

PALM BEACH
SPINE &
DIAGNOSTIC
INSTITUTE

Innovative Quality Care. One Patient At A Time.



August, 2013

Regenerative Injections & Platelet Rich Plasma

Introduction

Pain Medicine is a new and rapidly evolving medical specialty dealing with acute and chronic injury and pain problems. Over the last twenty years, many of the chemical and anatomic injury and pain pathways have been identified and studied. New techniques in Interventional Pain Medicine have eliminated the effects of injury and of pain, allowing many patients to return to a normal level of activity.

We will summarize the new and exciting advancements in resolving inflammation and avoiding the deleterious effects of inflammation. We will update you on treating heretofore untreatable chronic orthopedic, rheumatologic and pain problems with new regenerative techniques.



Stem Cell Technology

The promising concept of Stem Cells regenerating new tissues, and replacing damaged and diseased organs, has created a new interest in tissue damage and healing. How do we turn Stem Cells on to regenerate the desired tissue? How do we keep them activated once “turned on”, and how do we create the desired tissue which is competent in achieving the desired physiological effect?



These questions have generated worldwide research, including studies of how Stem Cells work naturally in the fetus as well as in the adult. From these studies we have learned much about injury, inflammation and the healing process which causes stem cell activation. As a result, we have been able to tailor new treatments of chronic and difficult to cure orthopedic and rheumatoid pain problems.

Inflammation

Trauma causes damage to a part of the body. The body responds by creating an inflammatory process. Inflammation is the body's protective mechanism to prevent infection and start a healing process. Numerous chemicals, including cytokines, metalloproteinase, leukotrienes, proteases, phospholipase A-2, the arachidonic acid cascade and others are released with inflammation. Antibodies and specialized cells, such as macrophages, platelets, and stem cells, are attracted to the area of injury. Most of the time repair and healing is the result of this complex process.

Chronic Inflammation



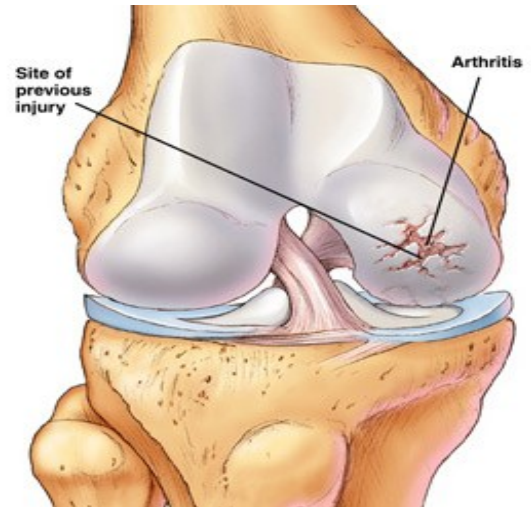
Unfortunately, with repetitive stress and with some acute injuries, the inflammatory processes continue for long periods of time or indefinitely. This is frequently seen with chronic ligament pain, tendinopathies, tendinosis, and chronic joint inflammation. Almost any part of the body can remain chronically inflamed long after the precipitating injury. Neck and back pain may result from chronic inflammation.

Preventing Chronic Inflammation

Inflammation following both open and closed injuries should resolve in a few weeks, depending upon the severity of the trauma and injury. Immobilization and anti-inflammatory medication may be indicated. If, after several weeks the inflammation has not resolved, steroid injections are often indicated. Chronic inflammation should not be allowed to continue for long periods of time.

Common Inflammatory Syndromes

Inflammation that does not resolve after several weeks often causes irreversible tissue damage and can eventually lead to permanent disabilities. Some of the chronic conditions that may respond to regenerative injection therapies are: Achilles tendinosis, tennis elbow, golfers' elbow, rotator cuff tendinosis & partial tears, sacroiliac pain, joint arthritis, trochanteric bursitis and tendinitis-tendinosis of the knee and ankle.



Regenerative Medicine

Injection of chemical stimulants to promote healing and regeneration of new tissue has been used since 1937. There are numerous studies that demonstrate the effectiveness and safety of "Prolotherapy" <http://fapmmed.net/Position.htm>. Stem Cell Tissue Regeneration and Human Platelet stimulated regeneration have become a focus of new research. Platelets have been found to contain numerous growth factors that initiate the normal regenerative healing response.

