



Patellofemoral joint is an under reported joint in MRI knee – A retrospective, cross-sectional study



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HIGHLIGHTS

- The Patellofemoral joint was not mentioned in 77% of the MRI Knee reports.
- A third of the cases had trochlear dysplasia.
- PFJ pathology is a significant cause of anterior knee pain.
- PFJ should be mentioned when reporting a MRI of knee.

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ABSTRACT

Background: Patellofemoral joint (PFJ) pathology accounts for upto 40% of cases of knee pain. It has been suggested that PFJ pathology may be underreported in Magnetic Resonance Imaging (MRI) Knee reports. The objective of this study was to elucidate whether PFJ was reported in MRI knee reports at our institution.

Materials and methods: A retrospective review of 103 consecutive Knee MRIs over a 2-month period was performed by an author, blinded to the reports, at our institution. We analysed whether PFJ was mentioned in MRI knee reports and whether any significant PFJ pathology was present in the scans of this cohort. Images were also reviewed for any underlying causes of PFJ pathology such as trochlear dysplasia (TD) that can result in patellar instability or maltracking.

Results: PFJ was not mentioned in 79/103 cases (77%). 24 cases had trochlear dysplasia. There was no association between PFJ reporting and trochlear dysplasia (p value = 0.50).

Conclusion: PFJ is not mentioned in the majority of Knee MRI reports. PFJ pathology is an important cause of anterior knee and should be reported.

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1. Introduction

Patellofemoral joint (PFJ) is a complex joint with a significant role in knee stability and mobility. PFJ pathology is an important cause of anterior knee pain in a third of active adults and almost 40% of adolescents [1]. PFJ instability and maltracking is an important biomechanical risk factor for cartilage injury and premature arthritis. MRI knee is a commonly performed investigation for knee pain. Hence, radiologists should also focus on PFJ while reporting a MRI of the knee. Accurate reporting of findings is

essential to plan treatment and decrease morbidity. Anecdotal note was made of lack of specific reporting of PFJ while reporting MRI knees in a District General Hospital in the United Kingdom (UK). The objective of this study was to determine if MRI knees reported in our centre by radiologists included specific comments on the PFJ. We also reviewed the images to assess for any underlying causes of PFJ pathology such as trochlear dysplasia (TD) that can result in patellar instability or maltracking.

2. Material and methods

A retrospective cross-sectional study was performed. A review

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Table 1

Table illustrating cases where PFJ was reported and cases, which had trochlear dysplasia (TD).

	PFJ	NO PFJ
TD	6	18
NO TD	18	61

Table 2

Table of cases of trochlear dysplasia classified according to Dejour classification.

TD (Dejour)	Numbers
A	20
B	2
C	2

of 103 consecutive MRIs that were conducted over a 2-month period, was performed by the senior author who is a consultant radiologist with significant experience in musculoskeletal radiology (RB). A 2 month period was chosen as we believed this would provide us with a good sample size of over 100 patients, predicted based on our usual numbers of MRIs performed per month at our institution. The MRIs had been performed for knee pain and had the standard sequences. These included T2 medic axial, T1 and STIR coronal, and T2FS axial. Patient demographics of this cohort were also collected. The scans were analysed by the author (RB) who was blinded to the report to reduce observer bias. PFJ was analysed for maltracking, trochlear dysplasia and chondral lesions. Subsequently the reports of these knees were assessed to see if the PFJ was mentioned and the relevant findings. The results were analysed using SPSS (version 22.0; SPSS Inc, Chicago, IL).

3. Results

103 patients with an average age of 48 years (range 17–103 years) were included in the study. There was no sex predominance (52 females and 51 males). Review of the MRI reports deciphered no mention of PFJ in majority of the cases 79/103 (77%). A review of all the MRI scans revealed 24 cases of trochlear dysplasia (TD), 20 cases of type A, 2 each of type B and C. (Tables 1 and 2; Figs. 1 and 2). Details of the classification are described elsewhere [2,3]. Of these

24 cases of TD, 18 were not reported and 3 of these had associated patellar subluxation. All cases of unreported trochlear dysplasia were less than 45 years of age. However, there was no significant difference in our study between PFJ reporting and non-reporting and their association with trochlear dysplasia ($p = 0.50$). 3 cases had Hoffa's pad impingement without MRI evidence of patellofemoral maltracking, which was also not reported.

4. Discussion

PFJ is one of the important causes of knee pain especially in young adults and athletes [4,5]. Chondral lesions of PFJ are associated with marked pain and decreased function. Isolated degeneration of articular cartilage of patellofemoral joint affects 13–24% of women and 11–15% of men [6]. Symptomatic isolated patellofemoral degeneration is noted in 5–8% of population [6]. Chondral lesions of PFJ are more common than medial and lateral tibiofemoral joint.

