

Osgood Schlatter Disease

Growing Pains: Factors influencing assessment and management of Traction Apophysitis

Bixiang (Sean) Cheng

Why Talk About OSD?

- Affects **10-20%** of adolescents^{1,2}
- Develops during growth phases
- Can last up to 2 years in some cases³
- Potential long-term disability into adulthood⁴

1. Sørensen et al. 2021
2. Ciatavi & Dusak 2022
3. Bruzda et al. 2023
4. Holden et al. 2021



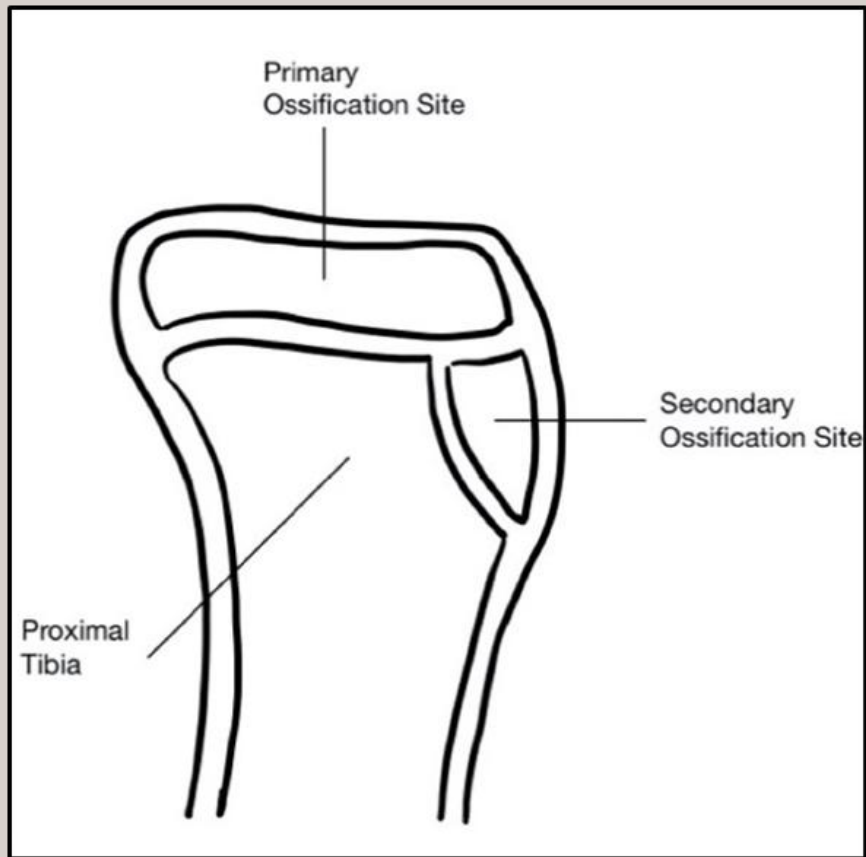
Athletic Implications

- Adolescence is key for athletic development
- OSD impacts sports participation and performance
- May affect long-term career pathways
- Emerging evidence on management



01 What is OSD?

What is OSD?



- Traction Apophysitis of the tibial tuberosity²
- Microtrauma at immature insertion of patellar tendon⁵
- Can involve surrounding structures (patellar tendon, infrapatellar bursa)⁶
- Tibial tuberosity maturation during adolescence

