Immunohistochemical analysis of osteoblasts in zygapophyseal joints of patients with ankylosing spondylitis reveal repair mechanisms similar to osteoarthritis.

OBJECTIVE: New bone formation of the spine is a typical feature of ankylosing spondylitis (AS). It is unknown whether new bone formation is part of a physiological repair process or a unique pathological entity of the disease. METHODS: We analyzed zygapophyseal joints from patients with AS and osteoarthritis (OA) undergoing spinal surgery for rigid hyperkyphosis (AS) or radiculopathy caused by severe OA. In 17 patients with AS, 11 with OA, and 5 controls we performed immunohistochemical analysis of osteoprotegerin (OPG), nuclear factor-kappaB ligand (RANKL), and osteocalcin (OC) expression in osteoblasts and determined the trabecular thickness in AS and OA patients and controls. Osteoclasts were detected by tartrate-resistant alkaline phosphatase (TRAP) staining. RESULTS: Trabecular thickness was significantly lower in patients with AS compared to OA ($p = 0.01$). The absolute number of CD56+ osteoblasts ($p = 0.05$ in all cases). In controls, the percentages of OPG+ ($p = 0.013$) and OC+ ($p = 0.034$) but not RANKL+ ($p > 0.05$) osteoblasts were significantly lower compared to AS patients. The frequency of TRAP+ osteoclasts in AS patients was significantly lower compared to OA ($p < 0.001$), but higher compared to controls. CONCLUSION: Immunohistochemical analysis of
zygapophyseal joints suggested that osteoblast activity is similar in AS and OA, indicating that new bone formation is possibly a physiological function of repair in both diseases.