How is tibiofemoral osteophytosis manifested in physical knee examination in individuals with knee symptoms but without joint space narrowing?

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INTRODUCTION: Osteophytes are frequently observed structural features linked to osteoarthritis (OA). Our aim was to explore the manifestation of possible tibiofemoral osteophyte formation in knee physical examination of symptomatic knees without radiographically detected joint space narrowing, namely, in knees that are not conventionally categorized as having OA.

METHODS: We used the Osteoarthritis Initiative (OAI) open access database (http://www.oai.ucs.edu), approved by the local institutional review boards. The OAI comprises data of 4796 men and women aged 45–79 years at baseline. We selected subjects, from the following two sub-cohorts: 1) progression cohort, individuals with symptomatic knee OA (n=1390); 2) incidence cohort, individuals at risk for knee OA (n=3284). Crepitus was examined at baseline by placing the palm of the hand over the patella to detect the presence of a continuous grinding sensation during passive knee flexion-extension movement in the supine position. We included subjects with no joint space narrowing (OARSI grade 0) but no or doubtful marginal tibiofemoral osteophyte (OARSI grade 0-1) in either knee at baseline based on fixed-flexion posteroanterior knee radiographs. We further required subjects to have answered YES to the following question at baseline for the knee to be included: "*Do you have knee pain, aching or stiffness for more than half the days of a month during the past 12 months?*" Only one knee per subject was randomly included if both knees were eligible. We used unconditional logistic regression to evaluate the association between the possible tibiofemoral osteophyte formation with knee-related physical examination, namely, quadriceps tendinitis, crepitus. effusion (confirmed with a positive bulge sign), knee pain/tenderness during flexion, medial and/lateral joint line tenderness, and the presence of Heberden's nodes. We only used the baseline data and also adjusted our model for age, sex, and body mass index (BMI) as covariates.

RESULTS SECTION: We included 557 subjects with no or little radiographic evidence of OA but with a symptomatic knee (62% women, mean [SD] age 58.9 [8.5] years, BMI 28.3 [4.9] kg/m^2. Our results indicated that among all included physical exams, presence of possible tibiofemoral osteophytosis was associated with higher likelihood of only crepitus and effusion (**Table 1**).

DISCUSSION: The presence of doubtful tibiofemoral osteophytosis evident on X-rays of symptomatic knees is correlated with the presence of crepitus and effusion. Consequently, these symptoms could be considered for identification of subjects at the symptomatic early-stages of osteoarthritis. A notable limitation is the lack of systematic assessment of radiographic alterations in the patellofemoral joint within the OAI. Furthermore, the yet-to-be-determined prognostic value of crepitus and effusion in the development of established symptomatic radiographic knee OA (Kellgren and Lawrence grade 2 or worse) poses a significant question.

SIGNIFICANCE: Despite being overlooked, physical examination might be able to help with earlier diagnosis or the formulation of classification criteria for early-stage symptomatic knee OA. Detecting OA in its early stages could present a window of opportunity for intervention before significant biomechanical disturbances and substantial joint integrity deterioration take place.

Table 1. The association between possible tibiofemoral marginal osteophytosis and physical examination, respectively, in 557 subjects with a symptomatic knee but without joint space narrowing

Outcome	Crude odds ratio (95% CI)	Adjusted* odds ratio (95% CI)
Quadriceps tendinitis	0.8 (0.6 – 1.3)	0.8 (0.5 – 1.1)
Crepitus	1.9 (1.4 – 2.8)	1.8 (1.2 – 2.6)
Effusion	2.9 (1.6 – 5.4)	2.9 (1.6 – 5.5)
Knee pain/tenderness during flexion	0.9 (0.6 – 1.3)	0.8 (0.5 – 1.2)
Medial and/lateral joint line tenderness	1.2 (0.8 – 1.7)	0.95 (0.7 – 1.4)
Presence of Heberden's nodes	1.1 (0.8 – 1.5)	1.0 (0.7 – 1.4)

CI: confidence interval.
*Unconditional logistic regression adjusted for age, sex, and body mass index.