

PRPP Injection '2023'

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29-31 Dora Street, Hurstville



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PRPP 2023

- This talk was last delivered in 2016
- What has changed?
- What has stayed the same?
- What are my experiences (N=1) in the last 10 years



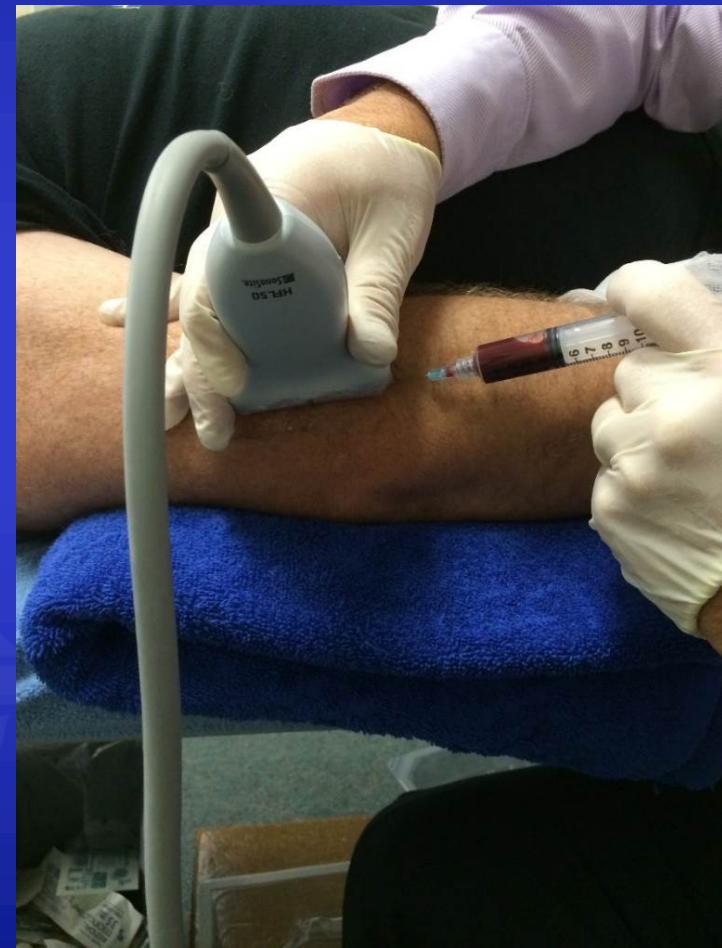
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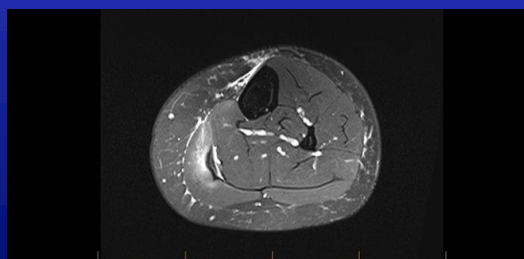
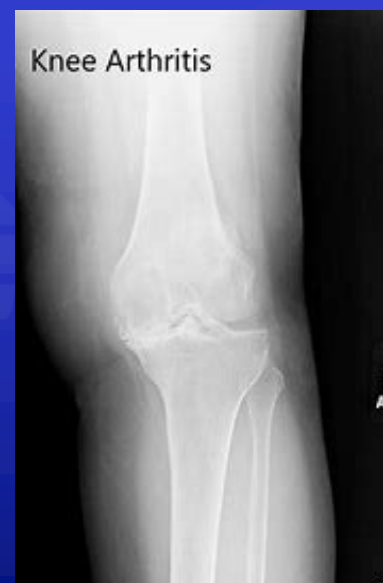
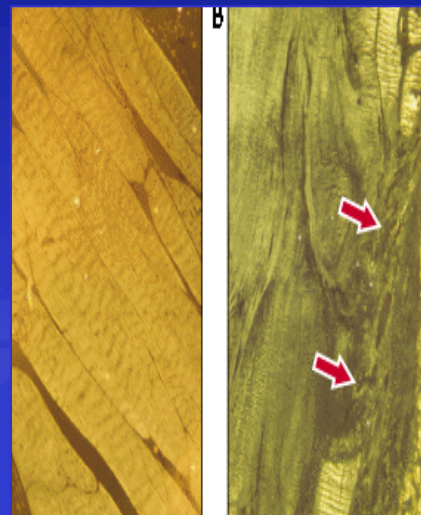
PRP injection - Outline