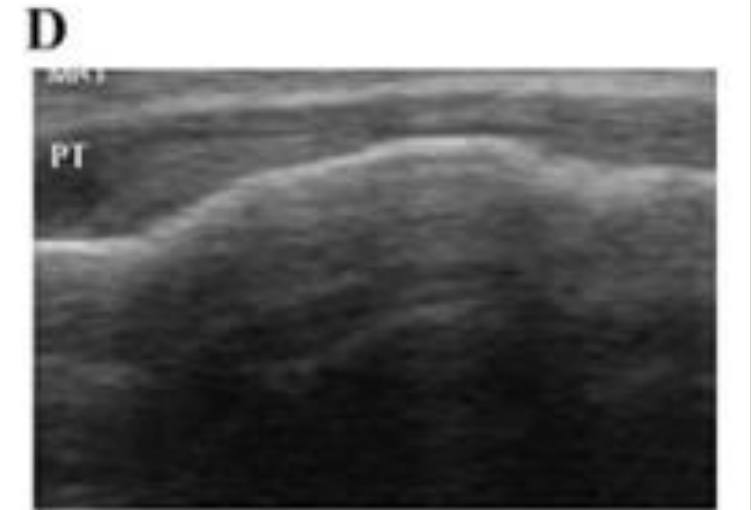
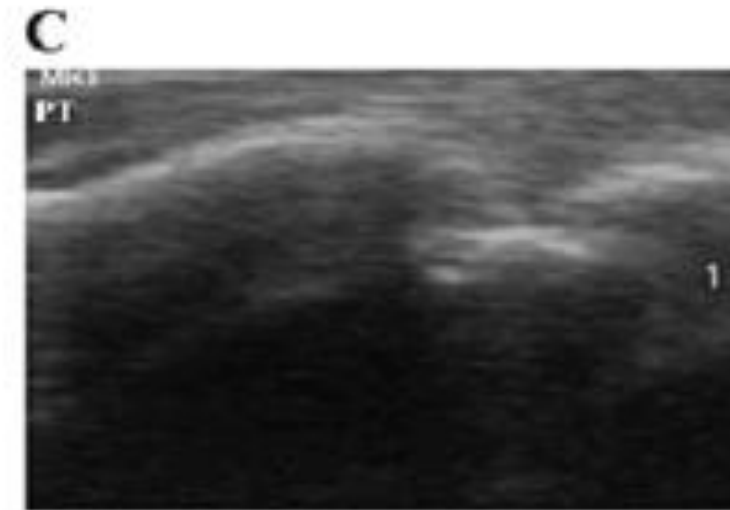
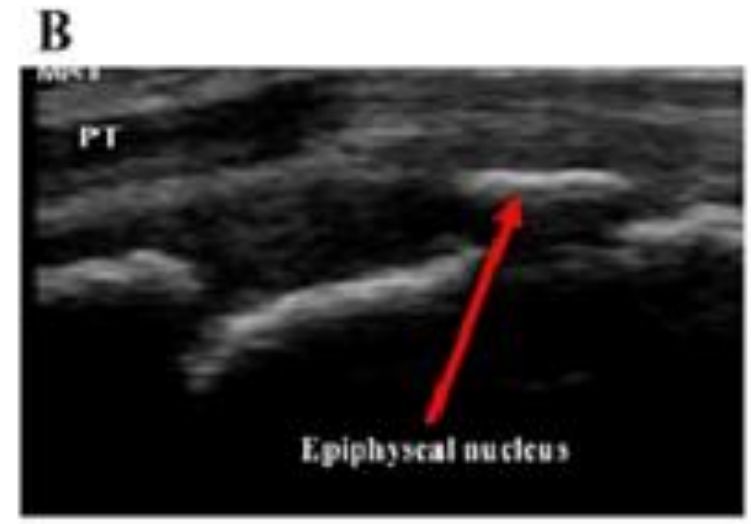
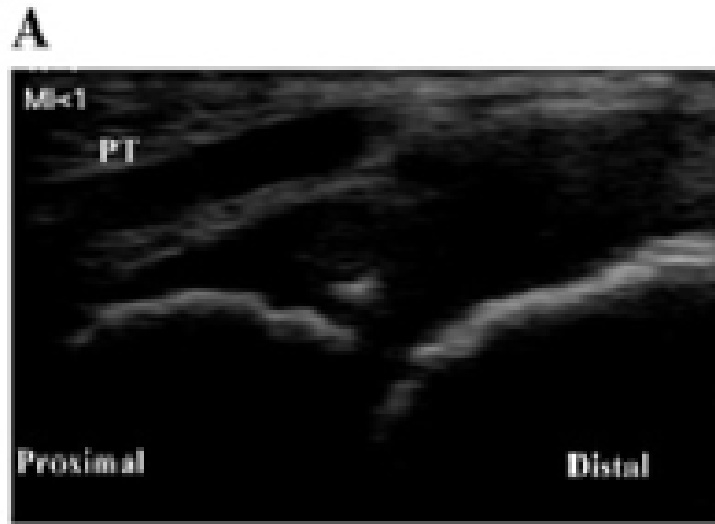
5. Mun & Hennrikus 2021

