MEDICAL POLICY

PLATELET-RICH PLASMA THERAPY

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POLICY

• Platelet-rich plasma therapy (PRP) involves drawing the patient's blood and spinning it in a centrifuge to separate out the platelets. The layer of platelet-rich plasma is then injected into the patient's pathological body part. The platelets release growth factors to promote healing. It is an office procedure that lasts less than an hour.

• The procedure has gained fame because of use on professional athletes. However, the science is still very limited. As the ODG states, the results are promising, but it is not yet ready for prime time.

• Only in the elbow, is evidence of sufficient quality to support its use.

CRITERIA FOR USE:

1) Medial or lateral epicondylalgia lasting at least 6 months

2) Unresponsive or insufficiently responsive to other treatments including NSAID(s), straps, stretching and strengthening exercises, and at least one glucocorticosteroid injection.

SUPPORTING DOCUMENTATION

Ankle

ODG:

Not recommended, with recent higher quality evidence showing this treatment to be no better than placebo. The first high quality study (an RCT in JAMA) concluded that injections of platelet-rich plasma (PRP) for chronic Achilles tendon disorder, or tendinopathy (also known as tendinitis), does not appear to reduce pain or increase activity more than placebo. Making a prediction based on previous studies, the
authors hypothesized that the VISA-A (Victorian Institute of Sports Assessment-Achilles) score of the PRP group would be higher than that of the placebo group, but their findings proved otherwise. Results after 24 weeks showed that for the PRP group, the mean VISA-A score improved by 21.7 points, and the placebo group's score increased by 20.5 points, with no significant distinction between the 2 groups during any measurement period. Plus, no differences were seen in secondary outcome measures, including subjective patient satisfaction and the number of patients returning to activity. Both treatment groups showed clinical progression in this study and also in other studies on PRP, maybe due to the fact that exercises were performed in each group, and exercises have been shown to be effective, but conservative treatment is disappointing and 25% to 45% of patients eventually require surgery. (de Vos, 2010) PRP looks promising, but it is not yet ready for prime time. PRP has become popular among professional athletes because it promises to enhance performance, but there is no science behind it yet. In a prospective cohort study 30 patients with chronic refractory Achilles tendonosis were treated with PRP, and the authors concluded that PRP should be reserved for the worst of the worst patients with refractory Achilles tendonosis. (AAOS, 2010) This systematic review concluded that PRP injections for Achilles tendinopathy does not improve health outcomes. Overuse injuries of the Achilles tendon are common, particularly among runners, and many injuries can be managed conservatively, but recovery is often slow and prolonged. The limited blood supply to the tendon may contribute to slow or stalled healing, and the growth factors in PRP are hypothesized to jump-start the healing process. One case report highlighted the rapid recovery of a competitive athlete, and one case series of 14 patients reported dramatic improvements. However, the one high quality, double-blinded, sham-controlled randomized trial found no benefit to PRP injections compared with sham injections. The trial was relatively small, so it may have been underpowered to detect small improvements from PRP injection. There are also alternative approaches to processing and activating PRP. It may be that the approach used in this trial was not effective, but other approaches will be effective. However, based on the current evidence, PRP injection does not appear to be an effective approach to the treatment of Achilles tendinopathy. (Tice, 2010) This small low quality case series suggested that treating chronic plantar fasciitis with PRP injections is safe and has the potential to reduce pain. (Martinelli, 2012) For more discussion and references, see the Elbow Chapter. Platelet rich plasma (PRP) is a bioactive component of whole blood, with a higher concentration of platelets compared with baseline blood, and containing many growth factors, including platelet-derived growth factor, transforming growth factor, insulin-like growth factor, and vascular endothelial growth factor. The theory is that a concentrated preparation of PRP, with its inherent growth factors, may promote faster healing of injuries, when an area of injury is injected with PRP derived from the patient’s own blood (autologous). PRP injection(s) may be administered in an outpatient setting.

