

Intra-articular injection of collagenase induced experimental osteoarthritis of the lumbar facet joint in rats

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摘要

Abstract

We aimed to establish an animal model to investigate primary osteoarthritis of the lumbar facet joints after collagenase injection in rats and its effects on chondrocyte apoptosis. We hypothesized that osteoarthritic-like changes would be induced by collagenase injection and that apoptosis of chondrocytes would increase. Collagenase (1, 10, or 50 U) or saline (control) was injected into the lumbar facet joints. The histology and histochemistry of cartilage, synovium, and subchondral bone were examined at 1, 3, and 6 weeks after surgery. Apoptotic cells induced by 1 U of collagenase were quantified using the terminal deoxynucleotidyl transferase-mediated dUTP nick end labelling (TUNEL) assay. Degeneration of the cartilage and changes to the synovium and subchondral bone were dependent on both the doses of collagenase and the time after surgery. There were significantly more apoptotic chondrocytes in collagenase-treated joints than in control ($P < 0.001$ at 1 and 3 weeks and $P < 0.05$ at 6 weeks). Thus, lumbar facet joints subjected to collagenase developed osteoarthritic-like changes that could be quantified and compared. This model provides a useful tool for further study on the effects of compounds that have the potential to inhibit enzyme-associated damage to cartilage