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REGROW HEALTHY TISSUE AFTER INJURY WITH AMNION INJECTIONS

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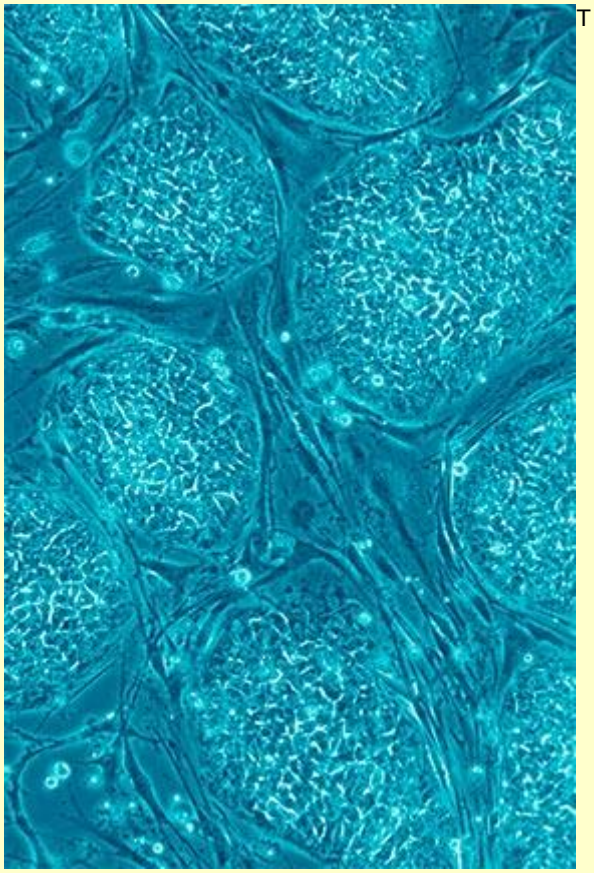

The placenta has been used for a century as a source of human donor tissue because of the regenerative properti provided by mesenchymal stem cells, combined with a lack of host rejection. Mo recently, research in the rapidly expanding field of regenerative sports medicine has been turning up promising uses for this vital, nourishing organ in the form o amniotic membrane (or “amnion”) injections.

The cure for some chronic sports injuries can be elusive, with the most challeng aspect being the return to sports without chronic pain or a permanent injury. So

patients are turning to amniotic membrane injections to regenerate healthy tissu around an injury, rather than letting it heal into problematic scar tissue.

Because the literature supporting another regenerative treatment, platelet-rich plasma (PRP) injections, remains controversial, it is especially timely to conside amnion injection as an option. Recently published randomized and case studies reported improvement in new healthy cell growth with amnion injection.

Unlike PRP, amnion does not require the patient's own blood. And though they b theoretically deliver a "regenerative punch" to the injured tissues by concentrati growth factors calling into action the body's own adult stem cells to repair the damage, platelet-derived growth factors are less effective because adult stem c are already significantly differentiated and unable to regrow into the useful, less differentiated progenitor cell lines. (Progenitor cells are early descendants of embryonic stem cells, and are, in turn, more limited in what they may become th embryonic stem cells.)

Mesenchymal stem cells as progenitor cells
Mesenchymal stem cells (MSCs) are a specific class of tissue-specific stem cell present in the fetus (in the blood, liver, bone marrow and kidneys), and sparsely present in the adult human body (bone marrow, kidneys, lungs and liver). They possess bone- and fat-producing differentiation potentials under appropriate conditions. Research shows that placenta-derived cells have multi-lineage differentiation potential similar to MSCs in terms of morphology, cell-surface antigen expression, and gene expression patterns. The placenta is therefore a useful source of MSCs.

Properly processed, amniotic membrane preserves the complete spectrum of hu growth factors. Some products actually contain living mesenchymal stem cells. Amnion injection stimulates tissue remodeling by modulation of tissue colony aggregates that resembles the genesis of embryonic tissue cell lines in the fetus Amnion cells are also immune-privileged. Therefore, host vs. graft rejection has been reported.

Tendons and ligaments are some of the strongest connective tissues of the body and as such, are subject to common overuse injuries from cumulative microtraur Tendon cells, or tenocytes, are elongated fibroblast type cells. The cytoplasm is stretched between the collagen fibers of the tendon. They have a central cell nucleus with a prominent nucleolus. Tendon cells have a well-developed rough endoplasmic reticulum and they are responsible for synthesis and turnover of tendon fibers and ground substance. Tendon cells form a connecting layer betwe the muscle.

Less invasive than surgery with rapid results
Treatment of sports injuries with amniotic membrane injection offers advantages over other invasive or surgical methods. Typically the patient will be evaluated a thorough physical exam and different imaging modalities that may include radiographs, echo sonogram or musculoskeletal ultrasound, MRI or a combinatic of these. Once the problem is ascertained, treatment involves rest, ice, compression and elevation (RICE), custom orthoses, bracing, athletic tape strappings and physical therapy adjunctive modalities.

However, when rapid recovery is desired, amniotic injections offer a promising alternative. Several products are available, all of them manufactured from donat placentas delivered from planned cesarean-section births. These are processed under FDA-approved, proprietary-patented processes that consist of antisepsis minimal tissue manipulation in order to qualify for human tissue implantation.

Procedure
The office-based injection procedure involves provision of local anesthesia, preparation of the site with aseptic technique, reconstitution of the dry placenta particulate or thawing of the prefilled cryopreserved syringe. The injection is the applied with minimal trauma to the patient and a light sterile bandage is applied The practitioner may opt to immobilize the extremity for a short period and recommend icing and narcotic analgesics for pain control if necessary. The physician will also withhold post-injection corticosteroids or NSAIDS to avoid disrupting the adult MSCs from cascading to the treatment site, having been activated by the injection of placental growth factors.

The convalescence period is typically short: from three to five days of rest, with gradual return to regular activity at the patient's own tolerance.

Personal experience
The authors have experience with tendon-injury injections including favorable outcomes for a series of Achilles tendon injections by Dr. Alberto Abrebaya and Dr. Ben Pearl to his patients and his own injured Achilles tendon. The plantar fascia, capsule and joint regions of the foot and ankle are other areas that dema attention for amnion injections. The injections are usually successful as a singu monotherapy, but may be repeated as necessary in different anatomical areas without limitation until complete healing is achieved.

In conclusion, clinical experience is building a strong base of case-evidence for allograft injection of amniotic membrane. This alternative treatment can further enhance nonsurgical healing of sports injuries from Achilles tendinosis, tendinopathies, plantar fasciitis of connective tissues and bone and joint maladies. Further study of the mechanism of action of amniotic membrane on th physiology of tendon healing will inevitably unveil useful information enhancing successful outcomes for these types of regenerative therapies in many debilitati musculoskeletal ailments, which currently embody the "Achilles Heel" of non-surgical treatments for sports injuries.

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