6. Sørensen et al. 2024

Radiographic Staging

Ehrenborg staging system⁶

- **Most commonly used in research literature**
- A: Cartilaginous Stage
- B: Ossification centres appear
- C: Fusion w/ tibial epiphysis
- D: Closure of epiphyseal line

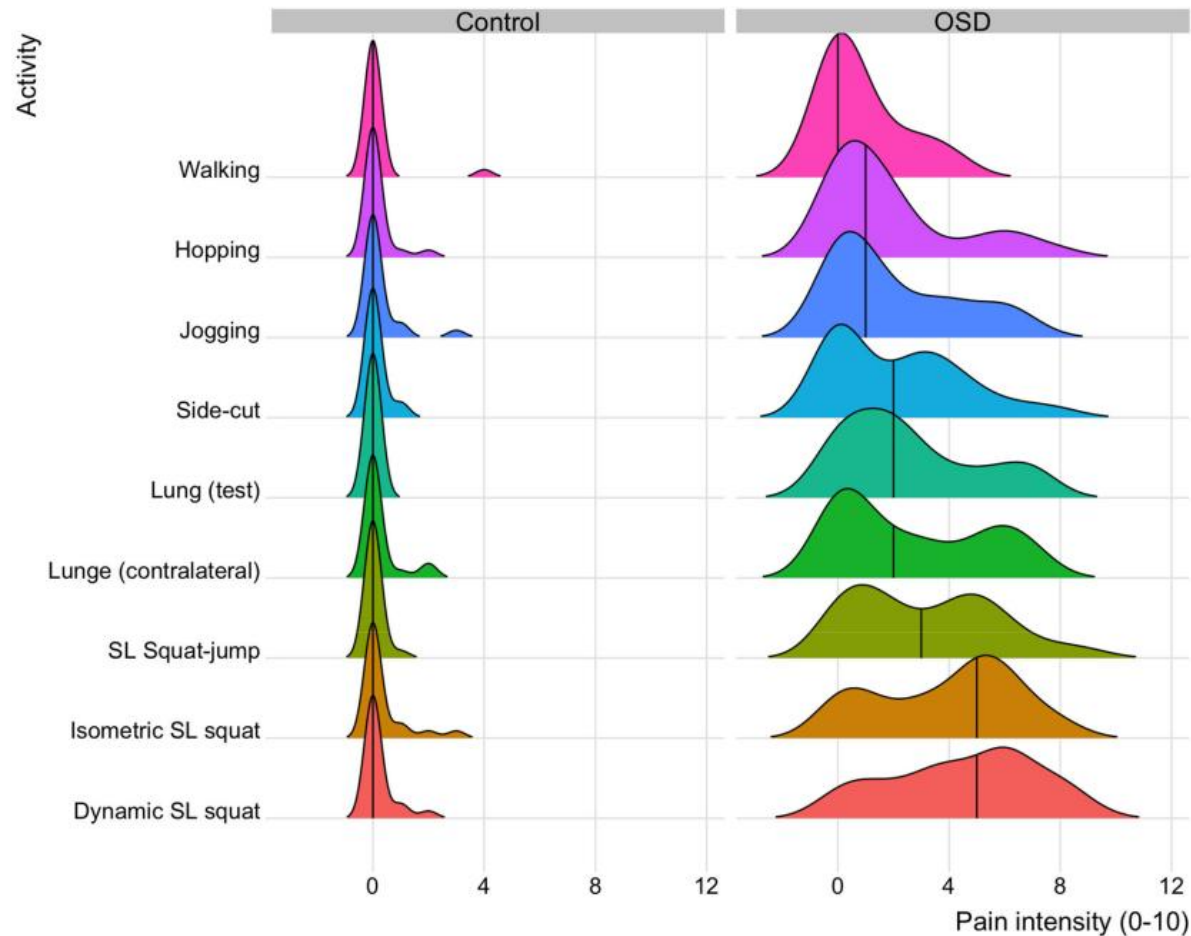


Clinical Presentation

Clinical Diagnosis based on⁷

- **Body chart:** Localised pain at Tibial Tuberosity
- **Behaviour:** Swelling, limping, difficulty squatting/kneeling
- **History:** Atraumatic, gradual onset
- **Social:** Commonly involving running/jumping sports





