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STEM CELL & PRP PATIENT INFORMATION PACKET

STEM CELL/PRP THERAPY

Dr. Venuto is constantly striving to find less invasive, non-surgical techniques to treat tendon and joint injuries and arthritis. He dedicates himself to utilizing advanced techniques and innovative technology to improve the health and well-being of his patient population.

Although it might sound like a medical procedure that is brand new or “experimental”, platelet rich plasma (PRP) and stem cell therapy have actually been in use for some time now. Doctors have published numerous studies showing encouraging results using PRP for repairing tendons and using autologous stem cells to treat cartilage injuries and osteoarthritis.¹⁻⁵ Therefore, by using PRP and/or stem cell therapy, doctors can often postpone or, in some cases, eliminate the need for more invasive surgery.

In the past, stem cells and platelets were very difficult and expensive to extract and utilize, placing limitations on their clinical use. However, with the advancement of harvesting techniques and the production of more affordable and advanced equipment, PRP and stem cells can now be obtained from a patient, concentrated and then put to their highly effective use with a simple same-day office procedure.

BACKGROUND

PLATELET RICH PLASMA (PRP): We have long known that platelets found in our blood create a clotting cascade that stops bleeding. More recently, we have discovered the crucial role these platelets play in the actual healing process. Platelet-rich plasma (PRP) is a concentration of platelets derived from a patient’s own blood and is a natural source of numerous growth factors. It is prepared utilizing a centrifugation process that separates the liquid and solid components of anticoagulated blood. The resultant platelet-rich plasma is then injected into the patient’s pathologic tissue, releasing PRP-derived growth factors that can augment tissue healing. Many studies have shown PRP to be effective in treating many orthopaedic conditions, particularly chronic tendon conditions.¹⁻⁵

The growth factors present in PRP have also been shown to stimulate stem cell proliferation. These PRP growth factors act as catalysts for the tissue repair process and recruit stem cells to the site of injury, facilitating collagen generation and tissue healing. Some studies have also shown that PRP not only stimulates stem cell proliferation but also their differentiation into chondrogenic cells – cells that make cartilage, the tissue that degenerates in an osteoarthritic joint.⁶ Therefore, most clinicians will use PRP to augment the effects of stem cells. To put it in layman's terms, if stem cells are the seeds, PRP is the fertilizer.

STEM CELLS: Stem cells are progenitor cells that release growth factors and can differentiate into other more specific cells. In orthopaedics, mesenchymal stem cells (MSCs) have garnered the most interest because of their capacity to differentiate into chondrocytes and osteoblasts, cells that make cartilage and bone. Animal studies have shown improved repair of osteoarthritis cartilage lesions with MSCs.⁷ MSCs and hematopoietic stem cells are present in significant numbers in your own fat and bone marrow and can be easily extracted from these areas.

The bone marrow is a central compartment in your bones that produces red blood cells, white blood cells, and platelets and also has a large concentration of hematopoietic and smaller amounts of mesenchymal stem cells (MSC). However, the capacity for differentiation in bone marrow MSCs may diminish with age. Fat (adipose) cells also have abundant mesenchymal stem cells and these MSCs can be obtained with a less-invasive procedure and in larger amounts. Studies in animal models have also shown that fat-derived stem cells, used with PRP, have shown improved outcomes for cartilage repair in damaged joints.⁶ Studies have also shown improvement in pain, medication usage, and joint movement when using autologous adipose tissue-derived stem cells in patients with osteoarthritis.^{8,9}

HOW THE PROCEDURE IS DONE

Step 1: Harvesting of Platelets:

You will be brought into the procedure suite and will change into a gown. You will have 30 cc–60 cc of blood drawn from one of your veins. The amount of blood drawn will depend on the specific injury or condition requiring treatment and the type of system used. Our systems do not require more than 60 cc's of blood, which translates to 2 fluid ounces. This process is quite simple and takes a few minutes. From a patient perspective, this part of the procedure will seem familiar, as PRP extraction is no different than the process of donating blood or having blood drawn for a lab test.

The blood is then transferred from the syringe to a specialized container that is placed in a centrifuge where it is spun at an extremely high speed. This creates the necessary separation of the various elements within the blood. After being spun for approximately 15 minutes, the platelet-rich plasma (PRP) is collected and set aside.

Step 2: Harvesting of Stem Cells:

There are two areas from which we can harvest a large concentration of adult mesenchymal stem cells (MSCs): bone marrow and fat. Both areas have abundant stem cells. Based on your condition and treatment plan, your therapy may involve either one of these sites, or both. You will be placed on your side and an area on your flank, just above your hip and gluteal area, will be anesthetized with a local anesthetic. Through a less than half-inch incision, about 30 cc of adipose tissue (fat) will be extracted and/or bone marrow will be extracted from your pelvis bone. For most upper extremity conditions, fat extraction alone often nets optimal results.

These products are then spun in a centrifuge to concentrate the stem cells and, in the case of adipose (fat) extraction, create a gelatinous concentrate. The cells from your body are not treated or altered with any medications or additives.

Step 3: Implantation of PRP, Stem Cell and Gelatinous Concentrate Tissue:

The injured or degeneration joint (thumb, shoulder, knee, etc.) will then be anesthetized with a local anesthetic. The stem cells obtained above will then be injected into the injured or degenerated joint. In the case of fat stem cell extraction utilized for smaller joints in the hand, the gelatinous concentrate will be used to distract/expand your joint. The PRP will then be added to the injured area/joint as well. As mentioned above, in layman's terms, the stem cells can be thought of as the seeds whereas the PRP is the fertilization in the healing process.

