



## PRP Therapy: New avenue for regenerative medicine

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PUBLISHED ON FRIDAY, 08 AUGUST 2014 13:33

**Dr Avinash Date**, *DHA, Consultant Orthopaedic Surgeon, SevenHills Hospital, Mumbai* elaborates on the advantages of PRP Therapy

Platelet – Rich – Plasma (PRP) therapy was initially developed in 1970 by dental surgeons, which gathered momentum only recently after professional athletes like tennis legends Rafael Nadal and Maria Sharapova, basketball's Kobe Bryant and Andrew Bynum, golfer Tiger Woods and numerous others hit headlines after undergoing this therapy for tendon inflammation. Since this therapy uses concentrated dose of autologous platelet from patients' own whole blood and is injected at injury site, it is safe and doesn't require FDA approval. This therapy had been regarded as better treatment alternative in orthopaedic and sports injuries, which is often used in combination with orthopaedic surgeries, moreover can sometimes eliminate the need for operative procedures.



Dr Avinash Date

The crux of this therapy depends on harvesting optimum PRP, using patients' blood that helps in healing process, since this reduces the risk of infection, allergy or any other side effects. Usually the physician extracts about twenty millilitres of blood from patients' vein and spins it in REMI PRP Centrifuge to separate platelets from blood. Platelets are those components which secrete growth factors for stimulating clotting. These platelets are then injected back at the site of injury; enhancing and aggregating the platelet count in the micro-environment, thus stimulating immediate healing process. The comprehensive process takes place within 90 minutes.

PRP Therapy principally supports to heal any ligament or tissue injury except acute or last stage injuries which might not provide anticipated results. This therapy is best suitable to reduce the downtime of patient, while also decreases the chance of a more serious injury that will result in surgical intervention or permanent disability.

### PRP Therapy has been widely used to treat:

#### Tendon injury

- **Elbow Tendinopathy - Lateral Epicondylitis (Tennis Elbow):** Lateral epicondylitis or tennis elbow a condition usually caused due to repetitive gripping or swinging action which leads to strain in muscles or partial tear in tendons of elbow. This condition takes time to heal and leads to pain when performing actions like gripping, picking or swinging. Earlier physicians alleviated the condition through physiotherapy and Corticosteroid injections, but with the advent of PRP therapy treatment, patients experienced enhance relief from inflammation with the use of autologous platelet-rich plasma, that is harvested through patients own blood.
- **Achilles Tendinopathy:** Achilles tendinopathy a condition which causes swelling, pain and weakness of Achilles Tendon. This condition is quite common in professional and amateur athletics, since it is one of the long tissue muscle connecting calf muscles to heel bone. Though it can be caused by multiple factors and the injury varies between early stage and acute inflammation. PRP therapy has shown promising results in management of this condition.
- **Planter Fasciitis:** Planter fascia is the most common cause of heel pain, involves tissue bands which runs across the bottom of heels and toe. Quite common among athletes, this condition causes inflammation and pain of the tissue, often making it difficult for people to walk. This condition was been earlier treated with physiotherapy, stretching and physiotherapy aids, nevertheless it took time and lacked effectiveness. PRP therapy for plantar fasciitis involves injecting platelets in the area of the damaged tissue.
- **Patellar tendinopathy:** Patellar tendon also referred as jumper's knee since it arises in athletes mostly involved in jumping sports like basketball, volleyball, etc. This condition results in wear and tear of the tendon that connects lower portion of kneecap and shin bone. However this condition is often neglected at premature stage, then again if the tissue repeatedly undergoes strain, the injury can

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exceed rate of repair. PRP Therapy has been postulated to have enhanced healing response for this condition, instead of the earlier treatments which included medication, physiotherapy and ice.

### Ligament and muscle injuries

PRP Therapy has been gauged to heal ligament injuries which are quite common in professional and amateur athletic individuals due to frequent jumping, swinging and running activities. Formerly the treatment included physiotherapy and medication, but with the usage of PRP, the healing process has been enhanced.

### How PRP therapy works?

The muscle tissue healing typically begins with mechanisms that promote haemostasis or stoppage of bleeding. The process stimulates vasoconstriction, diminishing blood loss and exposed collagen from the damaged site draws the platelets to adhere. When platelets adhere at the micro-environment to the damaged vessel, they undergo degranulation and release cytoplasmic granules, which contain serotonin, a vasoconstrictor, ADP and Thromboxane A2. In most cases, formation of connective tissue fibres forms scar. Though in some conditions, such as fracture callus, this facilitate in the formation of new bone tissue.

The following growth factors can be found at the micro environment site of blood clot:

- Transforming growth factor beta (TGF-b)
- Platelet-derived growth factor (PDGF)
- Insulin-like growth factor (IGF)
- Vascular endothelial growth factors (VEGF)
- Epidermal growth factor (EGF)
- Fibroblast growth factor-2 (FGF-2)

All these above factors form the basis of healing mechanism which is used in the PRP process therapy. In this therapy Platelet – Rich – Plasma and that forms very small part of the whole blood component is separated by means of Remi PRP centrifuge process and injected at the site of injury which enhances and increases the platelet count multi-fold, thus speeding the healing process.

### Benefits of PRP Therapy

- **Safety:** PRP Therapy is safe since it uses patients' own whole blood to harvest platelets, which are injected at the injured site. So it is free from side effects, allergic reactions and is non – invasive.
- **Easy recovery time:** Patients typically experience discomfort post injection for less than a week. This occurs due to injecting large amount of platelet at the site of injury. Though medication is prescribed for pain management.
- **Potential benefit:** PRP therapy potentially speeds the recovery time and helps to decrease pain. As it is non – invasive it can be managed by physicians in day care centres.

Physicians are gradually considering the role of PRP Therapy in healing inflammation of effected tissues by harnessing the power of patients own blood. Patients should understand that this process is a long term solution for their injury and might take two to three cycles. Previously physicians have often tried to reduce inflammation by using anti – inflammatory medication like steroids which provided immediate, but short term relief. This therapy has few drawbacks, the major one being pain.

World is moving more and more towards finding biological solutions rather than mechanical solutions to solve such problems. This is one step towards it.

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