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ACCURACY OF PATELLA ALTA ASSESSMENT IS POOR–DYNAMIC VS STATIC PATELLAR HEIGHT IN RELATION TO FEMORAL TROCHLEA

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PRESENTER DISCLOSURE INFORMATION

- In compliance with the Conflict of Interest Policies ISAKOS requires the following disclosure from the presenters:

- Petri Sillanpää MD PhD
  - Consultant: Inion Inc.
- Board memberships: FAKA (Finnish Arthroscopy & Knee Association)

PATELLA ALTA CAN BE DIFFICULT TO DETERMINE BASED ON STANDARD X-RAYS & MRI

The classic indices to define patella alta, such as IS and CD, are based on x-rays.

MRI has been used for analysis of the overlap between patellar and trochlear cartilage (Patella-Trochlea Index, PTI).

This study aimed to compare static MRI patella alta measurements to dynamic CT to assess patellar height. The study hypothesis was that static patella alta measurements may vary from dynamic assessment of patellar height.

J-tracking
(patella alta?)

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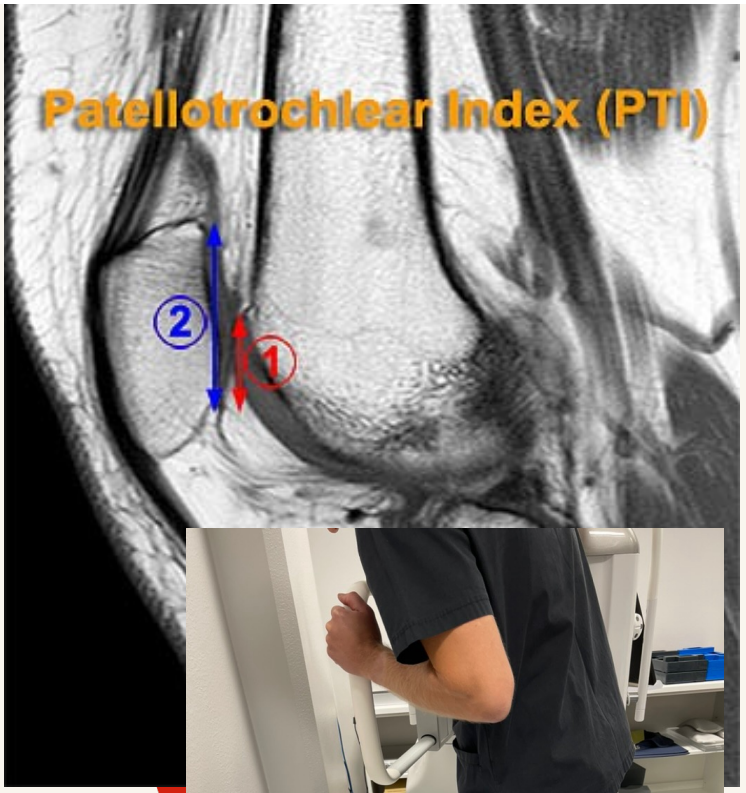
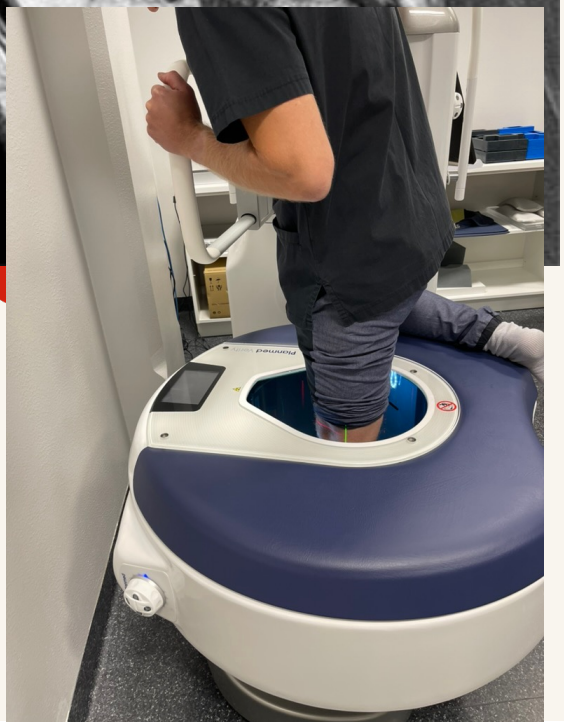
STUDY DESIGN & METHODS