Physical Assessment

Observation: Swelling, antalgic gait

Functional: Painful SL squat (isometric & dynamic)

RSC: Pain with resisted knee extension

Palpation: Tenderness and swelling at tibial tuberosity⁷

Differential Diagnosis – Atraumatic Knee Pain

Consider the SMILE Tool (Guldhammer et al. 2021)



Patellar Tendinopathy⁸

- Can be concurrent
- Pain ↓ with isometrics



Sinding-Larsen-Johansson⁸

- Apophysitis of patellar inferior pole
- Similar presentation, different location



Patellofemoral Pain⁸

- Diffuse anterior knee pain
- Non-specific diagnosis of exclusion



Osteochondritis Dissecans⁹

- Joint effusion, vague pain, catching/locking
- **Refer for imaging if suspected**

Role of Imaging?

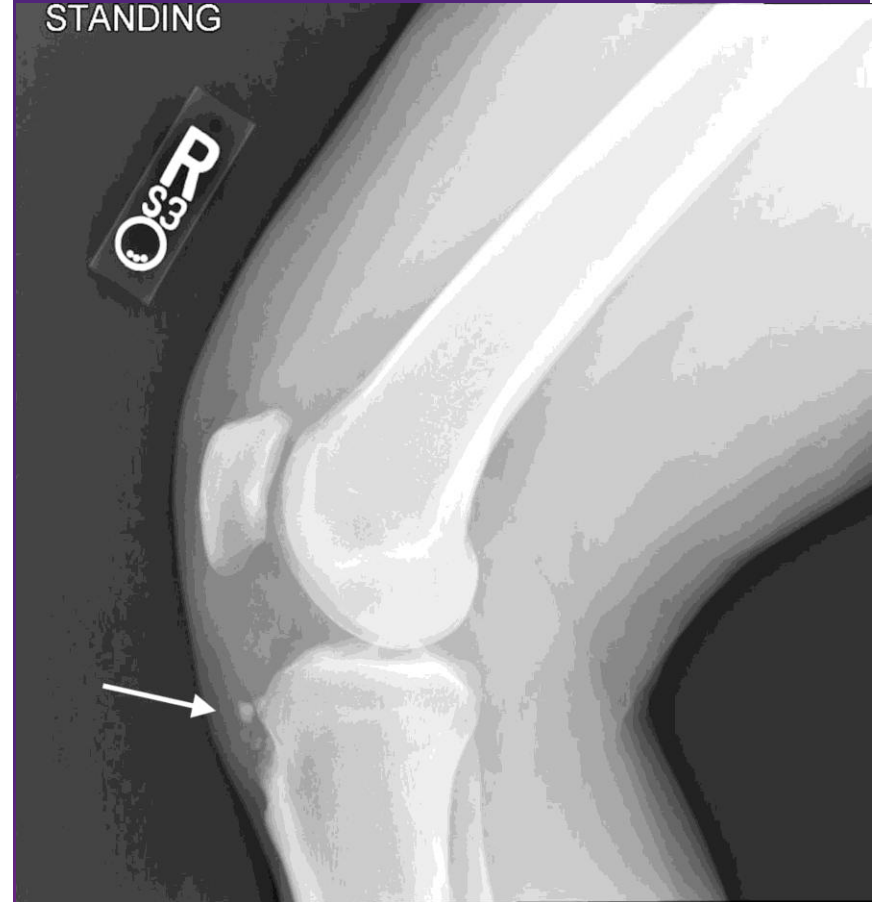
Common findings:

- Patellar tendon thickening¹⁰
- Fragmentation & Ossicle formation^{1,2}
- Not specific to OSD

Utility:

