ISAKOS CONGRESS 2025 | MUNICH GERMANY June 8–11

Intra And Inter-Observer Reliability Of The D. Dejour V2 Classification For Trochlear Dysplasia Using Radiographs Combined With MRI

Michael J Dan, MBBS MSc(res) PhD FRACS(orth)

Lingard and Macquarie University Hospital

Edoardo Giovanetti de Sanctis, MD, Nicolas Cance, MD, Guillaume Demey, MD, and David H. Dejour, MD

Lyon Ortho Clinic France

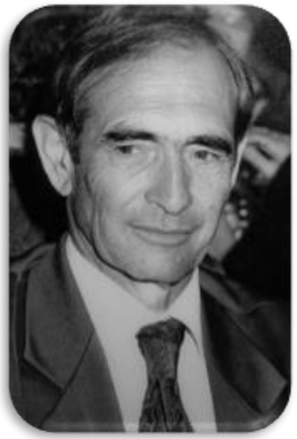
Faculty Disclosure Information

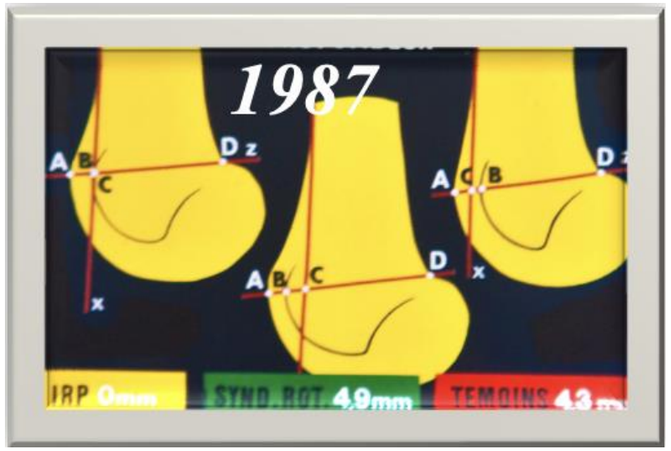
- Nothing to disclosure

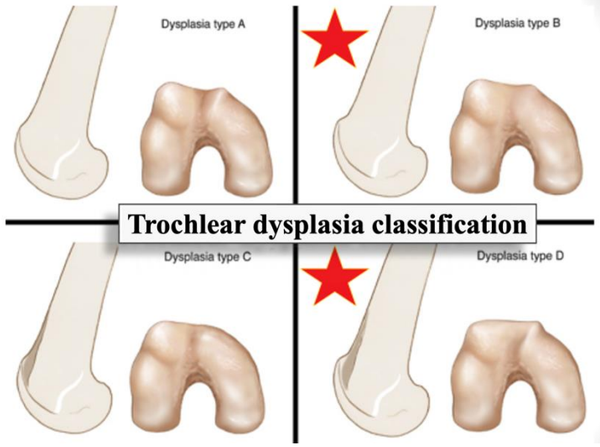
Introduction

The D.H. Dejour classification (V2) expanded upon H. Dejour X ray classification of trochlear dysplasia utilising **CT scans.**

MRI is now the main investigation of choice with novel MRI classifications since developed.







ISAKOS CONGRESS 2025 | MUNICH GERMANY June 8–11

Introduction

The **aim of this research** was to report the **reliability** of the Dejour V2 using a combination of **X-Rays and MRI, instead of CT scan** as per the original classification.

Introduction… more

Trochlea dysplasia poorly understood

Even editor of BJBJ states Dejour V2 grade C is **high grade= incorrect**

EDITORIAL OPEN ACC

Towards a better understanding of patellofemoral instability

a Tower of Babel challenge

Deiary F. Kader Samantha Jones Fares S. Haddad

In our practice, surgery – when indicated – involves addressing the soft-tissue disturbance caused by dislocation using MPFL reconstruction with additional distalization of the TT and medialization in selected cases. Trochleoplasty is reserved for severe cases of grade C and D Dejour dysplasia. There is a subset of patients with permanently dislocated patellae that track in the lateral gutter in flexion for whom several procedures may be required to ensure patellar stability.

