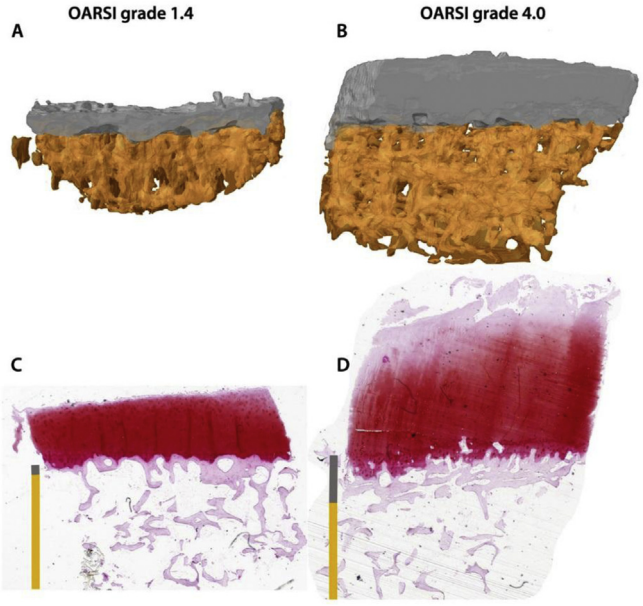

Figure 1. (A-B) Reconstructed 3D model of analyzed bone, where subchodral plate is colored as grey and trabecular bone as orange. (C-D) Safranin-O stained tissue sections from the same samples that were used for OARSI grading. Corresponding areas to uCT analysis readions indicated with respectively colored bars. OARSI grades were 1.4 for A and C and 4.0 for B and D.

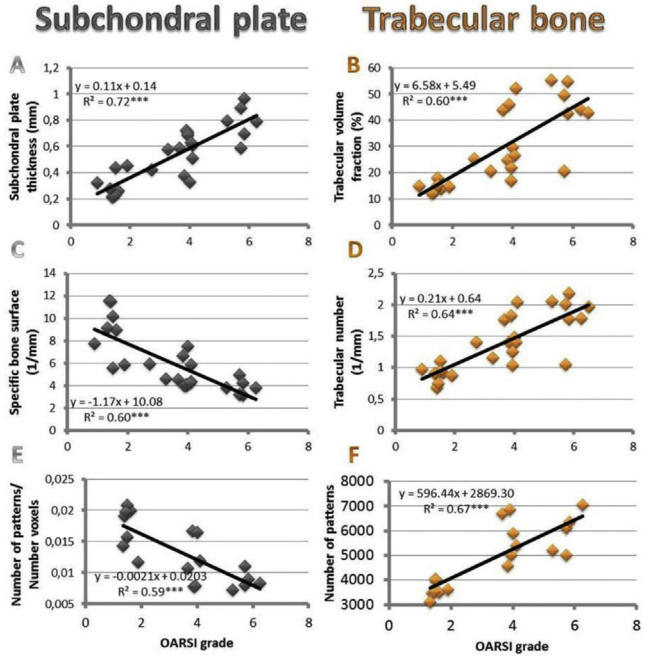

Figure 2. Correlations between OARSI grade and properties of subchondral plate (grey dots) and trabecular none (orange dots). On the left column, A) subchondral palte thickness (mm), C) specific bone surface (mm^{-1}) and E) number of different local binary normalized to number of analyzed voxels. On the right column, B) trabecular bone volume fraction (%), D) trabecular number (mm^{-1}) and F) number of different local binary patterns. ***p<0.001.

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EFFECT OF CHONDROITIN SULPHATE AND GLUCOSAMINE IN COMBINATION IN AN ANIMAL MODEL OF OSTEOARTHRITIS AND OSTEOPOROSIS

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Purpose: Osteoarthritis (OA), the most common form of arthritis, is now recognized as a disease of the whole joint involving all joint tissues. Cartilage loss is a major pathologic feature of OA, but in addition it is suggested that subchondral bone might play an important role in the pathogenesis of OA. In the present study we explored whether the combination of chondroitin sulphate (CS) and glucosamine hydrochloride (GLU), both symptomatic slow-acting drug for osteoarthritis (SYSADOA), could protect subchondral bone and articular cartilage from degeneration in a combined rat model of Osteoporosis (OP) induced by ovariectomy and OA induced by anterior cruciate ligament transection (ACLT).
Methods: OP was induced by ovariectomy in female Wistar rats (180–200 g body weight, $n = 15$ rats/group) (week 0) and 2 weeks after (week 2) OA was induced by Anterior Cruciate Ligament Transection (ACLT). All surgical procedures were carried out under deep anaesthesia with isofluorane (1.5 minimum alveolar concentration) which was followed by the subcutaneous injection of butorphanol (2mg/kg). Animals were maintained at a temperature of 21±2°C, with a 12 hour light/dark cycle and with free access to food and tap water. The combination was administered daily (oral gavage) at two doses from week 0 until week 12 after ovariectomy. The low dose was 140 mg/kg/day and the high dose 175 mg/kg/day which correspond approximately to 1200 mg/day and 1500 mg/day in humans. A Control Group and an ovariectomized + ACLT Group (Vehicle Group) were also included. After week 12, animals were sacrificed. For the assessment of OA, histology was performed and cartilage degeneration was evaluated by means of the OARSI score. Bone microarchitecture was assessed by microCT.
Results: Treatment has been shown to induce a significant reduction (approximately 80%) of the cartilage degradation and of the proteoglycan depletion (approximately 70%). This was accompanied by a significant reduction of Metalloprotease-3 and IL-1 levels. In addition, microCT revealed that the treatment exerted a positive effect in bone structure. This protective effect in bone loss was correlated with an increased ratio of Osteoprotegerin/RANKL.
Conclusions: The combination has been shown to induce significant effects in osteoarthritis and to have a protective role in bone. All these data may help to understand how Chondroitin and Glucosamine exert a positive effect in Osteoarthritis pathophysiology.

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A COMPARATIVE STUDY OF DIAGNOSTIC AND IMAGING TECHNIQUES OF THE TRAPEZIUM BONE IN RIZOARTHROSIS

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Purpose: Osteoarthritis of the trapeziometacarpal joint, known as rizoarthrosis, is a common rheumatic and disabling condition that occurs in 20% of women and 6% of men over 45 years old. At present, conventional radiography is the gold standard diagnostic tool for the clinical evaluation of the severity and progression of rizoarthrosis. Although x-ray is a fast, inexpensive, non-invasive and non-destructive technique, its inability to perceive precisely the articular cartilage and other structures offers a scarce diagnosis and incomplete details on subchondral bone defects. The aim of our research is to determine whether micro-CT can be regarded as a reliable investigation method to evaluate the severity of osteoarthritis in the trapezium bone, in particular, we developed a novel micro-CT scoring system based on a quantitative assessment of the subchondral bone thickness.
Methods: This study compared different diagnostic and imaging techniques performed consecutively on each sample: x-ray, visual analysis,