

# Weight Loss in OA Modifies Cartilage Structure

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ROME — Weight loss in obese patients with knee osteoarthritis has been shown for the first time in a prospective study to have beneficial structure-modifying effects upon knee cartilage.

This is a finding with enormous public health implications. Weight loss now becomes the only therapy ever shown to have salutary structural effects on knee articular cartilage. No drug has yet been shown to have such a benefit, Dr. Ana Ananda noted at the meeting.

"We found that with a mean weight loss of 9%, which is fairly achievable... we can make meaningful, clinically important differences in terms of cartilage structure," said Dr. Ananda, a rheumatologist at the University of Sydney.

She presented the results of MR imaging studies conducted before and again 12 months after a weight-loss intervention in a group of patients with knee osteoarthritis and a body mass index greater than 35 kg/m<sup>2</sup>.

Patients who achieved at least a 9% reduction in body weight at the 1-year mark demonstrated a significantly lower rate of loss in cartilage thickness in the medial compartment, compared with those who had lesser weight loss or weight gain at follow-up.

Patients with significant weight loss also showed improvement in cartilage quality, as reflected in increased proteoglycan content seen on delayed gadolinium-enhanced MRI. Evidence from other studies suggests loss in proteoglycan is perhaps the earliest osteoarthritis-induced change in cartilage.

In all, 78 patients had baseline and follow-up measurements of knee cartilage thickness as a proxy for cartilage volume. Of these, 28 underwent bariatric surgery involving laparoscopic adjustable gastric banding with a mean 1-year weight loss of 17.5%, in contrast to the mean 2.5% weight loss in patients who participated in a dietary weight-loss program.

The MRIs showed a graded inverse relationship between the percent weight loss and the rate of loss in cartilage thickness in the medial compartment, through which most of the load on the knee joint is transmitted. This relationship remained significant in a multivariate analysis adjusted for age, sex, baseline BMI, and knee range of motion.

The delayed gadolinium-enhanced MRI studies were done in 54 patients. The 24 with surgical weight loss demonstrated a mean 56-msec increase in delayed gadolinium-enhanced MRI index in the medial compartment during 1 year of follow-up, reflecting a substantial increase in cartilage proteoglycan content.

In contrast, the 30 patients with lesser, nonsurgical weight loss had a mean 23-msec decrease in the index. In a multivariate analysis, for every 10% loss in body weight, a patient's cartilage proteoglycan index improved by about 40 msec.

A second study concluded that sub-

stantial weight loss has a chondroprotective effect, according to a study that assessed pain scores, joint biomarkers, and markers of systemic inflammation.

Dr. Pascal Richette of Lariboisière Hospital, Paris, reported on 44 obese patients with knee osteoarthritis who underwent bariatric surgery, with a resultant 20% decrease in BMI.

At 6 months post surgery, the group's mean osteoarthritis pain scores had

dropped from a baseline of 50 out of a possible 100 points to 24.5 points. This was accompanied by significant functional improvement as measured on the WOMAC (Western Ontario and McMaster Universities) osteoarthritis index subscales.

Serum levels of N-propeptide of type IIA procollagen (PIIANP), a biomarker of cartilage type II collagen synthesis, increased by 32%. Serum levels of cartilage oligomeric matrix protein (COMP), a bio-

marker for cartilage degradation, were down by 36%. Serum levels of interleukin-6 decreased by 26% from baseline, high-sensitivity C-reactive protein was down by 46%, and fibrinogen decreased by 5%, all indicative of reduced systemic inflammation. In addition, serum lipids and insulin resistance were significantly reduced. ■

**Disclosures:** Dr. Richette and Dr. Ananda reported having no conflicts of interest.

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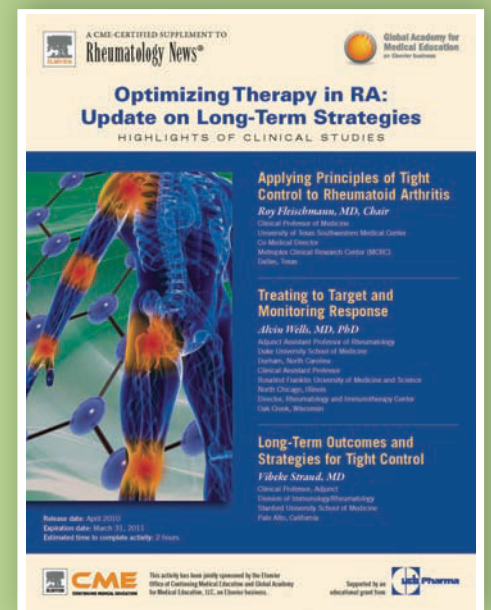
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