

445 SYNOVITIS ASSOCIATED WITH QUADRICEPS WEAKNESS IN PERSONS WITH OSTEOARTHRITIS OF THE KNEE: RESULTS FROM THE AM-OA COHORT

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Purpose: To explore associations between tissue abnormalities (bone marrow lesions, effusion, synovitis, cartilage loss and osteophytes) visualised by MRI, with both biomechanical impairments (proprioceptive inaccuracy, laxity, quadriceps and hamstrings weakness) and clinical symptoms (pain, stiffness, activity limitations and crepitus) in a cohort of patients with knee osteoarthritis (OA).

Methods: Cross-sectional study in 105 patients with knee OA from the Amsterdam Osteoarthritis cohort. Multivariable regression analyses were used to explore associations between MRI features in each compartment with OA symptoms.

Results: Associations were found between presence of synovitis with quadriceps weakness ($p=.004$) and between severity of cartilage loss in the patellafemoral compartment with quadriceps weakness ($p=.035$). No associations were found for proprioceptive inaccuracy, laxity and hamstrings weakness. Medial tibiofemoral cartilage loss was the only MRI feature associated with pain and activity limitations. In contrary, all MRI features, except for synovitis, were found to be associated with the presence of crepitus.

Conclusions: As we far as we know, this is the first study to find a significant association between synovitis and quadriceps weakness. This relationship was independent of pain severity. It may imply that strategies that decrease inflammation might be valuable to prevent clinical deterioration in OA patients. Since inflammation had not been identified by physical examination in most cases with MRI-assessed synovitis, MRI can play an important role in clinical assessment of knee OA patients.

446 METABOLIC DISTURBANCES IDENTIFIED BY SPECT-CT IN PATIENTS WITH A CLINICAL DIAGNOSIS OF SACROILIAC JOINT INCOMPETENCE

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The sacroiliac joint (SIJ) as a source of lower back pain is a controversial issue. There is literature on its role as part of the pelvic girdle pain syndrome in the peri-partum period. In the absence of an adequate imaging test, firm clinical criteria for the diagnosis have been established. There is little literature on trauma as a cause of SIJ dysfunction. We examined the role of hybrid scintigraphic imaging in a population with SIJ dysfunction on the basis of both trauma and peri-partum lower back pain. **Methods.** Patients who fulfilled the published criteria for pelvic girdle syndrome either on the basis of peripartum SIJ dysfunction or trauma were entered into the trial prospectively. These patients were imaged with standard bone scintigraphy with the addition of hybrid imaging with SPECT/CT. Studies were blindly reported together with a control group without lower back pain and a second group with non-specific low back pain.

Results. The study group comprised 100 patients (72F, 28M) who fulfilled the criteria for SIJ dysfunction. Of these 52% gave a history of trauma and the remainder were patients with peri-partum pain. Average age was 43 years and average length of history was > 2 years. The major finding was of increased uptake in the upper SIJ and posterior soft-tissues/ ligaments. Hybrid imaging had a sensitivity of 95% and specificity of 99%. Positive predictive value was 99% and negative predictive value 94%. Reproducibility of the test is good with kappa values of 0.85.

Conclusion. Hybrid imaging with SPECT/CT reproducibly demonstrates metabolic alterations around the SIJ in patients with SIJ dysfunction, which we have termed SIJ incompetence. The condition is more common than

previously recognized and frequently occurs after trauma, which has not been reported previously.

447 EXTENT OF TIBIOFEMORAL OSTEOARTHRITIS PRIOR TO KNEE ARTHROPLASTY: MULTICENTER DATA FROM THE OSTEOARTHRITIS INITIATIVE

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Purpose: Knee arthroplasty is traditionally recommended for persons with knee joint failure due to osteoarthritis (OA). Systematically obtained evidence describing the extent of tibiofemoral arthritis in patients prior to knee arthroplasty is lacking. Our purpose was to use data from the multicenter Osteoarthritis Initiative (OAI) to quantify diagnoses of the extent and type of tibiofemoral OA in persons who underwent knee arthroplasty less than 1 year prior to a standardized knee radiograph.

Methods: All persons in the OAI had yearly 20-degree fixed flexion standing knee radiographs over a 3-year period. Z-tests were used to determine if the proportion of patients with Kellgren-Lawrence grades ≥ 3 differed from literature-based estimates.

Results: 116 persons from communities in 4 US locations underwent knee arthroplasty during the three-year follow-up period. The proportion of persons with KL grade ≥ 3 was 0.81 (95% CI, 0.73, 0.89) and was significantly lower than the 0.95 estimated population proportion ($p < 0.001$). A total of 82 of 97 pre-surgical knees (85%) had at least one tibiofemoral joint compartment that had no joint space narrowing.

Conclusions: Variation in the extent of tibiofemoral OA in patients preparing for joint arthroplasty is greater than previously described. The data suggest that approximately 1 in 6 patients undergo knee arthroplasty with a Kellgren Lawrence grade of 2 or less. In addition, the great majority (85%) patients who undergo knee arthroplasty have definite tibiofemoral joint space narrowing in only one compartment. These data strongly suggest that a substantial number of patients are undergoing knee arthroplasty earlier in the disease process than has been previously documented. Additional research is needed to confirm these findings and to understand the reasons for the variation in the extent of arthritis prior to knee arthroplasty.

KL grades for 96 patients who had knee arthroplasty within 1 year of radiograph

KL Grade	Frequency	Percent	Cumulative Percent
0	1	1.0	1.0
1	8	8.3	9.4
2	9	9.4	18.8
3	36	37.5	56.3
4	42	43.8	100

448 SHORT TERM CHANGES IN BONE MARROW LESION (BML) VOLUME IN KNEE OSTEOARTHRITIS

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Background: Bone marrow lesions (BMLs) show evidence histologically of bone damage or microfracture, and are related to malalignment, to pain and to OA progression. BMLs have been shown in observational studies to change in volume within 1 year follow-up. More recently we have shown changes in knee OA detectable within 6 weeks. The aim of this analysis was to determine whether changes in BML volume can be detected within an even shorter time interval and whether a treatment effect signal could be observed with small numbers of subjects.

Methods: Men and women aged 40 years and older with painful knee OA and who met ACR criteria for the disease were recruited for participation in an ongoing open label clinical trial of intra-articular steroid therapy. Subjects who took part in the study had significant knee pain and grade 2 or higher knee OA. They had a baseline magnetic resonance image (MRI) prior to having a steroid