THE IN VIVO STUDY COMPARING BIOCOMPATIBILITY AND BIODEGRADABILITY OF POLYLACTIC-CO-GLYCOLIC ACID (PLGA) COMBINED WITH AUTOLOGOUS FIBRIN VERSUS PLGA FOR INTRA ARTICULAR SCREW FIXATION IN NEW ZEALAND WHITE RABBIT MODEL—THE MICRO-CT SCAN EVALUATION

Balakrishnan T1, Zulkifly AH1*, Mohd Jan NH1, Ibrahim MZ1, Sha’ban M2, Md Nazir N2

1Department of Orthopaedics, Traumatology and Rehabilitation, Kulliyyah of Medicine, International Islamic University Malaysia, Kuantan, Pahang Darul Makmur, 25150, Malaysia.
2Department of Physical Rehabilitation Sciences, Kulliyyah of Allied Health Sciences, International Islamic University Malaysia, Kuantan, Pahang Darul Makmur, 25200, Malaysia

ABSTRACT

The great potential of biodegradable polymers in orthopaedic surgery is gradually being recognized. PLGA is one of the common polymers used. However, long term outcomes, with regards to PLGA, are still not well documented. Hence, we attempted to study the outcome of PLGA and its combination with fibrin. The objective of this study is to compare biocompatibility and biodegradability of polymer (PLGA combined with fibrin) with PLGA for intra-articular screw fixation through micro-CT scan evaluation. We used fabricated PLGA(65:35) scaffolds in combination with autologous fibrin for an in vivo prospective research. A total of 9 New Zealand White Rabbits (NZWR) were operated and the scaffolds were implanted at both medial and lateral femoral condyles of the right knee and those with fibrin at the left knee. Post implantation, evaluation was done at 6, 12 and 24 weeks (3 NZWR in each group). For microradiological assessment, micro CT (Skyscan 1176) was used. The combination of PLGA and fibrin have better biocompatibility, showed faster biodegradation and more quantitative integration of osseous tissues. Biodegradable polymer PLGA with incorporation of fibrin results in superior outcome compared to usage of other current biodegradable polymers.