ACOEM:

Platelet-rich Plasma Injection is Not Recommended for Acute, Sub-Acute and Chronic Achilles Tendinopathy (Moderate Evidence (B))
No Recommendation for using Platelet-rich Plasma Injection for Acute, Sub-Acute and Chronic Plantar Fasciitis (Insufficient Evidence (I))
No Recommendation for using Platelet-rich Plasma Injection for Acute, Sub-Acute and Chronic Ankle Sprain (Insufficient Evidence (I))

Elbow

ODG:

Recommend single injection as a second-line therapy for chronic lateral epicondylitis after first-line physical therapy such as eccentric loading, stretching and strengthening exercises, based on recent research below. This small pilot study found that 15 patients with chronic elbow tendinosis treated with buffered platelet-rich plasma (PRP) showed an 81% improvement in their visual analog pain scores after six months, and concluded that PRP should be considered before surgical intervention. Further evaluation
of this novel treatment is warranted. (Mishra, 2006) This review concluded that there is strong pilot-level evidence supporting the use of prolotherapy, polidocanol, autologous whole blood and platelet-rich plasma injections in the treatment of lateral epicondylitis (LE). Rigorous studies of sufficient sample size, assessing these injection therapies using validated clinical, radiological and biomechanical measures, and tissue injury/healing-responsive biomarkers, are needed to determine long-term effectiveness and safety, and whether these techniques can play a definitive role in the management of LE and other tendinopathies. (Rabago, 2009) Using a Gravitational platelet separation system, whole blood can yield platelet-rich plasma. Specially prepared platelets taken from the patient are then re-injected into the tendon of the affected elbow. Platelet-rich plasma contains powerful growth factors that initiate healing in the tendon, but may also send signals to other cells in the body drawing them to the injured area to help in repair. Treatment with PRP is still considered investigational and further research is needed before it can be made available to the general population. According to the author, "The body has an extraordinary ability to heal itself. All we did was speed the process by taking blood from a different area, concentrating it, and putting it back into an area where there was relatively poor blood supply to help repair the damage." Early studies have shown PRP therapy may be useful in maxillofacial surgery, wound healing, microfracture repair, and in the treatment of plantar fasciitis. PRP looks promising, but it is not yet ready for prime time. PRP has become popular among professional athletes because it promises to enhance performance, but there is no science behind it yet. PRP was better than corticosteroid injections in relieving pain and improving function in patients with chronic severe lateral epicondylitis, but the study concluded that PRP should be reserved for the most severe cases since 80% of tennis elbows will be cured spontaneously without doing anything within a year. (AAOS, 2010)

**Recent research:** This RCT showed that 49% of patients in the corticosteroid group while 73% of patients in the PRP group were successful. The corticosteroid group was better initially and then declined, whereas the PRP group progressively improved. The authors concluded that treatment of patients with chronic lateral epicondylitis with PRP reduces pain and significantly increases function, exceeding the effect of corticosteroid injection. (Peerbooms, 2010) These benefits persisted even after a follow-up of 2 years. (Gosens, 2011) This RCT found success with both autologous blood and PRP, but PRP was superior to autologous blood in the short term. (Thanasas, 2011) At 6 months the authors observed a 66% success rate in the platelet-rich plasma (PRP) injections group versus 72% in the autologous blood injections (ABI) group, but there was a higher rate of conversion to surgery in the ABI group (20%) versus the PRP group (10%). In patients who are resistant to first-line physical therapy such as eccentric loading, ABI or PRP injections are useful second-line therapies to improve clinical outcomes. In this study, up to seven out of 10 additional patients in this difficult to treat cohort benefit from these surgery-sparing interventions. (Creaney, 2011) (Bisset, 2011) According to this short-term RCT, neither steroids nor platelet-rich plasma injections are any better than injections of inactive salt water for treating tennis elbow. After one month, pain had dropped by almost 10 points on a 50-point scale among people who'd had steroid injections, compared to less than two points for the PRP and saline groups. Elbow function had also improved significantly more for people injected with steroids. However, at three months, any extra benefit due to steroids had disappeared and pain and functioning were similar across all three groups. The study did not follow patients for enough time to see the long-term effects of platelets. In other studies, PRP patients continue to improve, and the glucocorticoid patients revert back to normal, as steroids only provide short-term relief and may actually damage the tendon further with repeat injections. For people who have had tendon problems for weeks rather than months or years, watchful waiting might be the most appropriate treatment, since after a year, 80% of people with tennis elbow will be cured. (Krogh, 2013)

**ACOEM:**

Platelet-rich Plasma Injection is Recommended for Chronic Lateral Epicondylalgia (Insufficient Evidence (I))
Platelet-rich Plasma Injection is Recommended for Chronic Medial Epicondylalgia (Insufficient Evidence (I))

Indications:
Lateral/medial epicondylalgia lasting at least 6 months, unresponsive or insufficiently responsive to other treatments including NSAID(s), straps, stretching and strengthening exercises, and at least one glucocorticosteroids injection. (Peerbooms 10)

Frequency / Dose:
Injection of approximately 3mL of platelet-rich plasma buffered with NS plus 8.4% sodium bicarbonate plus bupivacaine 0.5% with epinephrine (1:200,000) and used peppering technique.