- From patellar dislocation population, 29 patients underwent 3.0T MRI and dynamic Conical-Beam CT (CBCT) in one leg standing position, zero degree extension, and quadriceps muscles contracted (patellar tendon tight)
- Open platform CBCT allows the patient to stand on the indicated limb as in a normal stance, and imaging is finished within a few seconds
- Resolution of CBCT allows analysis of patellar and trochlear cartilage overlap as in MRI. Patellar height in relation to femoral trochlea was measured as overlapping of the patellar cartilage and femoral trochlea, described as PTI, < 15% indicating abnormal PTI and patella alta. CD and IS indices were measured as originally described. Additionally, the Lateral Trochlear Inclination (LTI) angle was measured to assess concomitant trochlea dysplasia and whether it affects to patellar height between MRI and CBCT
- Crude comparison between MRI and CBCT was performed with paired sample t-test and adjusted comparison in relation to LTI with linear mixed model analysis.

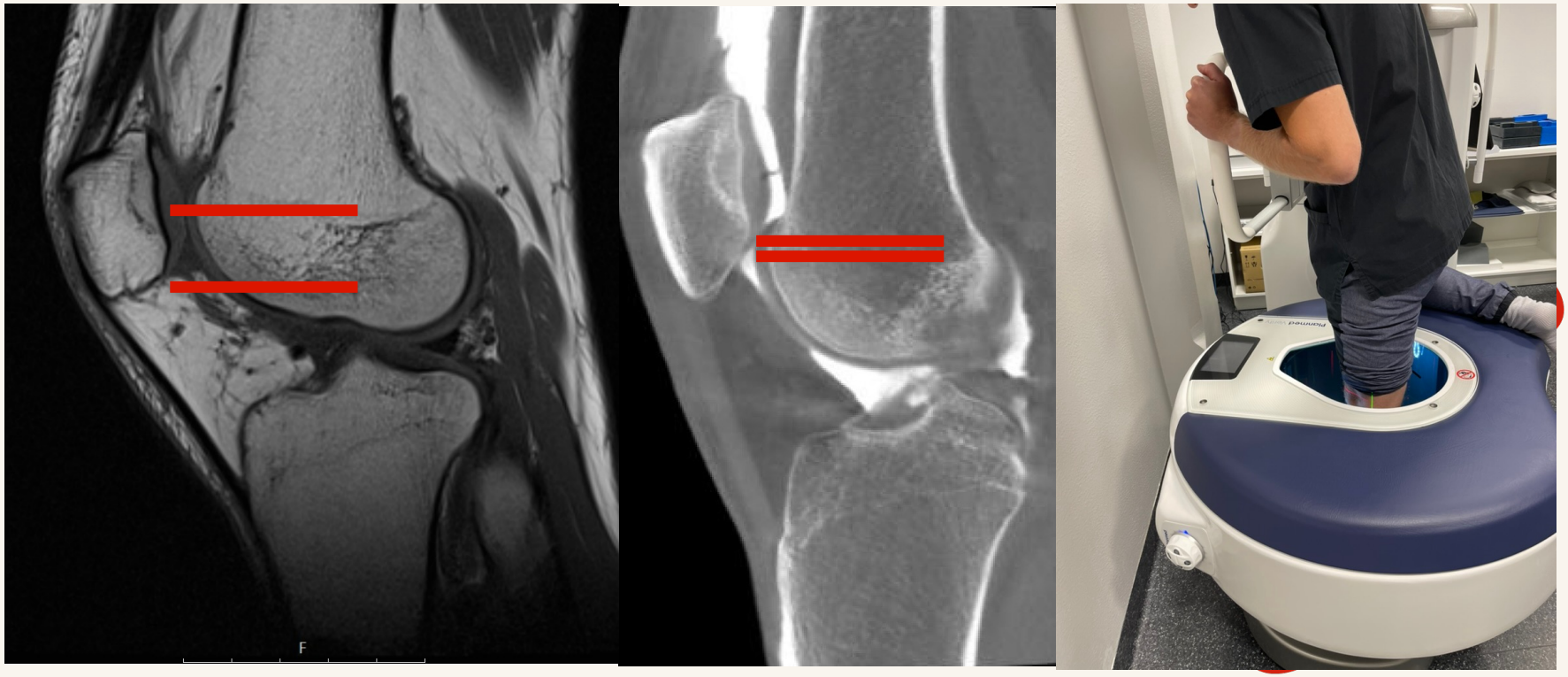




RESULTS

- Patellar height measurements resulted in lower values in standard static MRI compared to dynamic CBCT, when PTI or CD was used.
- PTI was mean of 28% lower (confidence intervals [95% CI] 21-35%, p<0.01) in dynamic CBCT than static MRI, indicating significantly more frequent patella alta diagnosis in dynamic assesment than measured on static MRI.