∴ The **secondary aim** was to explore differences in the assessment of trochlear dysplasia, **providing insights for a more comprehensive future MRI classification** of trochlear dysplasia with improved observer reliability.

Methods

Retrospective comparative study

Reviewing a prospectively maintained institutional database, between two groups of patients: objective patellar instability (OPI), and control patients with no patellofemoral symptoms.

Inclusion criteria were: available pre-operative imaging including both knee MRI and a true lateral view radiograph of the knee at 20° of flexion and no history of previous knee surgery.

Imaging evaluation was performed independently by two orthopaedic surgeons, and each trochlea was classified according to the Dejour V2 classification. To classify, all reviewers used initially the lateral X-ray, then confirmed with MRI slice imaging.

Results

Reliability for Dejour V2 Normal and 4 grades of dysplasia

	Intra rater Reliability	Inter rater reliability
Overall	0.95	0.90
Control group	0.77	0.75
Objective patellar instability Patients	0.92	0.86

Vs Reliability for Dejour V2- normal vs High(B+D) vs low(A+C) grade of dysplasia

	Intra rater Reliability	Inter rater reliability
Overall	0.95	0.93
Control group	0.84	0.82
Objective patellar instability Patients	0.92	0.88

Results

Sensitivity and specificity for Dejour V2 Normal and 4 grades of dysplasia

	Normal	A	B	C	D
Sensitivity	98.6%	65.5%	90.9%	100%	98.3%
Specificity	96.2%	98.2%	97.0%	99.5%	99.3%

Vs

Sensitivity and specificity for Dejour V2- normal vs High(B+D) vs low(A+C) grade of dysplasia

	Normal	Low Grade	High Grade
Sensitivity	98.6%	83.8%	97.8%
Specificity	98.5%	98.2%	96.4%

Discussion

Excellent specificity **but only moderate sensitivity** of 65%, for diagnosing trochlea dysplasia

= very accurate in ruling out trochlear dysplasia but our ability to detect trochlear dysplasia could be improved in low grade trochlea dysplasia.

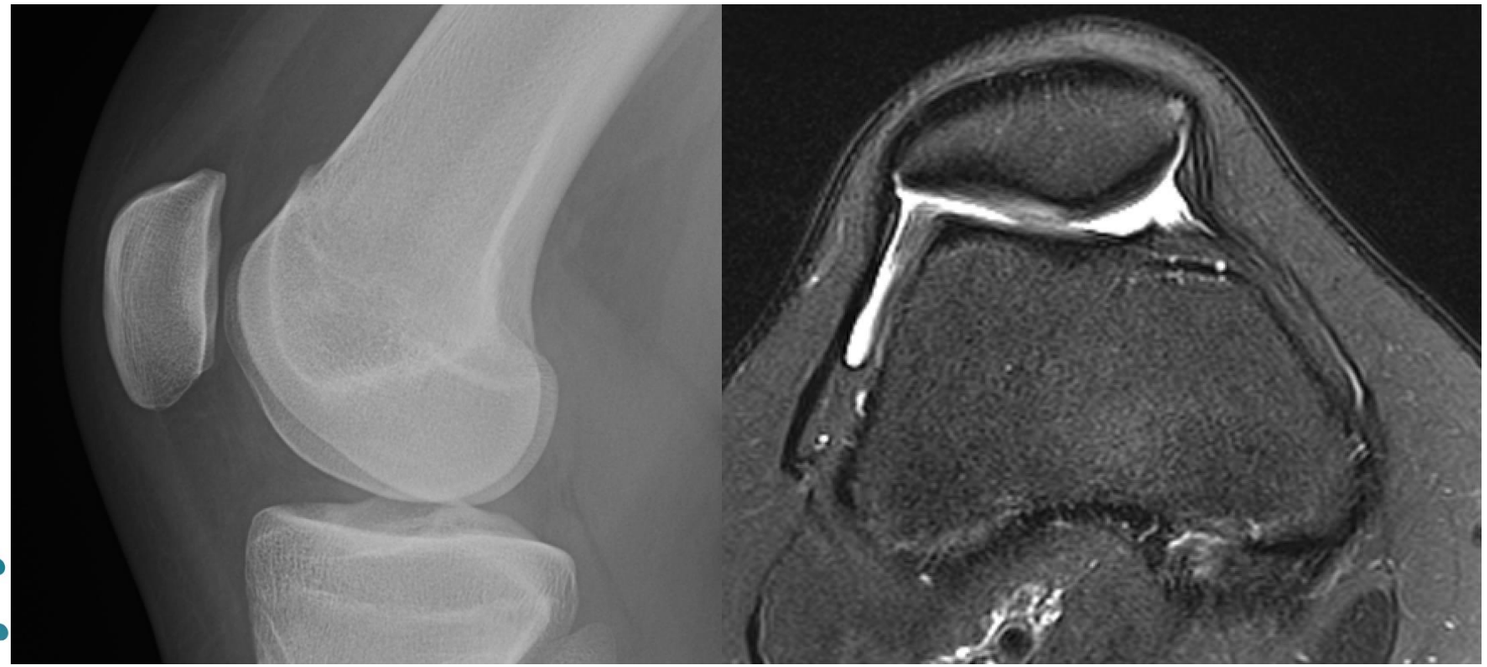
Solution= utilising a quantitative measurement to quantify the trochlear shape this would likely **improve the sensitivity of diagnosing low grade trochlear dysplasia.**