- Chronic/persistent pain into adulthood²
- Hx of Trauma²
- Guide for surgical decision⁵

STANDING



Separated ossicle in skeletally mature adult with Hx of OSD
<https://casereports.bmj.com/content/bmjcr/12/3/e228963/F1.large.jpg>

Common Risk Factors

**Sports with high impact
movements^{11,12}**



**Early Sports
Specialisation^{12,13}**



**History of other
apophysitis
e.g. Sever's¹⁰**



Quadriceps Muscle Stiffness

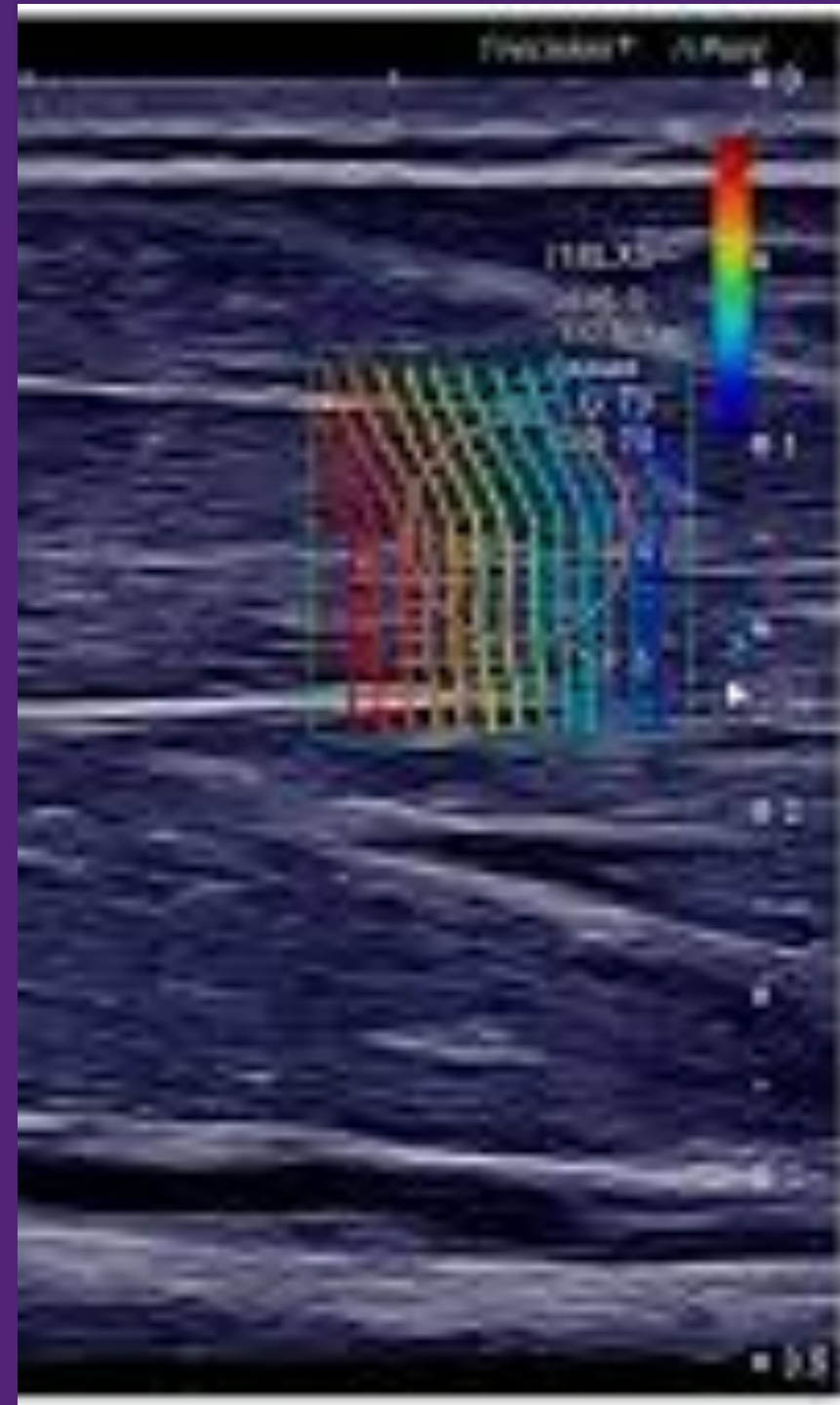
Emerging evidence for risk factor

Enomoto et al (2021): Shear wave elastography

Rectus Femoris tissue stiffness – Performance adaptation

Inappropriate for immature skeleton

Future direction for research, intervention?



