

Study on the Effect of Transphyseal Bioabsorbable Screws on Growth Retardation in Rabbit Femur

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A self-reinforced bioabsorbable poly-L-lactide/polyglycolide (SR-PLGA) 80/20 screw 2.0 mm in diameter was implanted in a transphyseal location across the distal growth plate of the right femur in 24 immature rabbits. Radiological evaluation revealed a mean shortening of 3.1 mm at 3 weeks ($p=0.050$), 11.1 mm at 6 weeks ($p=0.001$), 9.3 mm at 24 weeks ($p=0.011$), 9.0 mm at 48 weeks ($p=0.009$) and 12.6 mm at 72 weeks ($p=0.002$) compared with the intact contralateral femur. Growth retardation continued for 6 weeks postoperatively (3 versus 6 weeks, $p=0.003$), after which the bones grew normally up to 72 weeks ($p=0.6$). The duration of temporary growth retardation correlated with that of strength retention of the SR-PLGA 80/20 copolymer. These findings suggest that SR-PLGA 80/20 screws can be applied in transphyseal bone fixation. The use of bioabsorbable screws for temporary epiphyseodesis seems attractive but requires further study.

Keywords

Femur, growth, rabbit, SR-PLGA

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