Tissue engineering approach to repair abdominal wall defects using cell-seeded bovine tunica vaginalis in a rabbit model

Abstract

The aim of this study was to engineer skeletal muscle tissue for repair abdominal wall defects. Myoblast were seeded onto the scaffolds and cultivated in vitro for 5 days. Full thickness abdominal wall defects (3 9 4 cm) were created in 18 male New Zealand white rabbits and randomly divided into two equal groups. The defects of the first group were repaired with myoblast-seeded-bovine tunica vaginalis whereas the second group repaired with non-seeded-bovine tunica vaginalis and function as a control. Three animals were sacrificed at 7th, 14th, and 30th days of post-implantation from each group and the explanted specimens were subjected to macroscopic and microscopic analysis. In every case, seeded scaffolds have better deposition of newly formed collagen with neovascularisation than control group. Interestingly, multinucleated myotubes and myofibers were only detected in cell-seeded group. This study demonstrated that myoblastseeded-bovine tunica vaginalis can be used as an effective scaffold to repair severe and large abdominal wall defects with regeneration of skeletal muscle tissue.