

## Morphology of Patellofemoral (PF) Cartilage Wear Location in Cartilage Restoration Patients Without Known PF Instability

**Felipe Ambra, MD, BRAZIL**

Elizabeth A. Arendt, MD, UNITED STATES

Andreas H. Gomoll, MD, UNITED STATES

Julie Agel, MA, UNITED STATES

Will Freking, MS II, UNITED STATES

Jack Farr, MD, UNITED STATES

University of Minnesota

Minneapolis, Minnesota, UNITED STATES

### Summary:

One sentence summary (400 characters): Central groove lesions are associated with a deeper trochlear sulcus, and more congruous cartilage morphology. This may lead to more central trochlear stress. The paucity of trochlear dysplasia in this group of isolated PF lesions suggests that cartilage wear patterns may be more often bi-polar in patients with trochlear dysplasia.

### Abstract:

**Purpose:** To investigate the relationship of PF morphology as assessed by Magnetic Resonance Imaging (MRI) and PF cartilage wear patterns in a cohort of patients with symptomatic uni-polar lesions.

**Ho1:** Symptomatic Isolated central groove lesions are more frequent in patients without trochlear dysplasia, with deeper trochlear groove depth and sulcus angle, and with more symmetry in their PF articulation.

**Ho2:** Symptomatic Isolated patella cartilage lesions are more often associated with trochlear dysplasia, but can also be present without dysplasia.

**Methods:** Cohort: 82 knees, mean age 30 yrs. None had a history of PF instability. All were undergoing cartilage restoration for a uni-polar PF lesion. All had MRI, arthroscopic, and open surgical evaluation of cartilage location/grade. Only patients with ICRS grade 2-4 were included in this study. All trochlear lesions involved the central groove; lateral trochlear lesions were excluded. Imaging measurements were made on the MRI using cartilaginous landmarks and included trochlear sulcus angle (TSA) & patella median ridge angle (PMRA), trochlear (TFA) & patella facet asymmetry (PFA), and trochlear depth (TD). There were 44 patella & 38 trochlear lesions.  $TD < 3\text{mm}$ ,  $TFA < .40$ , &  $TSA > 145^\circ$  were used as indicators of trochlear dysplasia.

**Results:** Isolated central groove trochlear lesions: 100% had  $TD \geq 3\text{mm}$  &  $TFA \geq 0.4$ ; 63% had sulcus angles  $\leq 145^\circ$ . The mean sulcus angle for the patella group is  $149^\circ$  for the trochlea group is  $143^\circ$  ( $p = 0.001$ ). The mean trochlea depth is 4.3mm for the patella group and 5.4mm for the trochlear group  $p = 0.00$ .

Using facet asymmetry as a marker of congruency, the correlation between TFA & PFA is 0.32 ( $p = 0.04$ ) for patella group & 0.43 ( $p = 0.007$ ) for the trochlear group.

In this cohort of symptomatic patients with isolated (uni-polar) PF lesions, there was a paucity of uni-polar patellas with dysplastic trochlear morphology (13%).

**Discussion:** Our data supports both hypotheses statistically; the clinical significance of this is speculative due to the overlap in ranges of the data between the 2 groups.

The relationship between cartilage wear patterns in the lateral PF joint and trochlear dysplasia has been noted by other authors.

# ISAKOS

**International Society of Arthroscopy, Knee Surgery and  
Orthopaedic Sports Medicine**

11<sup>th</sup> Biennial ISAKOS Congress • June 4-8, 2017 • Shanghai, China

---

## Paper #123

Central groove lesions are associated with a deeper trochlear sulcus, and more congruous cartilage morphology. This may lead to more central trochlear stress. The paucity of trochlear dysplasia in this group of isolated PF lesions suggests that cartilage wear patterns may be more often bi-polar in patients with trochlear dysplasia.

Conclusions: Our data suggests that central trochlear groove lesions have a different mechanism of cartilage breakdown than dysplastic trochlear morphology. A more detailed analysis with multiple slices in both the axial (patella) and sagittal (trochlear) planes, and more refined ways to measure PF joint congruency are needed to define the role of patellar and trochlear morphology and cartilage wear.