

Abstract Text:

Introduction

Complex wound, soft tissue reconstruction and transplantation are inherently complicated by ischemia and reperfusion. Efforts at minimizing these deleterious effects involve meticulous design and minimizing the ischemic period. Adjunctive measures have included free microvascular transfer, supercharging, caspase inhibitors and free oxygen radical scavengers.^{1,2} In this study we hoped to characterize the potential complementary effects of Hyperbaric Oxygen (HBO) Therapies and Stem Cell (ADSC) delivery in flap preconditioning.

Methods

In this animal trial, the study group (n=6) received autologous ADSC injections subcutaneously whereas; the control group (n=6) received saline injections to the area of flap design.³ Subsequently, half of the animal subjects were exposed to four consecutive HBO treatments. Following preconditioning, a pedicled flap was elevated and clinically assessed via study-blinded observer, as well as by objective assessments of HSP 70 levels and quantification of TUNEL-positive cells.⁴

Results

The presence of venous congestion was significantly greater in the flaps that did not receive HBO therapy (26.7% vs. 0%, $p=0.004$). Distal flap necrosis was more often noted in the animal subjects who received ADSCs but were not exposed to HBO (46.7% vs. 6.7%, $p=0.013$). A statistically significant rise in HSP 70 levels in the No HBO and saline group was detected ($p=0.042$), while the percentage of apoptotic cells was greater in the HBO and saline group ($p=0.003$).

Conclusions

Preliminary study findings support that HBO preconditioning of flaps improves tissue viability and survival rates.⁵ Further investigation with a larger sample size is necessary to elucidate the true effects of HBO treatment and ADSC combination on tissue flap survival.

Reference Citations:

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