Platelet rich plasma enhancement of skin regeneration in an ex vivo human experimental model

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Abstract

An original ex vivo wounded skin culture protocol using autologous Platelet Rich Plasma (PRP) and enriched Dulbecco’s Modified Eagle’s Medium demonstrated a favourable modulation of the epithelial cells and fibroblasts proliferation, a relevant anti-inflammatory action and a favourable modulation of the re-organization of collagen and elastic fibres. The step by step regenerative effects of PRP on human skin wound repair and regeneration process was observed over a period of 10 days.

Introduction

This study reports on the development of an original, ex vivo wounded skin culture protocol using autologous Platelet Rich Plasma (PRP) and enriched Dulbecco’s Modified Eagle’s Medium (DMEM).1-5

Materials and Methods

Human skin samples obtained from specimens harvested during reduction mammoplasty procedures, were injured in their central portion - to create a standard wound - and cultured under three different conditions: i) enriched DMEM with saline solution in the central wound (control); ii) enriched DMEM with the same medium in the central wound; iii) enriched DMEM plus 2.5% autologous PRP, with the same PRP added medium in the central wound.

Morphological analysis was carried out at 0 h (T0) and on days 1, 3, 5 and 10 (T1-10).
T3-T5-T10) using Hematoxylin and Eosin; Masson’s trichrome staining; Weigert staining and Ki-67 staining to identify the skin histological features in the different experimental conditions (Figure 1).6

**Results**

The combination of DMEM and PRP allowed a favorable modulation of the epithelial cells and fibroblasts proliferation, and a relevant anti-inflammatory action. PRP also demonstrated an inhibitory effect on both the collagen and elastic fibers' destructuration and a favourable modulation of the re-organization of these fibers.

**Conclusions**

The step by step histological and immune-histo-chemical regenerative effects of PRP on human skin wound repair and regeneration process was observed over a period of 10 days.

**References**