TOTAL PROCEDURE TIME: On average, the total time for the entire procedure is approximately 2 to 2-1/2 hours.

** Please note that stem cell and PRP treatment should not be considered an overnight cure that will yield instantaneous results. Also realize that it is not a cure for arthritis but rather a temporizing measure that will hopefully postpone the need for surgery or other more invasive treatments. Stem cell therapy is a process that may take several months, so your final result may not be known for 2-3 months. Various factors such as age, physical activity levels and nutrition may affect an individual's response and rate of healing. Also, long-term results (5-10 years) with PRP and stem cell therapy are unknown at this time. Though it is our experience that 80-85% of patients will see beneficial results with stem cell and PRP therapy, a good clinical result cannot be guaranteed.

In order to obtain optimal results, it is necessary to follow the treatment plan that Dr. Venuto creates for you with the proper supplementations and recommendations. Braces and activity modifications will be incorporated into your treatment plan. We recommend that you inform your primary treating physician that you are undergoing this procedure and provide him/her with the medication restrictions seen below.

WHAT TO EXPECT BEFORE YOUR PROCEDURE

- If you are currently taking anti-inflammatory medications (Motrin, Advil, Aleve, Celebrex, etc.) please discontinue these medications one week prior to your procedure as well as for three days following your procedure. If you are taking 81 mg. or less of Aspirin you may continue doing so. You can take your other prescription medications as you normally would. Please do NOT discontinue or alter your routine medications without consulting us and your primary doctor. If you have any questions, please contact our office at (949) 759-3600.
- Follow your normal daily routine on the day of the procedure. Make sure to drink plenty of water (eight to ten 8 oz. glasses) during the 24 hours prior to your procedure and eat a proper breakfast and lunch (if the procedure is in the afternoon). Fasting is not required on the day of the procedure and is not advised.

WHAT TO EXPECT AFTER YOUR PROCEDURE

- If you are traveling, we recommend that you spend the night locally on the first treatment day. After the treatment you may be sore and we will prescribe empirical antibiotics and painkillers, the latter to be taken as needed. The aftercare is NOT comparable to a major surgery but we would like to take all precautions to ensure your comfort. We do not recommend that you drive the day of the procedure and ask that you travel with someone else.
- You will be numb in the treated area for approximately 9-12 hours after the procedure. While the area is numb, please refrain from any strenuous activities.
- Once the local anesthetic wears off, you may resume normal activities as tolerated. We recommend that you refrain from heavy lifting or strenuous exercise for 3-4 weeks after the procedure.
- You will experience some pain and soreness during the first week after the procedure. The initial inflammation phase may take up to 7 days and the secondary phase may last up to 14 days.
- Anti-inflammatory medications (Motrin, Advil, Aleve, etc.) can be used three days after treatment.
- You may use Tylenol and/or ice (30 minutes on, 2 hours off) if you experience soreness. Repeat as needed. You may also take the pain medications prescribed by Dr. Venuto.

- While the area is healing, you may experience the “Rollercoaster Syndrome” where you feel great one day and some return of pain the next day. This is a normal part of the healing process. However, if you experience any excessive pain or swelling or have any concerns, do not hesitate to contact our office.
- Complete your antibiotics to prevent any potential infection and keep the area of insertion/extraction clean with basic soap and water.

FREQUENTLY ASKED QUESTIONS

Are these stem cells the same as embryonic stem cells?

No. We use only your own (autologous) adult stem cells. Embryonic stem cells can transmit genetic diseases that an embryo may carry, which could turn on certain cancers. This has not been found to be an issue with using your own (autologous) stem cells.

Is it better to grow stem cells in a lab to increase their numbers?

Culturing stem cells in a lab is not compliant with FDA guidelines and there are a number of studies that conclude that this method makes the stem cells much less effective and shortens telomeres, which impairs stem cell function. More importantly, there is speculation and evidence that growing stem cells out of the body may result in mutations to the cells possibly causing tumor lines and risks of exposing the cells to contamination.

What is the downtime from a stem cell or PRP procedure?

We recommend that you refrain from heavy lifting or strenuous exercise for 3-4 weeks after the procedure.

Is this a safe procedure?

Yes. While there are risks associated with any procedure, in this case we are using what your body makes naturally, concentrating the vital parts necessary for healing and transplanting it to the area needing it most. There have been no reports in the medical literature showing adverse reactions from stem cells and platelets when using the patient’s own cells and injecting them back into the body the same day. There is no alteration of your cells.

Our procedures follow FDA guidelines and we hold ourselves to rigorous laboratory and clinical standards to ensure patient safety and trust in our procedures. All outside resources, service providers and specialists must meet our standards of integrity and service. Only those companies that maintain their commitment to the highest standards of safety and product quality warrant our support.

To maintain sterility, all procedures and processing are performed in the same room as the patient. Complications with this procedure are exceedingly rare but include bleeding, infection and superficial nerve damage.

How often does the procedure work?

Like any medical treatment, there is no 100% guarantee that this procedure will work. It is not a cure for arthritis. However, we have experienced an 80-85% success rate defined by decreased pain and improved function. Our office has performed hundreds of stem cell and PRP treatments with results equaling or surpassing other traditional interventions (anti-inflammatory medications, therapy, cortisone injections, etc.) In a very small percentage of cases, additional treatments are needed or the patient's stem cells do not have enough reparative potential relative to the severity of their condition.

If the stem cells or platelets do not work can I still have surgery?

Yes. Although stem cell and PRP treatments often postpone and, at times, can eliminate the need for more aggressive treatment such as surgery, there is nothing about these procedures that would preclude you from having traditional surgery.

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