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

*Eric J. Wall, MD, Cincinnati, OH; John D. Polousky, MD, Centennial, CO; Kevin G. Shea, MD, Boise, ID; James L. Carey, MD, Philadelphia, PA; Theodore J. Ganley, MD, Philadelphia, PA;  
Nathan L. Grimm, BS, Boise, ID; John C. Jacobs Jr, BS, Boise, ID; Eric W. Edmonds, MD, San Diego, CA; Emily A. Eismann, MS, Cincinnati, OH; Allen Anderson, MD, Nashville, TN; Ben Heyworth, MD, Boston, MA; Roger Lyon, MD, Milwaukee, WI; Lucas Murnaghan, MD, MEd, Toronto, Ontario; Carl Nissen, MD, Farmington, CO; Jennifer Weiss, MD, Los Angeles, CA; Rick Wright, MD, St. Louis, MO; Gregory D. Myer, PhD, Cincinnati, OH*

**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.