Comparing Range of Motion in a Patient's Symptomatic and Asymptomatic Knees: A Predictor of Pathology

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Abstract:

Introduction: Diagnosing the pathology associated with knee pain is a complicated task that incorporates little quantitative measures and often leads to biased and often unnecessary referrals. A simple, cheap, and quantitative measure of intra-articular knee pain must be incorporated into the primary care physician decision matrix to produce referrals more conducive to surgical intervention. We asked (1) if a 10 degree difference in range of motion (r.o.m.) will correlate to clinically significant intra-articular pathology, (2) if a differences in age, sex, and BMI within the patient population will cause a significant variation in knee r.o.m., and (3) if patient’s with Medicaid will present with greater knee r.o.m. discrepancies than patients with private insurance or Medicare due to a lack of access to care.

Methods: This was a retrospective cohort study on 110 patients. They were selected based on the following criteria: (1) No history of contralateral knee pain, injury, or surgery (2) range of motion data collected using a goniometer on both knees at time of diagnosis. (3) MRI confirmed diagnosis of Meniscus tear with ICD9 codes: 717.3, 717.2, 717.42, 717.40, 717.49, 836.1. Patient’s Age, Sex, BMI, Surgical Treatment, Kellegren Lawrence and Albeck X-ray grades, and Insurance coverage was collected to determine if these factors had any effect on knee r.o.m.

Results: We found that patients diagnosed with operable derangement of the medial or lateral meniscus averaged a 26 degree reduction in knee flexion, with 97% of those patients having a reduction of 10 degrees or greater, when comparing the symptomatic knee to the unaffected knee. Patients with a BMI over 30 had significant difference in both symptomatic and unaffected knee r.o.m., P values of 0.042 and 8.41E-07 respectively, while age and sex showed no significant variation. The only significant correlation in insurance coverage involved symptomatic r.o.m. between those patients with Medicaid and those insured privately, P-value of 0.042.

Discussion and Conclusion: Our evidence suggests that a pathologic difference of 10 degrees or more between knees may be indicative of a meniscus tear and may be a useful screening tool when evaluating for meniscus tears. Further investigation is necessary to determine the validity of using r.o.m. as a measure for other intra-articular pathologies. Additionally, the significant difference in symptomatic knee r.o.m. between privately insured patients and those with Medicaid warrants further exploration into the source of this disparity.
Presentation Preference (Complete): Paper
Category (Complete): Knee- Meniscus (Sports Med/Arthro)
Keyword (Complete): Injuries ; Meniscus ; Research / Clinical
Research Type & Summary (Complete):
  *Research Type: Clinical Science
  *Summary Sentence: This study suggests that a 10 degree difference in range of motion between a patient’s symptomatic and asymptomatic knees correlates to operable meniscus tears and can act as a guide for referral.

Additional Information (Complete):
  *Has this information been presented or published at the national level?: No
*Are your research subjects living humans or animals?: Yes

*Were any patient records or imaging studies reviewed for this study?: Yes

*Does this research use only biomechanical testing, data from published articles, databases or specimens that are publicly available?: No

*Number of subjects: 110

*Type of investigation: Retrospective

*Randomization: N/A

*Control Group: Yes
  *FDA Status: This presentation does not describe the use of devices or pharmaceuticals
  *Was this research approved by an Institutional Review Board (IRB) or ethics committee?: EXEMPT, No Patient Health Identification (PHI) was recorded. i.e. No medical record numbers, names, social security numbers or birthdays
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