Other Factors

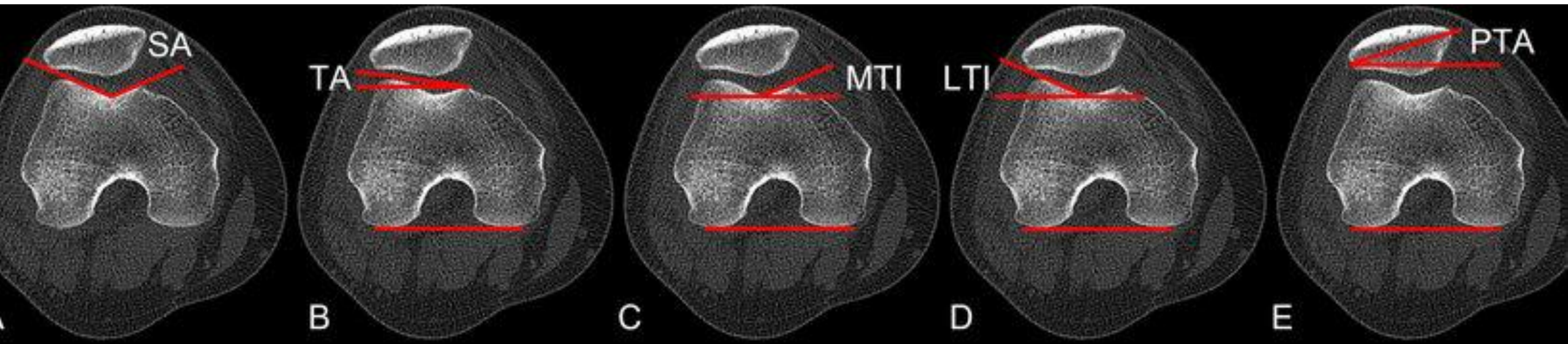
Changing thoughts

- Patellar/Patellofemoral morphology – inconclusive^{6,15}
- BMI – weak correlation¹⁶

Emerging findings

- Tibial morphology: posterior tibial slope¹⁶
- Patellar tendon insertion: Area of attachment and proximity^{6,16}

