical Application of SVF / PRF in Thermal Injuries – A Case Series

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INTRODUCTION

The stromal vascular fraction (SVF) can be harvested from patients' fat depots, contains adipose-derived stromal cells and promotes epithelialization, angiogenesis and immunomodulation. Platelet-rich fibrin (PRF) obtained through centrifugation of autologous patient blood, consists of platelets, cytokines and growth factors in a fibrin matrix. The SVF and PRF nurtures to hope for less invasive solution treating acute burn wounds.

METHODS

Between 2018 - 2020 patients with acute thermal injuries presenting deep partial-thickness burns (DPTB) or mixed-partial burns (MPB) were treated with a combined topical application of SVF and PRF. Retrospectively the course of wound healing and the need of further surgical interventions in the presence of residual defects were assessed.

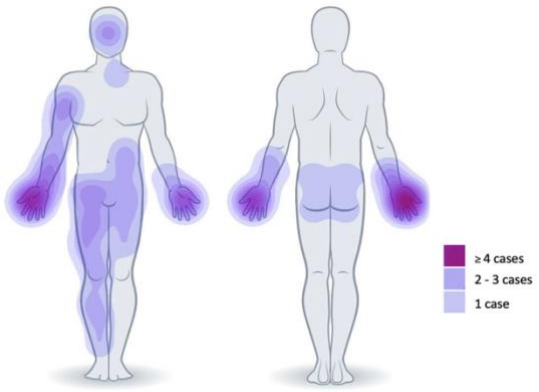

Figure 1: Heatmap illustrating the anatomical regions treated with SVF and PRF

RESULTS

13 patients were treated and evaluated. Cause of injury involved flames and scalds. The mean TBSA was 29.6 % and the mean BSA treated with SVF / PRF was 6.3 %. The first debridement was performed enzymatically with bromelain in 9 cases and surgically in 4 cases. Residual defects requiring split-thickness skin graft (STSG) coverage occurred in 5 out of the 13 patients. The mean time until the wounds fully epithelialized was 33 days. The areas without residual defects showed a complete healing within 20 days whereas those with residual defects healed within 51 days. The mean MSS score was 7.3 at their final follow-up. Mean MSS score of the cases with residual defects was 8.4 when compared to 5.9 of the cases without residual defects.

Figure 2: Patient #5: **(A)** After the enzymatic debridement with bromelain. **(B)** 5 days after SVF and PRF application. **(C)** 21 days after SVF and PRF application. **(D)** Final result after 5 years.

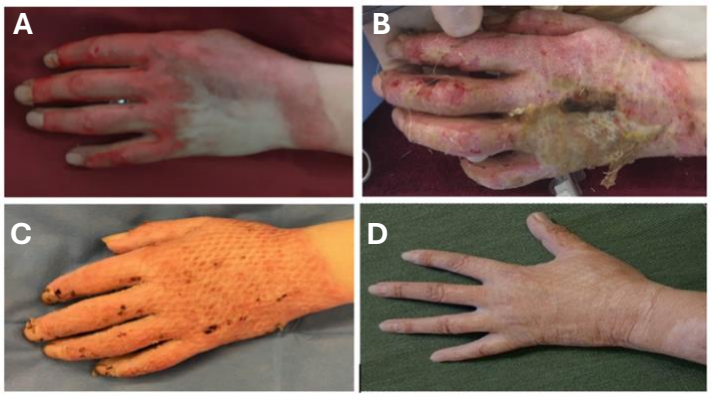

Figure 3: Patient #1: **(A)** Before the enzymatic debridement with bromelain **(B)** 14 days after SVF and PRF application. Due to residual defects STSG covering was performed **(C)** 14 days after STSG application **(D)** Final result after 5.5 years

Variable	Mean	SD
Patients with residual defects requiring further surgery [%]	45	-
BSA residual defects [%]	6.6	6
BSA residual defects / BSA treated area in patients with residual defects [%]	91	-
Time-to-heal all patients [d]	33	17.7
Time-to-heal with residual defects [d]	51	8.8
Time-to-heal without residual defects [d]	20	7.5
Time-to-heal after residual defect coverage with STSG [d]	13.4	4.6

Table 1: Specification of areas with residual defects requiring further surgery and time-to-heal

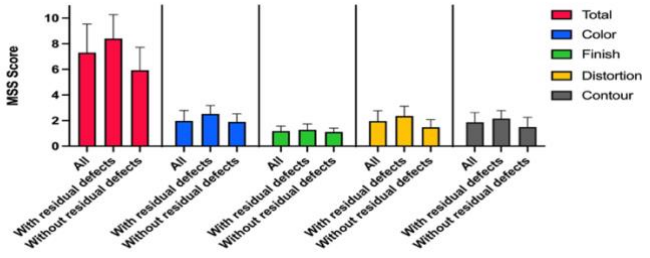

Figure 4: Mean total MSS score as well as for *color*, *finish*, *contour* and *distortion* of all patients and of the cases with and without residual defects specifically.

DISCUSSION

Taken together, the topical application of SVF and PRF in theory permits a minimal invasive therapeutic option for the coverage of acute MPB and DPTB injuries. Due to the relatively high occurrence of residual defects requiring further surgical interventions after the treatment with topical SVF and PRF, it may not yet be considered a standard therapeutic procedure. Furthermore, regulatory aspects for SVF isolation have to be respected as enzymatic digestion is restricted in many countries.