Discussion

Excellent sensitivity and specificity to detect high-grade trochlear dysplasia when using the simplified two type classification (type B or D) of 92% and 88% respectively.
Not perfect→ How to improve????

Case example of disagreement- crossing sign with ?small bump-
Is this Dejour V 2 grade A or grade B?

Insights for new classification→ What size spur matters? **New classification needs to measure spur**, and high grade dysplasia needs to be **numerically the highest** to avoid confusion amongst practitioners



Discussion

Insights for new MRI classification

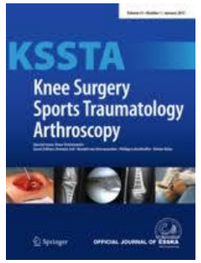
1) Quantify trochlear shape→ improve **sensitivity to diagnose low grade** trochlear dysplasia

2) **Severity of dysplasia must numerically increase**, not B and D high grade, A and C low grade

3) Quantify trochlear spur→ **improved specificity for high grade** trochlear dysplasia

Discussion

Issues identified incorporated into Dejour V3 MRI classification



Adapting the Dejour classification of trochlear dysplasia from qualitative radiograph- and CT-based assessments to quantitative MRI-based measurements

David H. Dejour[1] | Edoardo Giovanetti de Sanctis[1] | Jacobus H. Müller[2] | Etienne Deroche[3] | Tomas Pineda[1] | Amedeo Guarino[1] | Cécile Toanen[4] | Patellofemoral Imaging Group

Type 0 (No trochlear dysplasia)

- sulcus angle <157° **AND** LTI ≥ 14°

Type 1 (Low-grade trochlear dysplasia)

