

SO YOUR PATIENT WANTS A BLOOD INJECTION

Jimmy D Bowen MD, FAAPMR, CAQSM, CSCS, RMSK

Platelets

- Biological markers of inflammation
 - With acute injury platelets and the coagulation pathways are activated.
 - Platelets have more function than to stop bleeding, they are the EMS system sending out messages to come and fix this problem.



Phases of Healing

- Platelet activation leads to three stages of healing.
 1. Inflammation
 2. Proliferation
 3. Remodeling
- When one of these stages is blocked or not completed, tissue homeostasis is lost causing pain and loss of function.

Inflammatory Phase

During the inflammatory phase activation of platelets:

- Anti-microbial
- Adhesion
- Aggregation
- Clot retraction
- Pro-coagulation
- Cytokine signaling
- Chemokine release
- Growth factors



Proliferation Phase

Initial inflammatory phase last 2-3 days.

- Proliferation usually begins from day 5-15.
- Fibroblasts enter the site and begin proliferation phase
- Low pH and oxygen levels stimulate fibroblast proliferation at the injury site.
- Fibroblasts become the most abundant cell by the seventh day.
- Fibroblasts are responsible for deposition of collagen.
- Neovessels begin to form at 5-7 days.

Remodeling Phase

- Collagen matures and strengthens.
- Tissue repair starts when production and break down of collagen equalizes.
- This process can take up to 6 – 12 months.
- Type III collagen is replaced by type I collagen.
- Reorganization occurs.
- Neovessels disappear

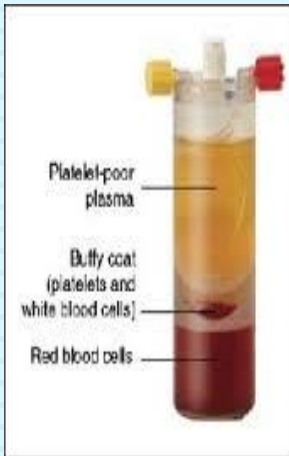


Questions

What is
Prolotherapy?

What is PRP?

Difference from
autologous blood?



*“The art of medicine consists of
amusing the patient while nature
cures the disease”*

Voltaire

Case 1

- 33 y/o male tennis player with chronic lateral epicondylitis
- Failed PT and steroid injection
- Wants PRP



Case 1

- Does that really work doc?
- Comparative effectiveness of injection therapies in lateral epicondylitis: a systematic review and network meta-analysis of randomized controlled trails
- Doc, I heard there are different kinds.
- Does it matter which you use?

Different kinds of PRP?

- ▣ Leukocyte rich
- ▣ Leukocyte poor
- ▣ Different concentrations of platelets depending on system used



What does the evidence show?

- Platelet-rich therapies for musculoskeletal soft tissue injuries.
- Insufficient evidence
- Biased trials
- There is need for standardization of PRP preparation methods

Moraes VY, et al. Cochrane Database Syst Rev. 2013 Dec 23; doi: 10.1002/14651858.CD010071 .pub2.

What does the evidence show?

The inflammatory effect of Leukocyte-poor versus Leukocyte-rich Platelet-Rich Plasma

Dragoo et al. Poster 1329, ORS 2013 Annual meeting

- ❑ 5 days more inflammation with rich
- ❑ Healing ?????



Which patients get PRP?

- How do you determine who qualifies?

- Any caveats first?

- How long to wait after a prior steroid injection?

- How long to avoid NSAIDs?

 - ▣ Prior ?

 - ▣ After?

What are the risks of PRP?



How do you do the injection?

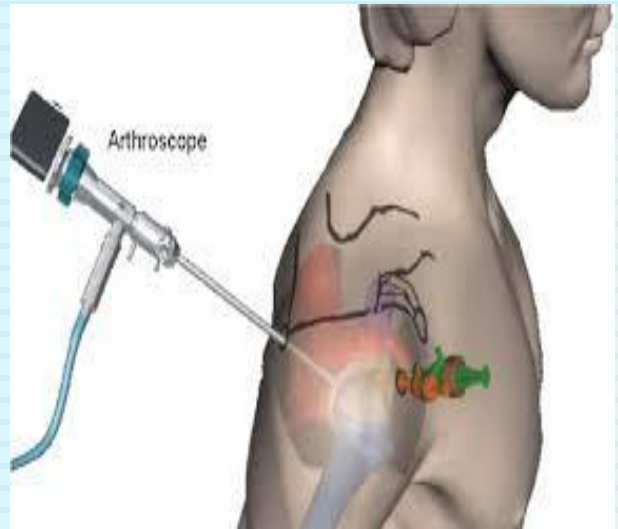
□ Local ???

