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Inter- and Intra-Observer Reliability of Predictive Models for the Non-Operative Healing Potential of Stable Juvenile Osteochondritis Dissecans (JOCD) Knee Lesions

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Summary:
Two orthopaedic surgeons, a radiologist and two medical students evaluated forty MRI cases of stable juvenile osteochondritis dissecans (JOCD) knee lesions using two different nomograms (Wall et al. and Krause et al.) developed for predicting non-operative healing potential, both of which demonstrated near perfect intra- and inter-observer reliability.

Abstract:
Background:
While juvenile osteochondritis dissecans (JOCD) lesions have greater healing potential than equivalent lesions in adults, only 50% of JOCD lesions demonstrate radiographic healing after 6 months of non-operative treatment [1]. Krause et al. [2] and Wall et al. [3] have described models to predict a patient's probability of healing with non-operative treatment based on patient and lesion characteristics. The Wall et al. [3] nomogram incorporates normalized lesion length, normalized lesion width, and pain type, while the Krause et al. [2] model includes normalized lesion width, patient age, and the size of concurrent cyst-like lesions. The reliability of such models in clinical practice is not known. The purpose of this study was to determine inter- and intra-observer reliability of the predictive nomograms.
Methods:
We retrospectively evaluated a consecutive series of children with open physes, who underwent non-operative treatment for a stable JOCD lesion by a single surgeon at a tertiary care center between 2008 and 2014. Thirty-four patients (40 knees) were included in the study. At two time points at least one week apart, two medical students, two orthopaedic surgeons, and a radiologist made measurements of the JOCD lesions as described by Wall and Krause. These measurements, along with patient ages and pain type, were used to generate a point value for each lesion based on both the Krause and Wall models [2,3]. Intra-class correlations (ICC) were calculated using the point value data obtained from the nomograms to determine inter- and intra-observer reliability.
Results:
Based on the Landis and Koch [4] threshold, we found near perfect intra-observer correlation for all raters in terms of individual OCD measurements (width of lesion in sagittal and coronal plane, total bicondylar width in the coronal plane, condylar width in area of lesion in sagittal plane, and cyst-like lesion width), as well as total point score as calculated by both Krause (ICC = .772-.901) and Wall methods (ICC= .831-.937). Additionally, amongst the five raters there was near perfect inter-rater reliabilities in total scores (ICC= 0.857 for the Wall total score and ICC= 0.843 for Krause total score), as well as substantial to near perfect reliability in measuring the individual components of the scores (ICC= 0.780-0.929).
Conclusions:

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There is high inter- and intra-rater reliability for both the Krause and Wall point systems for categorizing JOCD lesions. These models appear to be important tools for helping doctors and patients reliably predict the healing potential of non-operative management of JOCD lesions.

References:
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