Restoration of longitudinal growth by bioengineered cartilage pellet in physeal injury is not affected by low intensity pulsed ultrasound.

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Abstract: Physeal fracture is a common pediatric fracture that would result in premature physeal closure in long bones, and there is currently no gold standard for its management. In this study, we investigated the application of a Bioengineered Cartilage Pellet (BCP) in repairing a rabbit physeal fracture model, and the possible effects of Low Intensity Pulsed Ultrasound (LIPUS) treatment. Rabbits with physeal fracture created were assigned to the NC group (no BCP, no LIPUS), GC group (BCP, no LIPUS), and GT group (BCP and LIPUS). Femoral lengths and cartilage area were assessed at 4, 8, and 16 weeks post-defect. After transplantation, the BCP showed continuous growth in the host and demonstrated resemblance to a natural growth plate. The GC group showed 34.1, 32.1, and 41.1% advantage in lengthening over the NC group and the GT group showed 51.1, 41.6, and 26.9% improved lengthening than the NC group, at 4 ($p = 0.203$), 8 ($p = 0.543$) and 16 weeks ($p = 0.049$), respectively. Cartilage area was shown to be significantly higher in GC and GT group compared to NC group (p

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