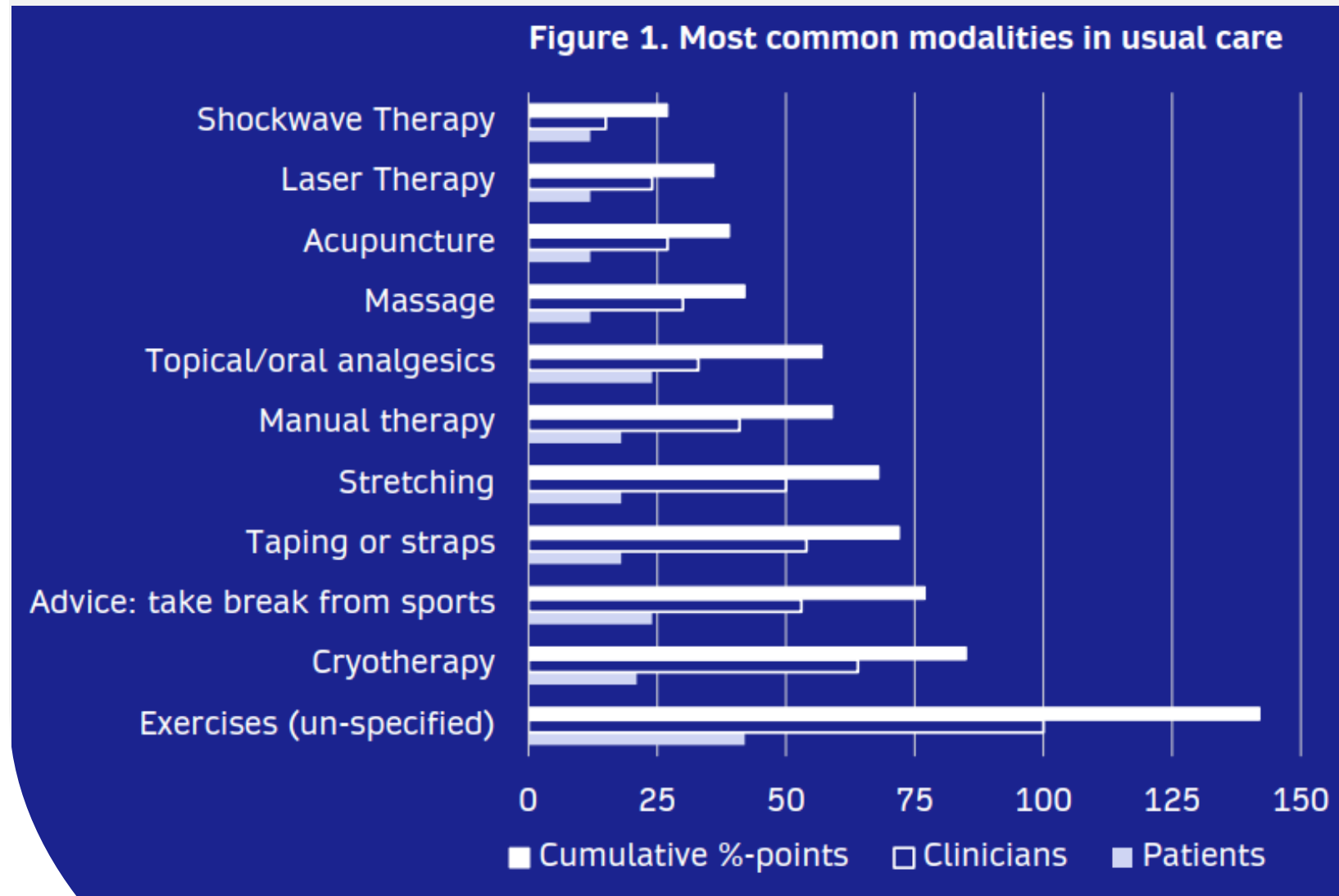
15. Kamel et al. 2021
16. Lucenti et al. 2022



Management

Usual Care for OSD¹⁷

- Exercise
- Cryotherapy
- Taping/strapping
- Stretching
- Advice & education
- Physical activity/sports modification



Management Principles & Barriers

- Primary principle: Load management & Pain relief
- Complete rest: Inappropriate, no longer followed¹⁸
- Most clinicians agree on the need for exercise intervention^{17,19}
- **No consensus on best practice¹⁸**
 - No guidelines for exercise dosage, self-management or adjunct therapies.

18. Neuhaus et al. 2021

19. Kabiri et al. 2014



Activity Modification & Knee Strengthening

Rathleff et al 2020

Block 1: 0-4 weeks

- Glute Bridge
- Isometric Knee Extension



Block 2: 5-12 weeks

- Wall squat – bodyweight squat
- Progress to lunge



- Activity Ladder
- Pain <3/10
- Education: Pathology & Management

At 12 Months:

- 90% successful outcome
- 69% returned to sports

SOGOOD Trial

Krommes et al. 2024

- Based on Rathleff et al. 2020
 - Addition of dynamic balance and alignment exercises
- Exercise vs usual care
- Self-management central component
- 130 participants



What's Next?

Gaps in our knowledge

- Need for consistent exercise protocols
- High heterogeneity in intervention studies
- Lack of clinical guidelines
- Effectiveness/Risks of adjunct treatments:
e.g. manual therapy, patellar tendon straps,
injection
- Why do some patients not achieve good
outcomes?



Thank you

Bixiang (Sean) Cheng
Bphty, Mphty (Musc) Student
bixiang.cheng@student.uq.edu.au

[linkedin.com/in/sean-c-70532593](https://www.linkedin.com/in/sean-c-70532593)

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