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The Relationship between Knee Valgus and Clinical Measures in Professional Basketball: A CART Analysis

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The Relationship Between Knee Valgus and Clinical Measures in Professional Basketball: A CART Analysis

Philip Anloague, Donald Strack, Carl Eaton, Joshua Corbeil, Steven Short, Paul Insana, Stephanie Nazario

Background

Lower extremity injuries occur at an amplified rate in professional basketball. Evidence suggests that knee frontal plane valgus may be associated with risk of injury. The Landing Error Scoring System includes the assessment of maximum knee valgus during a countermovement jump. The investigation of interactions among linear and non-linear factors may help the understanding of the interdependence of various measures and poor performance on the knee valgus displacement (KVD) component of the LESS in professional basketball players.

Purpose/Hypothesis

The purpose of this study was to investigate predictors of knee valgus displacement on the LESS. We hypothesize that a positive finding on the knee valgus displacement component of the LESS will be predicted by select clinical measures.

Subjects

47 active professional basketball players participated in the study (27 frontcourt players; 20 backcourt players). 82.9% were right limb dominant, 17% were left limb dominant.

Methods

Measurements were completed as part of preseason mobility screening prior to the 2015-16/2016-17 NBA seasons. Classification and Regression Tree Analysis (CART) were used to investigate linear and non-linear interactions among predictors and their influence on KVD in players who performed the LESS test.

Results

Of the 47 players included in this study, 31 players scored positive for KVD on the LESS test. Pruning resulted in 4 splits ($r^2=0.507$) demonstrating that KVD was predicted by total hip rotation range of motion, dominant leg hip external rotation, and standing arch height index measures. Predictive modeling, following pruning, classified 18 of the 31 players with KVD and 8 of the 16 players who did not test positive for KVD. The area under the Receiver Operating Curve reported was 0.9183, suggesting that classification of players using this model was not random.

