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Platelet Rich Plasma

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Tendon and ligament injuries are a common cause of lameness in horses. Over 30% of racehorse lameness is due to tendon or ligament injury. Traditional treatment of these injuries often requires 6 to 12 months for rehabilitation. Healing may be incomplete, resulting in a weaker healed tendon. Also, traditional treatments have a 30-50% failure rate. Because of these factors continued research for new treatment techniques for tendon and ligament injuries is an active area of equine research. In this vein, **platelet-rich plasma (PRP) therapy** for equine tendon and ligament injuries has been investigated.

What is it?

Platelets (granulocytes) are produced by cells called bone marrow megakaryocytes, which in turn are derived from stem cells. They have no nucleus for replication and generally fragment within 5 to 9 days of formation. They are the main mechanism for haemostasis (blood clotting). They aggregate at the site of injury inducing further platelet aggregation and degranulation. This degranulation is the release of many different growth factors and cytokines that the platelets carry. These growth factors promote tissue healing and regeneration.

Platelet rich plasma (PRP) mimics the final stages in the clotting cascade. PRP is an autologous concentration of platelets in a small volume of plasma. Because it is a concentration of platelets it is also a concentration of the 7 fundamental growth factors proved to be actively secreted by platelets to initiate wound healing (platelet derived growth factors aa, bb, ab and transforming growth factor b1 and b2, vascular endothelial growth factor and epithelial growth factor). It is also rich in the 3 natural scaffold proteins fibrin, fibronectin and vitronectin.

It is basically a fluid rich with all the factors required to enhance healing.

How is it made?

PRP is autologous which means 'self'. A blood sample is collected from the horse in an aseptic manner and processed to concentrate the platelets into the plasma. The crudest and simplest method is to just take straight uncoagulated blood from the horse, spin it down in a centrifuge and use the resulting plasma. There are now many ways to increase the number of platelets that are harvested into the plasma. We are currently using the '**Regen PRP ACR**' system.



The process of how PRP works is activated mainly by clotting and begins within 10min. More than 95% of growth factors are pre-synthesized within 1hr. Therefore PRP is developed in an anti-coagulated state and should be used within ten minutes of processing. Therefore, unlike IRAP, PRP cannot be frozen and stored.

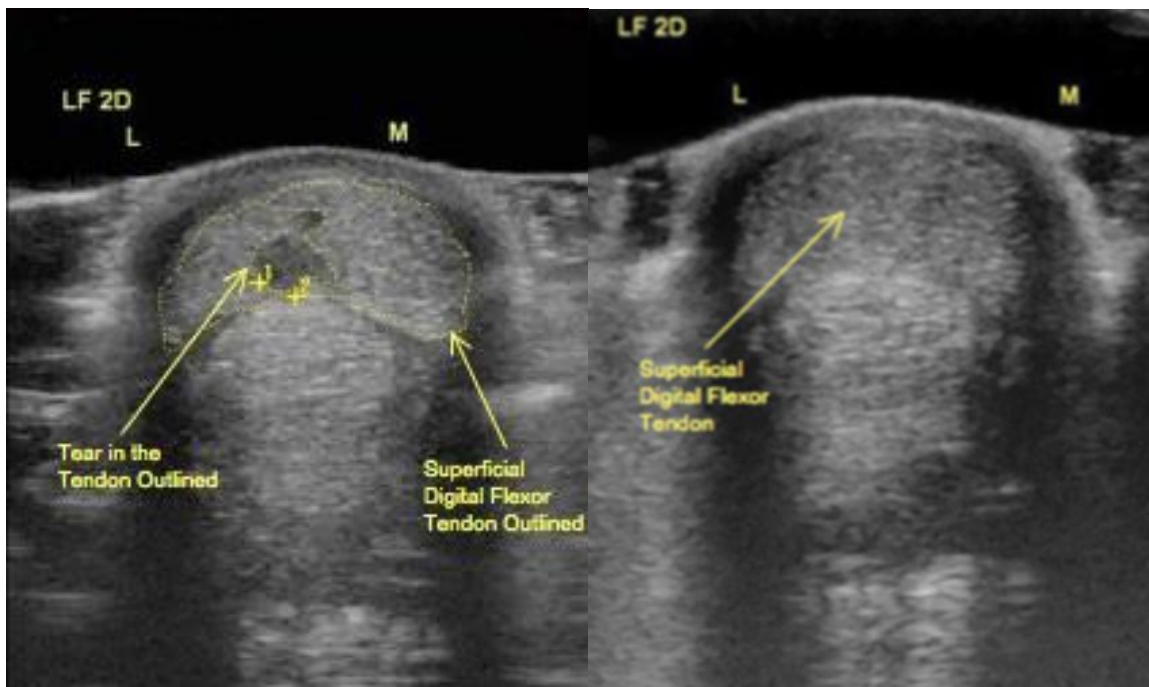
How does it work?