Knee

ODG:
Under study. This small study found a statistically significant improvement in all scores at the end of multiple platelet-rich plasma (PRP) injections in patients with chronic refractory patellar tendinopathy and a further improvement was noted at six months, after physical therapy was added. The clinical results were encouraging, indicating that PRP injections have the potential to promote the achievement of a satisfactory clinical outcome, even in difficult cases with chronic refractory tendinopathy after previous classical treatments have failed. (Filardo, 2009) Platelets are known to release various growth factors that are associated with tissue regeneration/healing and angiogenesis, as well as a variety of chemicals (adenosine, serotonin, histamine, and calcium) that may be important in inhibiting inflammation and promoting angiogenesis. The exact mechanism of action in the context of PRP is still being investigated. The healing process in both muscle and tendon injuries starts with an inflammatory/destruction phase, followed by a repair/proliferation phase and then by a remodeling phase. This process is affected by various factors, such as growth factors, immune cells, and numerous chemomodulators, many of which are found in PRP. Findings of in vitro studies and animal studies have suggested that PRP can potentially decrease the inflammatory response and promote the repair and remodeling phases of healing in both muscle and tendon. PRP represents a novel noninvasive treatment method for patients with acute or chronic soft-tissue musculoskeletal injuries. The popularity of PRP has increased in the medical community, and it has received increased media attention in recent years, particularly because professional athletes have undergone this procedure. There is a need for further basic-science investigation, as well as randomized, controlled trials to identify the benefits, side effects, and adverse effects that may be associated with the use of PRP for muscular and tendinous injuries. Further clarification of indications and time frame is also needed. See also the Elbow Chapter. PRP looks promising, but it is not yet ready for prime time. PRP has become popular among professional athletes because it promises to enhance performance, but there is no science behind it yet. A study of PRP injections in patients with early arthritis compared the effectiveness of PRP with that of low-molecular-weight hyaluronic acid and high-molecular-weight hyaluronic acid injections, and concluded that PRP is promising for less severe, very early arthritis, in younger people under 50 years of age, but it is not promising for very severe osteoarthritis in older patients. (AAOS, 2010) PRP appears to improve the healing of patellar tendon graft sites after anterior cruciate ligament (ACL) reconstruction, but the intervention didn't have any clinical impact. The authors concluded that PRP is a promising therapy for sports injuries, but more studies are needed to clarify the specific indications. (de Almeida, 2012) Platelet-rich plasma injections can benefit patients with cartilage degeneration and early osteoarthritis (OA) of the knee, according this RCT. In patients with minimal OA, platelet-rich plasma (PRP) works better than hyaluronic acid. The evidence shows that young patients in the PRP group continued to improve a little between follow-ups and that the patients receiving hyaluronic acid get a little worse. So far, however, no medical studies support using PRP for prevention in sports medicine. (Kon, 2012) After 2 decades of clinical use, results of PRP therapy are promising but still inconsistent. (Cohen, 2012)
ACOEM:

There is no recommendation for or against the use of plasma rich platelet injections for knee sprains, anterior cruciate tears, meniscal tears, or patellofemoral pain.

**Shoulder**

**ODG:**

Under study. PRP looks promising, but it may not be ready for prime time. PRP has become popular among professional athletes because it promises to enhance performance, but there is no science behind it yet. In a blinded, prospective, randomized trial of PRP vs placebo in patients undergoing surgery to repair a torn rotator cuff, there was no difference in pain relief or in function. The only thing that was significantly different was the time it took to do the repair; it was longer if you put PRP in the joint. There were also no differences in residual defects on MRI. (AAOS, 2010) Platelet-rich plasma did not help patients recover from arthroscopic rotator cuff surgery in this study. (Jo, 2011) Platelet-rich fibrin matrix (PRFM) applied to the site of rotator cuff tendon repair does not improve healing, and in fact might impair it. There was a significantly higher failure rate in the PRFM group than in the control group for double-row/transosseous-equivalent repairs at 12 weeks. The PRFM used in the study was the Cascade Autologous Platelet System. (Rodeo, 2012)

*Recent research:* According to this RCT, autologous platelet-rich plasma injections for rotator cuff disease led to a progressive reduction in the pain and disability when compared to dry needling, and the benefit was still present at six months after treatment. (Rha, 2013) This study explored the efficacy of PRP injections in the wheelchair population with biceps tendon pathology, and found a significant effect of PRP using standardized measures compared to the opposite extremity as a control, with convincing data on the overall positive effect of PRP in the treatment of biceps tendinopathy. (Ibrahim, 2013)

**REFERENCES**

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