Conclusion

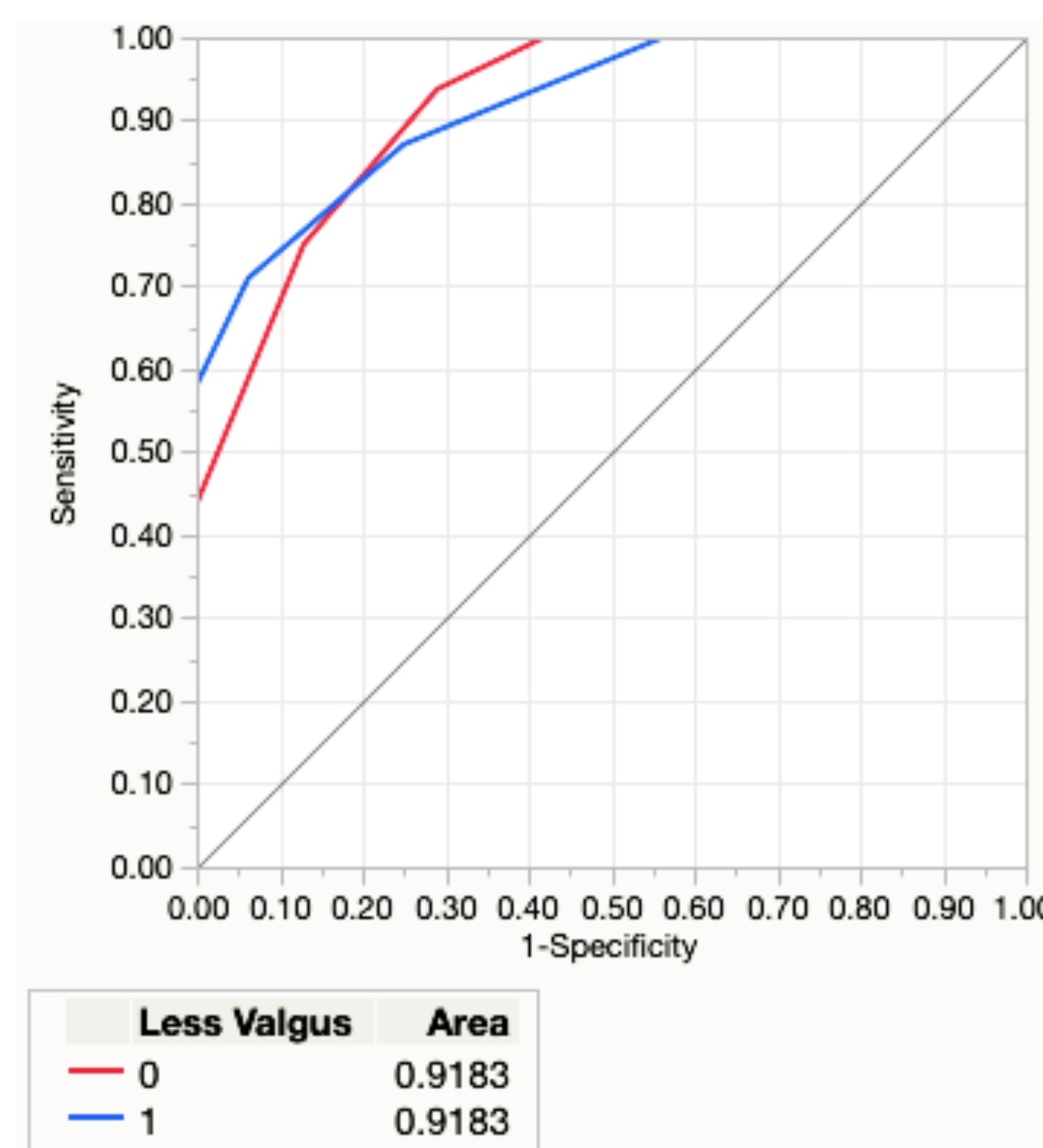
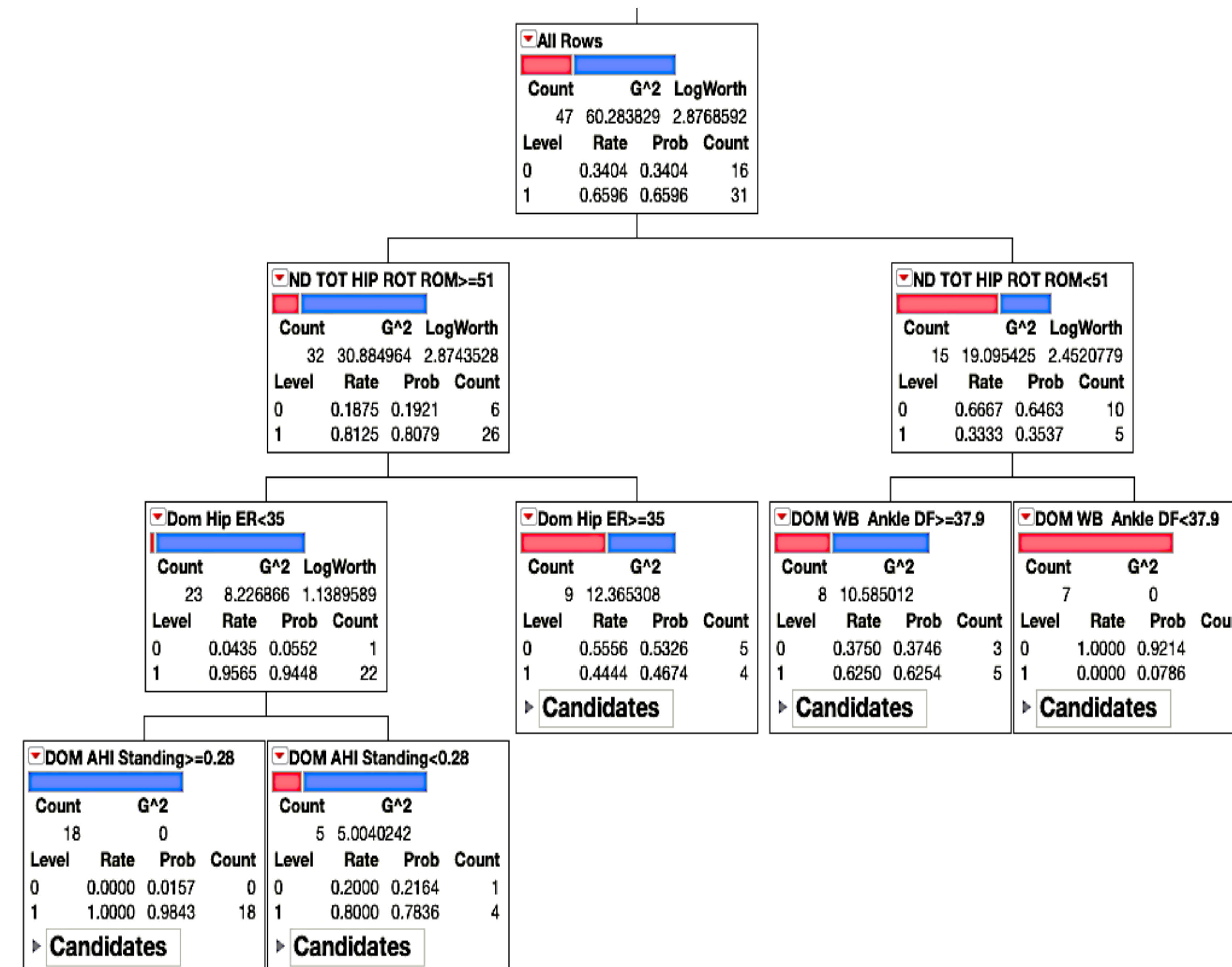
Knee valgus displacement and performance on the LESS has been linked with injury. CART analysis captured linear and non-linear interactions between clinical measures suggesting that lower extremity biomechanical factors may be associated with predicting KVD during performance on the LESS.

Clinical Relevance

Knee valgus displacement and the LESS test has been shown to be predictive of injury. Identifying which clinical measures may be linked with poor performance on this test may aid clinicians in determining appropriate interventions that may be associated with scores and minimize risk of injury.

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1. Oklahoma City Thunder Professional Basketball Organization, Oklahoma City, OK
2. Indiana Pacers Professional Basketball Organization, Indianapolis, IN
3. Denver Nuggets Professional Basketball Organization, Lakewood, CO