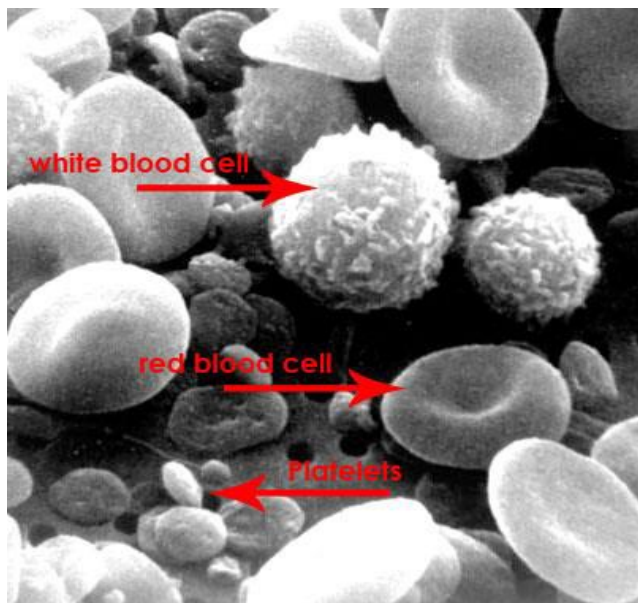
Prolotherapy

Chemical stimulants cause an irritation of connective tissue cells, initiating a release of chemical mediators which evoke a healing response. The most common stimulants create an osmotic gradient which is irritating but not lethal to the cells. Microscopic studies demonstrate increased collagen and cell matrix several months after treatment.

Platelet Rich Plasma (PRP)

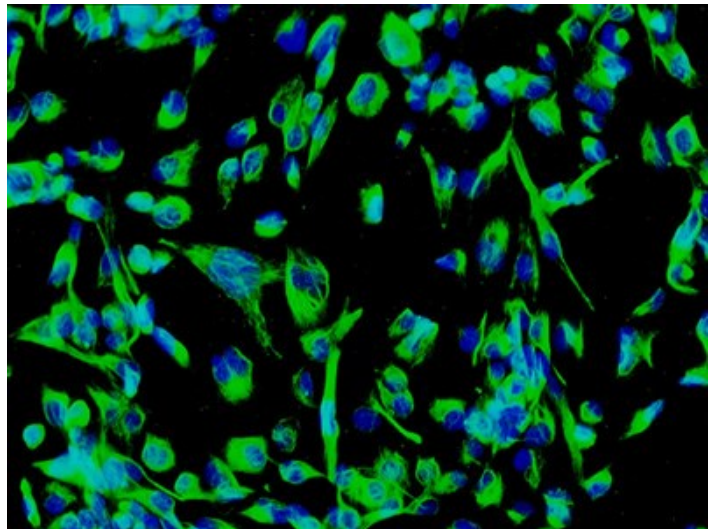
Platelets contain Bioactive Proteins that initiate healing. These proteins cause angiogenesis and collagen synthesis, increasing the matrix, vascularity, collagen content and strength of tendons, ligaments and bone. PDGF (Platelet Derived Growth Factor) helps stimulate the production of other growth factors and has a role in tissue remodeling. PDGF promotes mesenchymal stem cell replication, osteoid production, endothelial cell replication, and collagen synthesis. It is likely that PDGF is the first growth factor present in a wound and starts connective tissue healing by promoting collagen and protein synthesis.

PRP has been used since the early 1970's in orthopedics, wound care, and sports medicine. Many famous athletes have been treated with PRP to promote faster and more complete healing. Some of these athletes include: Tiger Woods, Rafael Nadal, Kobe Bryant, Hines Ward, and Alex Rodriguez.



Autologous blood is collected and centrifuged to separate out the patient's platelets. The platelets are reconstituted with the patient's serum to make the Platelet Rich Plasma. The PRP is then injected into the affected tendon, ligament or articulation. It is recommended that three treatments of Prolotherapy and/or Platelet Rich Plasma are injected one to two weeks apart. Later treatments may be required, depending upon the initial response to treatment.

Stem Cells



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