- Basic science
- PRPP preparations
- Literature
- Outcome measures
- Patient information



Conditions Treated

- Tendinopathy
 - Breakdown of collagen architecture
 - Prolonged healing time
- Osteoarthritis
 - Loss of articular cartilage
 - Progressive disease
- Muscle injury

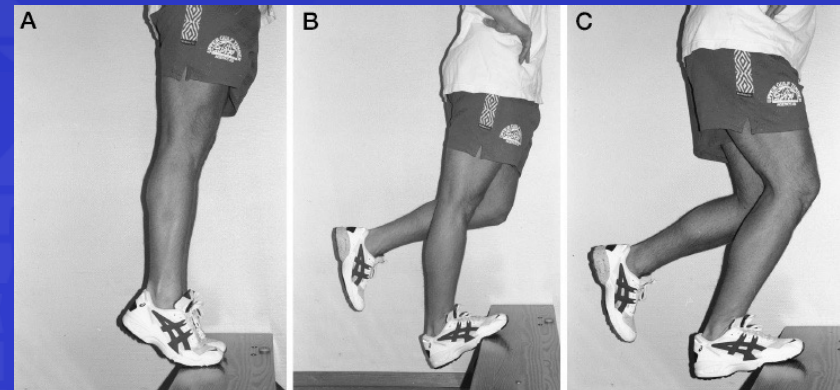


Historical Perspective

- Standard conservative management
- Rest, ice, unload
- Medications – NSAID's
- Physio + exercise/rehabilitation
- Cortisone injection (+others)

- Surgery
- Tendinopathy – not always helpful
- Joint – Arthroplasty

- Is there another way we can treat?



Historical Perspective

- The role of biological therapy
- Edwards 2003. JHS
- Tennis Elbow failed standard non-operative Rx
- 22/28 (78%) improved with whole blood injection
- The Goldberg effect!
- Could we do this better?



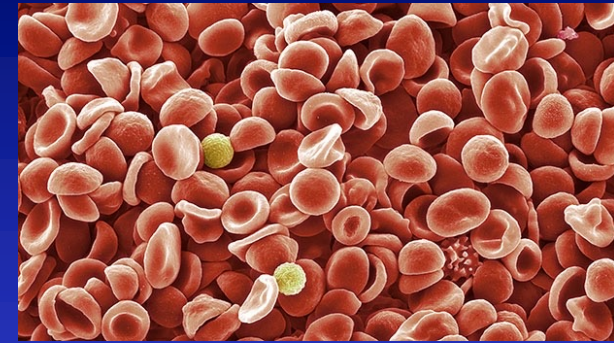
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What is PRPP?



- A volume of plasma that has a platelet count above baseline (Can be 3-5X depending on preparation method)
- First used 1987 in open heart surgery, now widely used in many fields of medicine (orthopaedics, cosmetic surgery, wound care, ophthalmology)
- Removes the parts of the blood we don't need (RBC's/Excess plasma), whilst concentrating the part we want (platelet/leukocytes)



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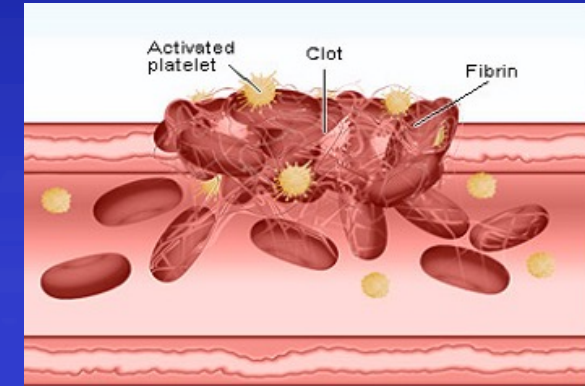
How Does PRPP work?