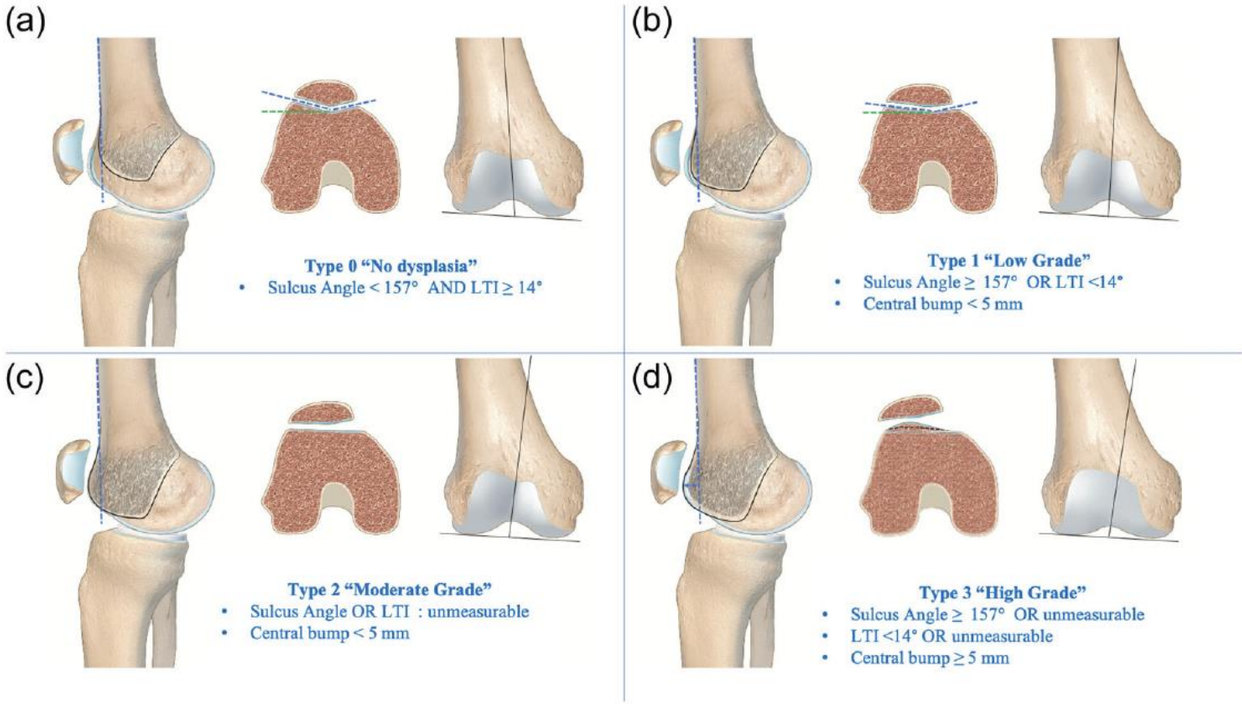
- (sulcus angle ≥157° **OR** LTI < 14°) **AND** central bump <5 mm

Type 2 (Moderate-grade trochlear dysplasia)

- (sulcus angle **OR** LTI 'unmeasurable') **AND** central bump <5 mm

Type 3 (High-grade trochlear dysplasia)

- (sulcus angle ≥157° **OR** 'unmeasurable' **OR** LTI < 14° **OR** 'unmeasurable') **AND** central bump ≥5 mm



Conclusion

We demonstrated excellent intra and inter-rater reliability for the Dejour V2 classification utilising radiographs and MRI when moving from 4 to 2 types of trochlear dysplasia.

Focusing on the presence of the supratrochlear spur therefore should be the focus of any future classifications.

Independent evaluation of the presence of a supratrochlear spur on sagittal slice imaging will help identify high grade trochlear dysplasia and determine which patients will benefit from a trochleoplasty.

Issues identified by us now published as Dejour V3 MRI classification

References

1. Dejour H, Walch G, Neyret P, Adeleine P. Rev Chir Orthop Reparatrice Appar Mot. 1990;76(1):45–54.
2. Dejour H, Walch G, Nove-Josserand L, Guier C. Knee Surg Sports Traumatol Arthrosc. 1994;2(1):19–26.
3. Dejour D, Pineda T, Demey G, ReSurg. Knee Surg Sports Traumatol Arthrosc. 2024 (in press).
4. Dejour D, Saggin P. Int Orthop. 2010;34(2):311–316.
5. Dejour DH, Mesnard G, Giovannetti de Sanctis E. J Exp Orthop. 2021;8(1):109.
6. Fucentese SF, Zingg PO, Schmitt J, et al. Knee Surg Sports Traumatol Arthrosc. 2011;19(10):1655–1661.
7. Lippacher S, Dejour D, Elsharkawi M, et al. Am J Sports Med. 2012;40(4):837–843.
8. Remy F, Chantelot C, Fontaine C, et al. Surg Radiol Anat. 1998;20(4):285–289.
9. Nelitz M, Lippacher S, Reichel H, Dornacher D. Knee Surg Sports Traumatol Arthrosc. 2014;22(1):120–127.
10. Pineda T, ReSurg, Dejour D. Knee Surg Sports Traumatol Arthrosc. 2023;31(12):5707–5720.
11. Paiva M, Blønd L, Hölmich P, et al. Knee Surg Sports Traumatol Arthrosc. 2018;26(3):746–755.
12. Nacey NC, Fox MG, Luce BN, et al. AJR Am J Roentgenol. 2020;215(2):458–464.40