□ What size
needle ???



Case 2

- 48 y/o male with acute rotator cuff tear
- Referred for surgery
- Doc, should I ask my surgeon to inject platelets into the repair?



What does the evidence show?

- Does not offer benefit compared to surgery alone.
 - ▣ May benefit @ bone-tendon interface
 - ▣ May benefit if > 3 cm tears

Clinical and structural outcomes after arthroscopic repair of full-thickness rotator cuff tears with and without platelet-rich product supplementation: a meta-analysis and meta-regression. *Arthroscopy* 2015; 31(2):306-20.

Case 3

- College pitcher – Grade 2 UCL tear
- Doc – can you inject it?

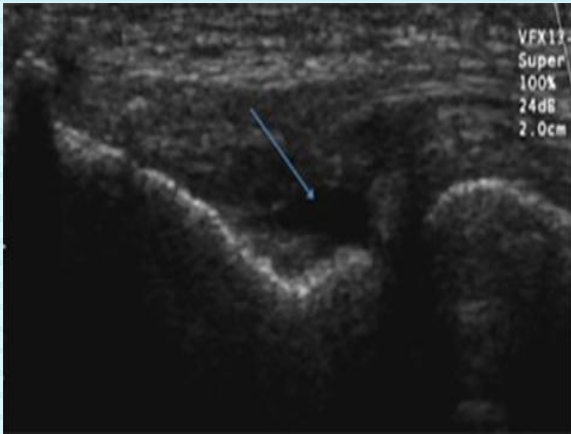


What does the evidence show?

- No controlled trials
- Case series – showed 30/34 RTP at same level
- 1/34 require surgery

Am J Sports Med 2013; 41(7): 1689-94.

Case 3



- They failed conservative therapy
- Unable RTP
- PRP vs surgery

<http://www.appliedradiology.com/articles/diagnostic-ultrasound-of-the-elbow>

Case 4

- ❑ Football player with chondral lesions of the knee
- ❑ Doc, will a blood injection help?



Evidence?

- Treatment of osteochondral injuries with platelet gel
- Good results vs no Rx
- Rabbits

Clinics (Sao Paulo) 2014;
69(10):964-8.



PRP Polymer Implants

- Favorable outcomes (5 yr)
- Not athletes
- Middle-aged patients



Open Orthop J 2014;8:346-54.

Case 5

- 60 y/o with knee OA
- Has had corticosteroid
- Has had HA
- What about platelets?

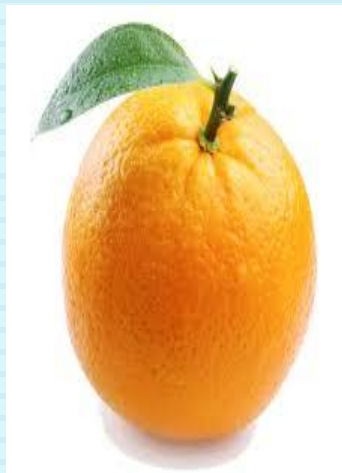


Knee Osteoarthritis

- ❑ Sanchez et al. 2008 case/cont
 - Knee OA, PRGF vs hyaluronan
- ❑ Kon 2010 and Filardo 2011, series
- ❑ Sampson et al 2010 series
- ❑ Wang-Saegusa et al 2011 series
- ❑ Filardo et al 2011 series
- ❑ Gobbi et al 2012 series
- ❑ Kon/Mandelbaum et al. 2011 PRP vs Visco
- ❑ Spakova et al 2012 PRP vs Visco
- ❑ Patel et al 2013 PRP vs placebo



But



More Questions than Answers

- Autologous
Blood vs PRP

- Consider

- Leukocyte rich
vs poor

- What are you
treating

- Dry needling
???

- Prior therapy

- \$\$\$

Call for Research

- Standardized protocols
 - ▣ Type of PRP
 - ▣ Post-therapy
 - ▣ Number of injections
- RCTs