- Tissue healing regulated by complex processes using growth factors and cytokines
- Platelets are a rich source of bioactive molecules
- 1100 different proteins
- The exogenous introduction of growth factors may enhance tissue healing in compromised situations



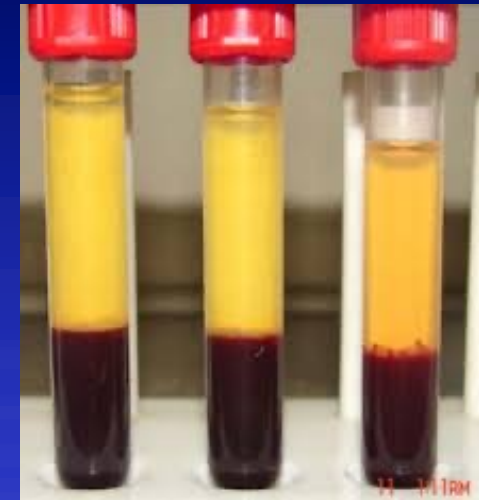
How Does PRPP work?

- Alpha Granules
 - TGF-B - cell replication
 - VEGF – angiogenesis
 - PDGF – tissue re-modelling
 - EGF – cell migration & replication
- Acute inflammation leading to collagen deposition and enhanced tissue repair



PRP Preparation

- Multiple methods proposed
- Simple spin preparations
- Commercial kits
- Maximise platelet counts!



PRP Preparation

- The role of Leukocytes ‘The Buffy Coat’

The Effectiveness of Platelet-Rich Plasma in the Treatment of Tendinopathy

A Meta-analysis of Randomized Controlled Clinical Trials

Jane Fitzpatrick,^{*†} MBBS, FACSP, Max Bulsara,[‡] BSc(Hons), MSc, PhD,
and Ming H. Zheng,[†] MD, PhD, FRCPath, FRCPA

Investigation performed at the University of Western Australia, Perth, Australia

- Studies suggest leukocyte rich preparations are more beneficial in tendon injury

