Cartilage calcification is a consequence of aging

Cartilage calcification is associated with knee osteoarthritis (OA). A study by Mitsuyama *et al.*, however, suggests that calcification is primarily a consequence of aging rather than OA.

A total of 106 knee blocks from 56 donors (31 males; average age 50.3 years, range 12–74) were examined; after the condyles were cut into 7–10 mm slabs, high-resolution images were obtained using a Faxitron radiography system to visualize cartilage calcification. The cartilage surface was also assessed visually for signs of fibrillation or erosion and graded on a 4-point scale, where grade 1 represents normal appearance, and grade 4 is cartilage eroded to the bone. A significant correlation was found between percent cartilage calcification and age; this relationship remained when OA condyles were omitted from the analysis. No relationship was found between calcification and OA; increases in calcification were seen between grade 1 and grade 2 cartilage, but no further increases were observed in grade 3 or 4 condyles.

The authors suggest that calcification is a consequence of age-related changes in cartilage composition (e.g. water and proteoglycan content), and might contribute to the progression of OA.

Original article Mitsuyama H *et al.* (2007) Calcification of human articular knee cartilage is primarily an effect of aging rather than osteoarthritis. *Osteoarthritis Cartilage* **15:** 559–565

Quadriceps electrical stimulation is effective for the treatment of knee osteoarthritis

In patients with knee osteoarthritis (OA), pain and dysfunction cause a reflex inhibition on the quadriceps femoral muscle, and quadriceps weakness could accelerate damage to knee cartilage. Electrical stimulation can lead to pain relief, but few studies assessing the effectiveness of electrical stimulation therapy in patients with knee OA have been performed. A trial has now shown that electrical stimulation of the quadriceps is effective for the treatment of knee OA, and could be an alternative therapy to exercise.

The trial enrolled 50 patients with knee OA: 25 patients in an electrical stimulation program and 25 patients in an exercise program. Patients in the exercise program used biofeedback instrumentation, which transduces muscle potentials into auditory or visual information, and has been shown to increase the motivation and cooperation of patients undergoing exercise therapy. Both groups received 20 min of therapy 5 days a week for 4 weeks.

Pain, physical function and stiffness, functional performance, and muscle strength improved significantly in both groups, but no significant differences were detected between the groups. The authors suggest that electrical stimulation of the quadriceps could be used for patients with knee OA who have difficulties performing, or who have contraindications to, exercise programs. Long-term studies of the effects of electrical stimulation are warranted.

Original article Durmus D *et al.* (2007) Effects of quadriceps electrical stimulation program on clinical parameters in the patients with knee osteoarthritis. *Clin Rheumatol* **26:** 674–678

Potential novel therapeutic for the treatment of RA

Rheumatoid arthritis (RA) tends to improve during pregnancy, and this improvement coincides with a rise in maternal and fetal α-fetoprotein levels. In animal models of autoimmune diseases, α-fetoprotein has had immunomodulatory effects. A phase IB trial has now demonstrated the safety and potential efficacy of MM-093 (Merrimack Pharmaceuticals, Cambridge, MA, US)—a non-glycosylated version of human α-fetoprotein produced in the milk of transgenic goats—in patients with RA.

The trial included 12 patients who had active RA of at least 6 months' duration, and who had been taking methotrexate ≥10 mg per week for at least 2 months. Treatment with oral corticosteroids and NSAIDs were permitted during the study as long as the doses were stable; however, injected corticosteroids, immunosuppressive drugs and biological therapeutics were not permitted. Patients were randomly allocated to receive placebo ($n = 4$) or MM-093 23.1 mg ($n = 8$), which were both injected subcutaneously every week for 12 weeks.