- CD was mean 10% less (95% CI 7-14%, p<0.01) in MRI than dynamic CBCT, indicating similarly more frequent patella alta diagnosis when measured by dynamic imaging modality. IS was similar in both imaging modalities, indicating an invaluable method for patella engagement to the trochlea.
- The distal cartilage margin of the patella in sagittal view was mean 4.4mm (range, 1.6-10.7mm) proximal in dynamic than static imaging,
- The presence of trochlear dysplasia (LTI <11 degrees) did not affect the measurement (PTI, CD and IS) behaviour between static and dynamic imaging, indicating a similarly increasing amount of patella alta diagnosis when assessed by dynamic CBCT.

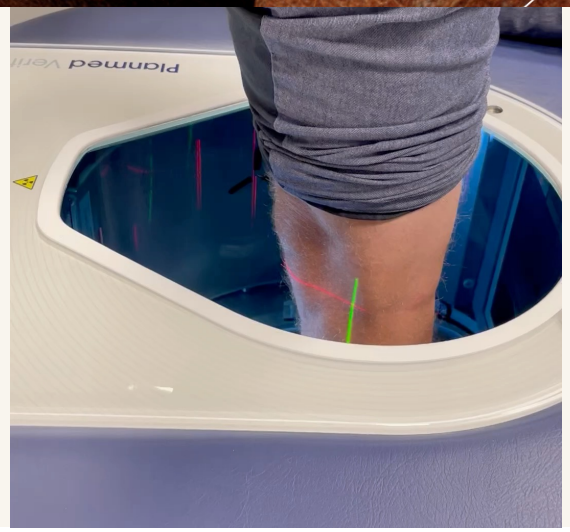
RESULTS



The distal cartilage margin of the patella in sagittal view was mean 4.4mm (range, 1.6-10.7mm) proximal in dynamic than static imaging. A case example of same patient, with static MRI (left) and dynamic CBCT (right) imaging modalities.

CONCLUSIONS

- Diagnosis of patella alta is difficult to determine, as dynamic and static imaging modalities result in significant differences when measuring patella-trochlea overlap
- Standard static MRI assessment of PTI results in significantly higher values than dynamic CBCT, indicating more frequent patella alta diagnosis when dynamic imaging modality is used.
- Dynamic imaging modality may be considered more precise method to assess patellar engagement within the trochlea.
- Care should be taken to diagnose patella alta solely based on MRI



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