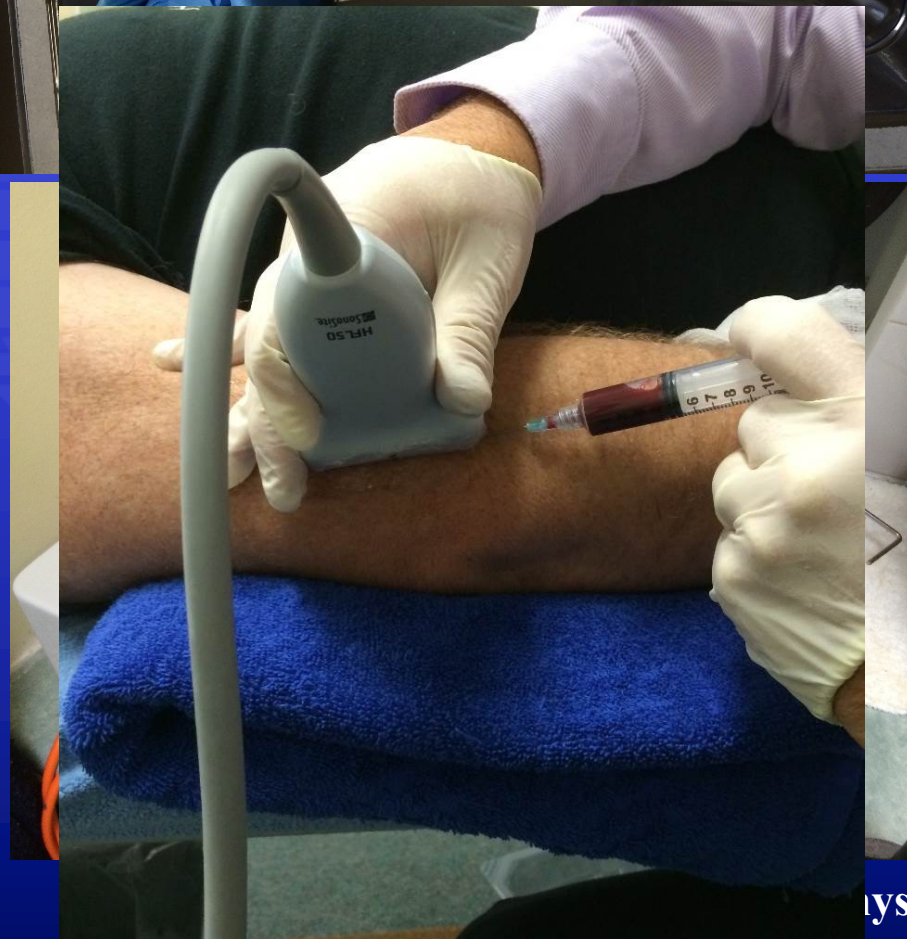
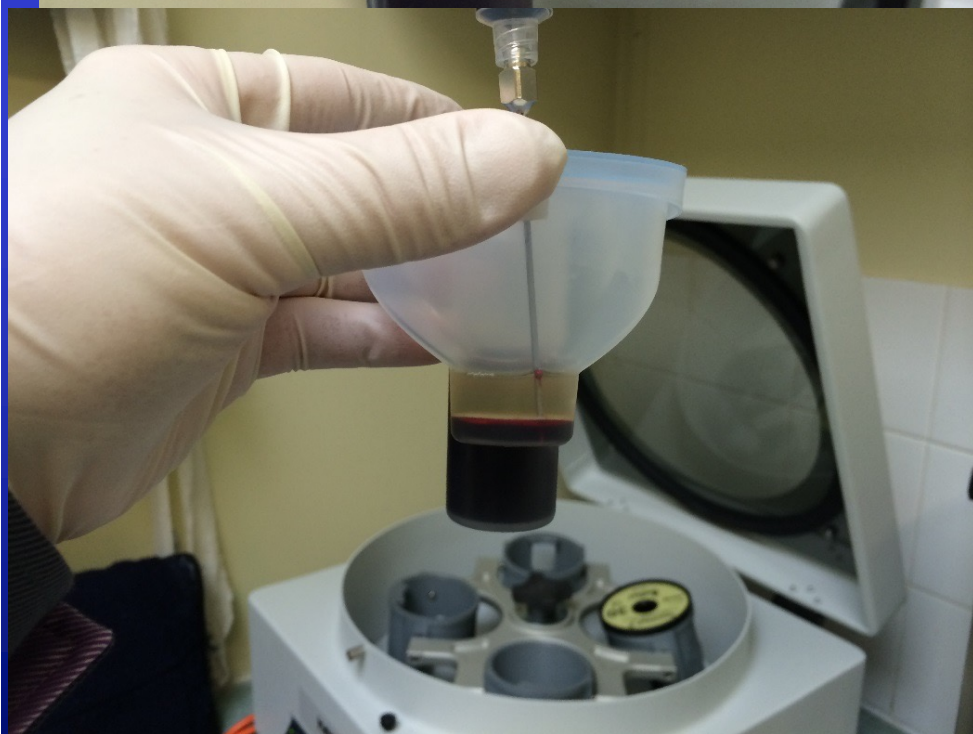
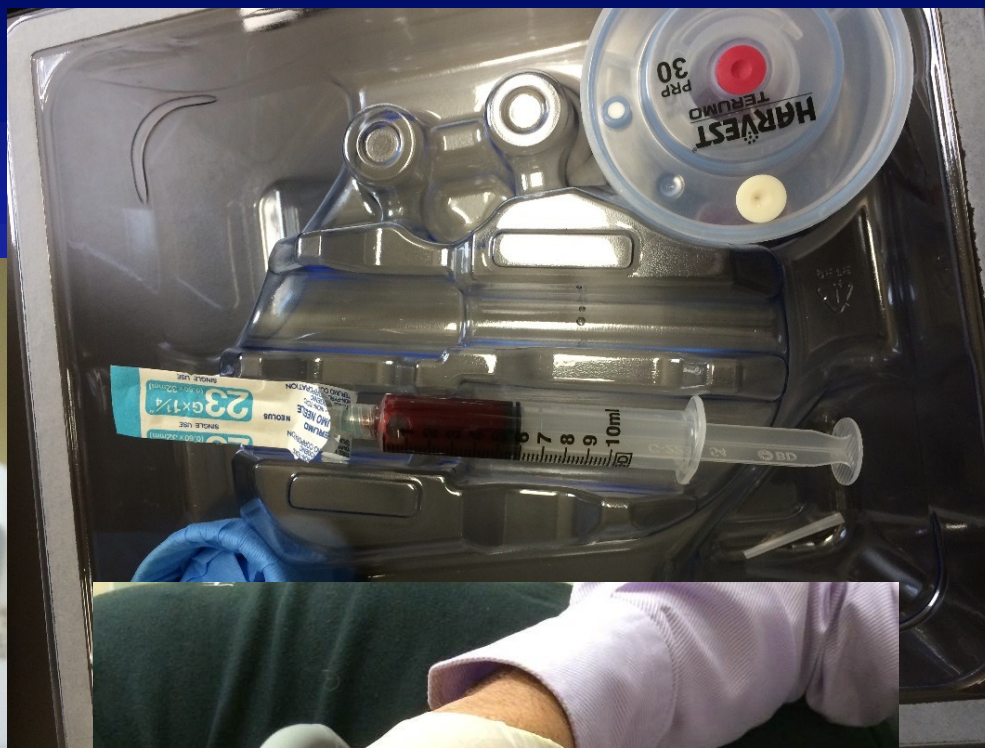