When injected locally, it leads to a massive increase in platelets in injured/healing tissue with subsequent degranulation of their granules which contain the synthesized growth factors. The secreted growth factors immediately bind to the external surface of the cell membranes of cells in the injured tissue via transmembrane receptors. The importance of this is that PRP does not enter the cell or its nucleus, therefore it is not mutagenic (tumour causing) and they act solely by acceleration of normal healing. Therefore, PRP has no ability to induce tumour formation. After the initial burst of growth factor release the platelets continue to release growth factors at a slower rate for the remaining 7 days of their life span.

How is it put into the horse?

The procedure is done in the standing horse under sedation and local nerve block. The PRP is injected into the lesion, often under ultrasound guidance. The limb is then bandaged. The horse is confined for a period of time, then returns to a controlled exercise protocol based on the severity of injury and level of lameness.

Re-examination with ultrasonography is conducted over the first two months, then every 60 to 90 days during the remaining healing period. In most cases only one PRP injection is needed to result in complete healing of the injury.



Tear in the SDFT prior to PRP Injection

The lesion 3 months post injection

What are its uses?

Injection of PRP is recommended for both recent tendon and ligament injuries and those injuries that have not healed using traditional rest and controlled exercise. We recommend injection of a recent injury within 30 days after occurrence.

- Tendon injuries: SDFT injuries with core lesions.
- Suspensory ligament injuries including proximal, body and branch injuries.
- Periarticular soft tissue injuries
- Wound healing: in the acute phase or when skin grafts are applied.
- Fracture healing: Sesamoid fractures, olecranon fractures and comminuted fractures.

Does it work?

The vast majority of scientific publications report a significant enhancement of healing when PRP is used. Most of the publications are in the human field of facial-maxillary surgery where adequate tissue regeneration is essential for cosmetic reasons. Although cosmetic outcome is a minor issue in equine medicine, increase in speed and quality of healing are a major concern in equine veterinary medicine.

As with so many other treatments in the equine field, evidence based studies are harder to put together. Recently however, there have been publications demonstrating *in vitro* (meaning under laboratory conditions) effects of PRP on tenocyte (tendon cells) growth as well as clinical papers reporting excellent results in the treatment of flexor tendon and suspensory ligament damage. In addition, at all recent major international equine conferences there have been presentations on PRP.

At Baker and Mcveigh, we have been using PRP with great success. We are seeing a quicker return to work, with horses 'standing up' much better to returning to racing, increasing their racing career longevity, and most importantly either returning to their previous level of performance, or improving it.

Researchers at the University of Barcelona have reported on the use of PRP in tendon and ligament injuries. Ten limbs of 7 horses with tendonitis or desmitis were treated with PRP. Lameness and flexion test scores improved after PRP injection in 6 of 6 horses evaluated. Ultrasound scores improved in 5 of 7 horses. Some horses returned to work as soon as 2 months after PRP injection.

One horse with 12 months duration of suspensory desmitis was still improving slowly 9 months after injection of PRP.

Please do not hesitate to contact us at the practice on 0215523450 if you have any other questions for PRP treatments.

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