EXPERIMENTAL ARTHRITIS

RANKL from cartilage linked to subchondral bone loss

Juxta-articular bone loss of the trabecular bone of inflamed joints is an early and typical radiographic feature of rheumatoid arthritis (RA). The pathogenesis of this type of bone loss is not well understood, but it is thought to involve cytokines, such as receptor activator of nuclear factor- κ B ligand (RANKL), produced by the inflamed synovium; however, a paper by Gabriel Herrero-Beaumont and colleagues suggests that cartilage could also be an important source of these factors.

The authors showed previously that RANKL is expressed in the extracellular matrix of human osteoarthritic cartilage and can diffuse from the cartilage to the subchondral bone. These findings, and the uniform distribution of juxta-articular bone loss in RA, led the authors to ask whether cartilage also produces mediators of subchondral bone remodelling in RA.

Here, they show that New Zealand rabbits with chronic antigen-induced

arthritis (AIA) have more extensive juxta-articular bone loss than healthy control animals. In addition, expression levels of RANKL and osteoprotegerin (OPG), and the RANKL–OPG ratio, are higher in cartilage (but not in the synovium) of rabbits with AIA than in healthy controls. Levels of RANKL and the RANKL–OPG ratio inversely correlate with subchondral bone mineral density.

“This research supports the view that inflamed cartilage might behave as a proinflammatory gland or organ producing key mediators that accelerate the destruction of other joint structures in RA and osteoarthritis,” concludes Herrero-Beaumont.

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Original article Martinez-Calatrava, M. J. *et al.* RANKL synthesized by articular chondrocytes contributes to juxta-articular bone loss in chronic arthritis. *Arthritis Res. Ther.* 14, R149 (2012)