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PRP - Preparation



Evidence for PRPP

- Many studies
- Not all high quality
- Sometimes conflicting
- Sufficient evidence to support its use (including level one evidence in lateral epicondylitis/gluteal tendonopathy)



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Evidence for PRP - Tendon

Positive Effect of an Autologous Platelet Concentrate in Lateral Epicondylitis in a Double-Blind Randomized Controlled Trial

Platelet-Rich Plasma Versus Corticosteroid Injection With a 1-Year Follow-up

Joost C. Peerbooms,* MD, Jordi Sluimer,[†] MD, Daniël J. Bruijn,* PhD, and Taco Gosens,^{†‡} PhD
*From the *Department of Orthopaedic Surgery, Haga Hospital, The Hague, Netherlands, and
[†]Department of Orthopaedic Surgery, St Elisabeth Hospital, Tilburg, Netherlands*



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Tennis Elbow

- VAS scores at 12 months
- (>25% improvement)
- CSI – 49% (24/49) improved Vs PRP 73% (37/51) improved
- CSI better initially, PRP improved longer term
- PRP exceeded CSI even at 2 year follow-up

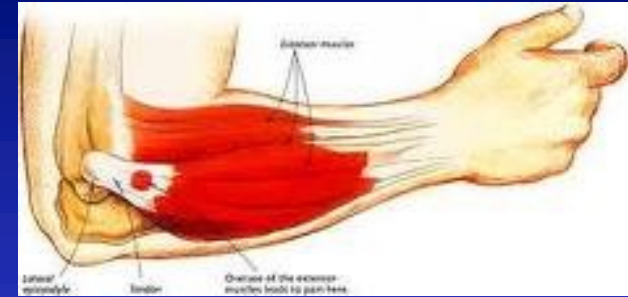


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Tennis Elbow



- Mishra AmJSM 2014
- 230 patients with tennis elbow, failed 3/12 of conservative therapy
- At 24 weeks 71% of LR-PRP improved vs 56% of control (Dry needle, no PRP)
- Residual tenderness 29% PRP vs 54% in control



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Tennis Elbow

- Ben-Nafa & Munro, SICOT 2018
- Meta-analysis
- 4 studies L1, 1 L 2 evidence.
- CSI have rapid therapeutic effects with relapse of symptoms
- PRP produces slower, but long-term effects
- Better tendon morphology in PRP



Plantar Fasciitis



- Monto, F&A Int 2014
- PRP better than CSI for recalcitrant plantar fasciitis @ 3,12 and 24 months
- Mahindra, Orthopaedics 2016
- PRP/CSI more beneficial than NS injection



