**A MULTICENTER RELIABILITY TEST OF A NOVEL OSTEOCHONDRITIS DISSECANS RADIOGRAPHIC FEATURE CLASSIFICATION SYSTEM**

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**Purpose:** Approximately 30-50% of skeletally immature patients with stable osteochondritis dissecans (OCD) lesions of the knee fail to heal with non-operative treatment, and about 30% of patients who undergo surgery fail to heal.radiographically. Unfortunately it is nearly impossible to predict which patients will heal with non-surgical or surgical treatment. We identified multiple OCD features on standard radiographs that may help to predict healing rates. In this paper we test the inter- and intra- rater reliability of orthopaedic surgeons from multiple institutions on classifying these specific OCD radiographic features.

**Methods:** Pre-treatment anteroposterior, lateral, and notch radiographs of 45 pediatric knees containing OCD lesions of the medial or lateral femoral condyle were reviewed by 7 physician raters at different medical institutions at two time points. Images were viewed over a secure internet portal. Classifications included lesion location (medial/lateral), growth plate maturity (open/closing/closed), visibility of the progeny bone including fragmentation (yes/no), fragment displacement (none/partial/total), boundary (distinct/indistinct), shape (convex/linear/concave), and comparative radiodensity of the center and rim (more/same/less). Condylar width and lesion size were measured on all views. Inter-observer reliability was measured using free-marginal kappa (kf) and intraclass correlations. Intra-observer reliability was measured using Cohen’s kappa (kc), linear-weighted kappa (klw), and intraclass correlations depending on measurement type.

**Results:** Inter- and intra-observer reliability were excellent for classification of lesion location (kf=0.96, kc=0.97, respectively) and skeletal maturity (ICC=0.86, klw=0.84, respectively) and for measuring knee and lesion size on all views (ICC=0.92-0.98, ICC=0.84-0.95, respectively). The visibility, fragmentation, and displacement of the progeny bone were classified with substantial reliability over time (kc=0.67, kc=0.64, klw=0.80, respectively) and moderate reliability between raters (kf=0.45, kf=0.54, ICC=0.52, respectively). The progeny bone boundary demonstrated substantial reliability between raters (kf=0.62) and moderate reliability over time (kc=0.55). Fair to moderate inter- and intra-observer reliability was obtained for classifying the shape (ICC=0.33, klw=0.53, respectively) and comparative radiodensity of parent and progeny bone (ICC=0.11-0.52, klw=0.32-0.57, respectively).

**Conclusion:** Most of the specific OCD radiographic features tested showed good to excellent reliability. Lesion shape and density had only fair to moderate reliability.

**Significance:** The results of the current study support the use of OCD radiographic feature classification in multi-center investigations. Each reliable feature may be correlated with healing in future studies and help to predict OCD outcome at the start of treatment.