In a study by Wood and colleagues (5) of 57,555 patients who attended their GP practice, 1782 had knee related problems with 303 being identified as PFJ related. The prevalence of PFJ osteoarthritis (OA) is 2.3/10000 and bursitis 7.8/10000. This is a commonly seen pathology in general practice of young and adolescence. 25% of patients over the age of 50 with knee pain in their study had at least isolated PFJ OA. Consultation rates for OA in the general population are 50/10000 cases and that for PFJ OA in general practice, 7/10000 cases [5].

There are limitations in our study. Firstly, the study was performed in a single centre only and hence it may affect the external validity of the findings. Future work should aim for a multicenter study. Moreover, a single author was employed to review all images. Through blinding the author to the reports, observer bias was reduced. To improve reliability, more than one senior reviewer could be employed with calculation of inter-rater reliability. However, we felt confident with regards to obtaining reliable and consistent results by having one experienced consultant radiologist reviewing all the images. Patellofemoral maltracking is accepted as a probable cause of anterior knee pain especially in the young. (1) The degree of maltracking is not proportionally related to the PFJ symptoms. A small group of these have patellofemoral pain syndrome. Our subgroup analysis demonstrated a group of patients for whom PFJ was not mentioned and there was associated patellar

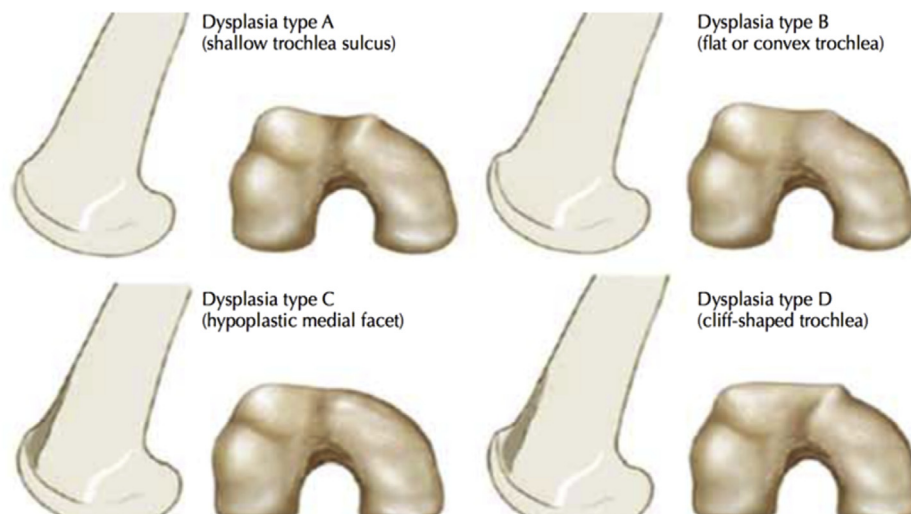


Fig. 1. Dejour classification of trochlear dysplasia (images reproduced with permission from Elsevier: Grelasamer RP, Dejour D, Gould J. The pathophysiology of patellofemoral arthritis. *Orthop. Clin North Am.* 2008; 39:269–74).

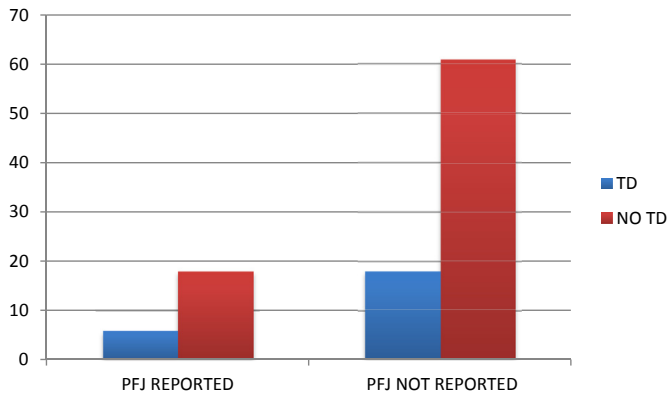


Fig. 2. Diagrammatic representation of cohort showing cases where PFJ was reported and cases, which had trochlear dysplasia (TD).

subluxation. The clinical relevance of this subgroup could not be ascertained and a larger prospective study with clinic-radiological correlation might be helpful to assess the morbidity and financial impact of our findings. In light of the limitations, further work is warranted however our early work demonstrates the PFJ is underreported and that PFJ reporting may enable patients to receive optimal management. The present work was reported in line with the process criteria [7].

5. Conclusion

PFJ pathology is a significant cause for anterior knee pain and if undiagnosed or unreported can cause significant morbidity. PFJ should be mentioned when reporting MRIs of knees.

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None of the participating authors have a conflicting financial interest related to the work detailed in this manuscript, nor do any of the authors maintain a financial stake in any product, device or drug cited in this report.

Ethical approval

N/A.

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Author contribution

Arun Khajuria: Conception and Design, Data collection, Analysis, Drafting, Critical review of manuscript.

Amit Shah: Design, Data collection, Analysis, Critical review of manuscript.

Ankur Khajuria: Design, Analysis, Drafting, Critical review of manuscript.

Rajesh Botchu: Conception and Design, Analysis, Critical review of manuscript.

Conflict of interest

No conflicts of interest to declare.

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