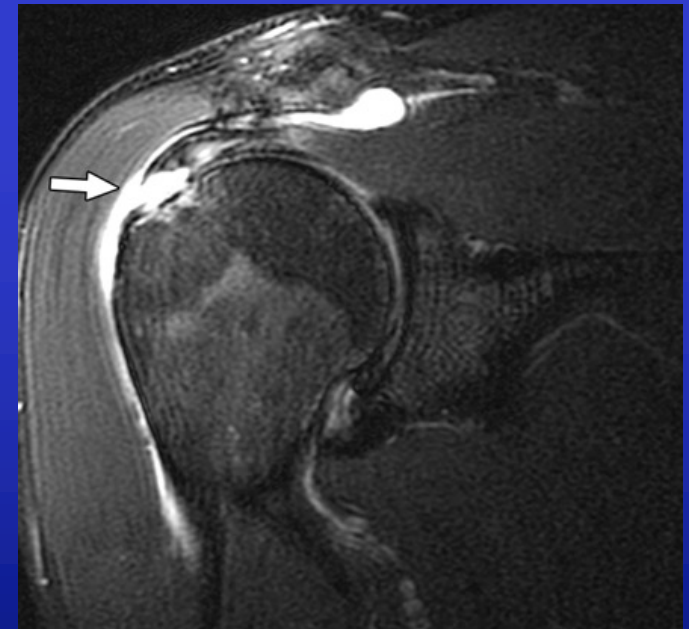
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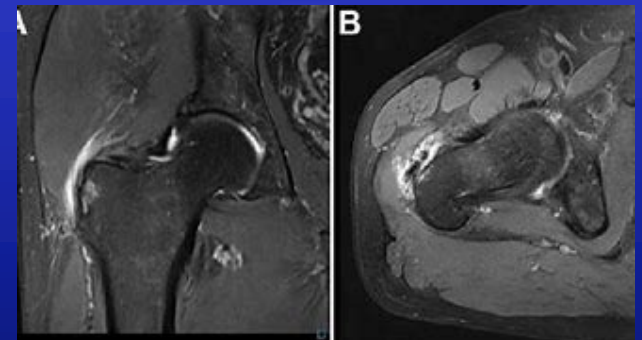
Rotator Cuff

- Shams Eur JOST 2014
- RCT PRP vs CSI
- Improvement in both groups at 12/52.
- PRP better than CSI



Gluteal Tendinopathy

- Fitzpatrick et al Am JSM 2017
- Double blind randomised control study of single PRP vs cortisone injection
- 80 subjects
- 82% improvement in PRP vs 56% improvement in CSI at 12/52



Gluteal Tendinopathy

- Fitzpatrick AmJSM 2019
- 2 year follow-up on PRP vs CSI for gluteal tendonopathy.
- 27 patients failed CSI @24 weeks
- Improvement with crossover to PRP group
- LR PRP group maintained 38/39 patients at 52 weeks



Patella Tendon

- Dragoo AmJSM 2014
- 23 patients with refractory patella tendinopathy
- Randomised to LR-PRP vs Dry needling
- 12 week VISA scores much better in PRP group



PRPP and Joint

- Knee OA
- Why does it work?
- Most likely down regulation/modulation of inflammation
- Positive effects on cartilage in vitro
- Does produce chondrocyte proliferation
- No evidence for slowing disease progression



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Evidence for PRP Joint

- Knee joint Osteoarthritis
- Patel 2013. AmJSM
- 156 knees
- 52 PRP, 50 X2 PRP, 46 NS
- Significant improvement in first 2 groups from 2-3/52 to 6/12
- No difference between 1 & 2 PRP injections
- NS deteriorated



PRPP and Joint

- Laver, Cartilage 2016
- Literature review
- PRP shows improved symptoms compared to baseline/controls
- Better in younger patients/Early OA
- Most PRP v HA studies showed better improvement in PRP (9/11)



PRP - Downsides

- A generally safe procedure
- Post injection pain
- Almost everyone. Lasts from days to weeks
- Not universally successful
- Approx. 75% for tendonopathy



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My Experience – 2016

‘The plural of anecdote is not data’

- 348 treatments over 4 years
- 64% overall improvement (includes hip/shoulder OA)
- Mean improvement 79 on VAS
- 14 % had 100% improvement
- 73% workcover (84)

Thanks to Dr John Molloy



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My Experience - 2016

- Tennis elbow – 79 cases. 83% imp (85)
- Golfers elbow – 14 cases. 71% imp (93)
- Gluteal tendon – 58 cases. 60% imp (78)
- Hamstring origin – 19 cases. 58% imp (84)
- Plantar Fasciitis – 24 cases. 63% imp (86)
- Achilles – 39 cases. 67% imp (81)
- Knee OA – 18 cases. 56% imp (62)



My Experience 2023 - Tendon

- 1579 patients over 10 years (tendon & joint)
- Tennis elbow : 286 cases. 76% (VAS >50%)
- Gluteal tendonopathy : 173 cases. 83%
- Achilles (MS) : 104 cases. 73%
- Plantar fasciitis : 91 cases. 65%
- Proximal hamstring. 77 cases. 70%
- Golfers elbow : 56 cases. 78%
- Patella tendon. 32 cases. 80%



My Experience 2023 - Tendon

- Biceps Tendon (Elbow). 15 cases. 73%
- Tib post. 20 cases. 70%
- Tib Ant. 10 cases. 70%
- Peroneal tendon. 9 cases. 77%
- Triceps tendon. 9 cases. 77%

- The Negrine Effect!



My Experience 2023 - Joint

- Knee OA. 124 Cases. 69%
- GH OA 36 cases. 65%
- Hip Joint. 17 cases. 60%
- Ankle OA 8 cases. 75%



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My Experience – Tennis elbow

- 52 M
- Very average tennis player
- 9 months of symptoms with ‘watch and wait’
- Moderate post injection pain
- 3 months to recovery
- Outcome measure - pain free backhand!



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Case Study - Mr CP

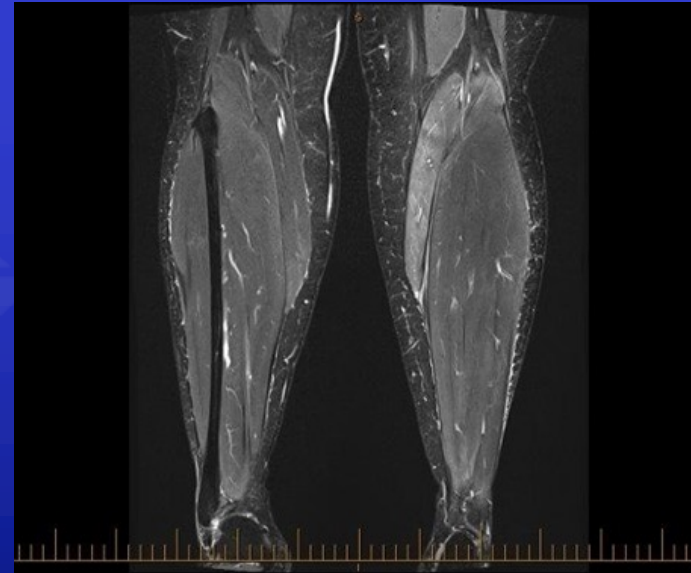
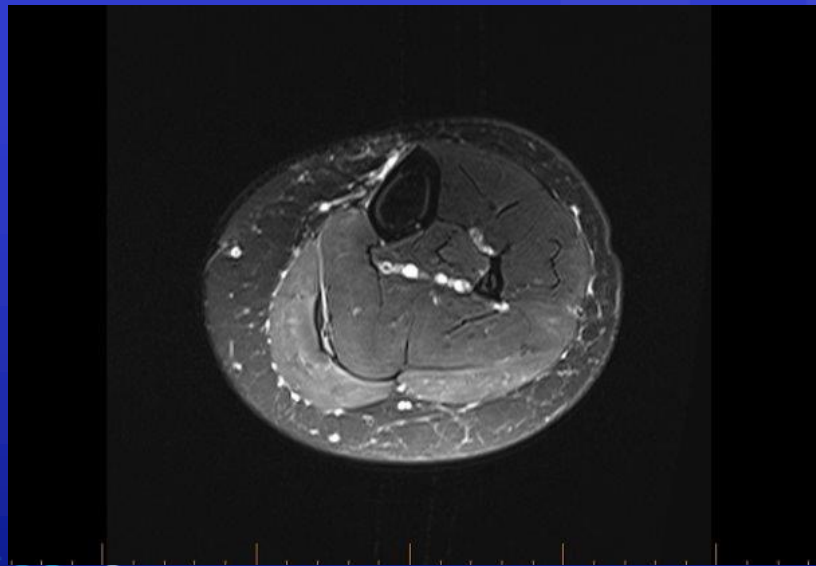
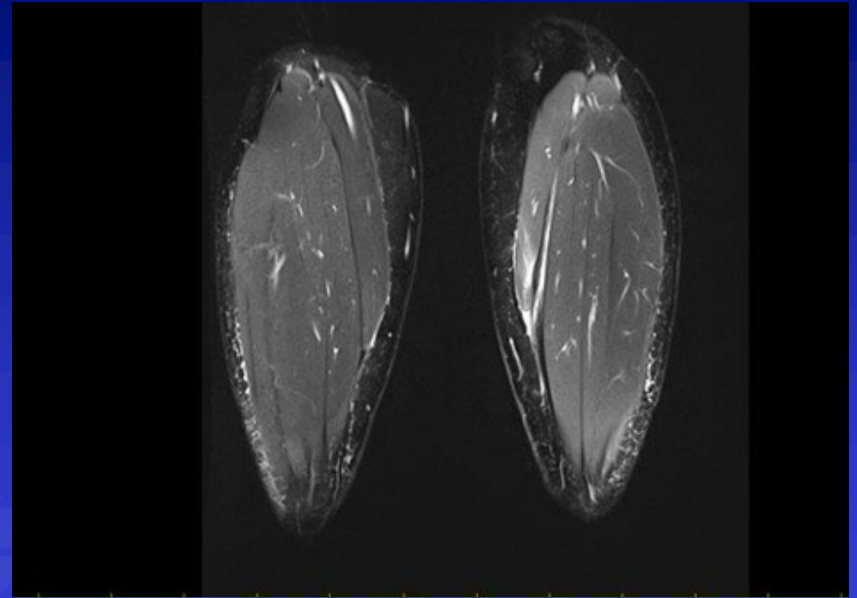
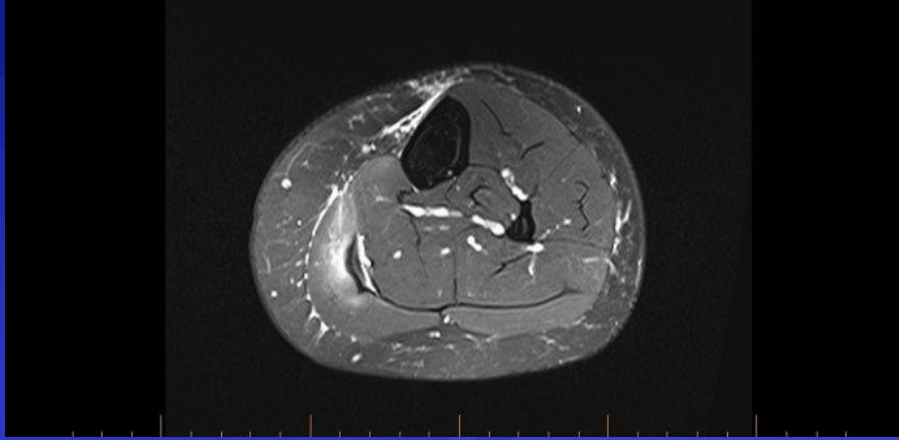
- 31M. ACL's age 16
- Significant tri-compartmental OA
- Previous scopes/HTO
- Daily symptoms. Issues with work/training
- R/V July 2020. BMI 36. Bilateral knee effusions/F1 100 degrees
- Bilateral IA PRP injections
- Substantial improvement in pain & function
- Has now had 5 injections, typically every 12 months



Case Study – Mrs TG

- 32F. Baseballer
- Acute MHG strain running to base
- Presented 5/12 post injury with ongoing pain/dysfunction despite excellent physio/rehab
- MRI prior to presentation MHG tear with central tendon component





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Case Study – Mrs TG

- Outcome
- Course of 2 PRP injections
- USG to central tendon region
- 50% improvement 6/52 post 1st injection
- Post 2nd injection mostly pain free with improved strength/function
- Graded return to baseball



Take Home Message

- PRP is a biologic treatment that offers an alternative to our standard management options.
- PRP has a good theoretical basis for treating chronic tendinopathy + osteoarthritis
- Whilst the literature is at times conflicting, there is sufficient evidence to support its use
- Post injection pain is the main side-effect



Thank You

