

Stem Cell Therapy Improves Tendon Healing and Provides Functional Improvement in Chronic Tendinopathies

Tendinopathies are common and often debilitating injuries caused by chronic repetitive movements or overuse. Current, conservative treatment options including rest, anti-inflammatory medications (NSAIDs), steroid injections, and physical therapy often have limited success because they only address the physical symptoms and not the underlying pathophysiology of the problem, resulting in a high rate of injury recurrence, functional disability, and chronic symptoms.

Recently, stem cell therapy has become a new and exciting treatment for chronic tendinopathy. Mesenchymal stem cells retain the ability to differentiate into any type of connective tissue (bone, tendon, ligament, cartilage, etc.) while embryonic and amniotic stem cells can differentiate into any cell type. By injecting stem cells at sites of tendon damage, the undifferentiated stem cells can receive the environmental cellular cues normally received by tendon cells in the area to differentiate into tendon cells and replace the damaged tissue.

A systematic review of human clinical studies utilizing stem cell therapy in the treatment of chronic tendinopathies was performed, with the objective of identifying whether these therapies are effective in improving functional outcomes and tendon healing in patients with chronic tendinopathies. In the 6 studies included in the final analyses, chronic tendinopathy was defined as prolonged symptom duration of greater than 6 months and failure to respond to conservative treatment. 125 patients with chronic tendinopathies of the patellar, Achilles and lateral elbow tendon were included, with 100 tendons in the treatment group and 47 tendons in the control group. All patients in the treatment group received one injection of stem cells to the affected tendon. During the follow-up period (ranging from 6 months to 6 years), patients in the stem cell treatment group had no serious complications and demonstrated an average improvement in pain and/or functional outcomes of 61% (range of 42-127%). Patients in the control group displayed improvements ranging from 16% to 41% following conventional treatment, but also reported residual symptoms. MRI/ultrasound assessments were completed in 4 of the studies and revealed restoration of tendon structure as well as decreased tear size and tendon thickness in the patients receiving the stem cell injections. Based on these studies, stem cell therapy is a safe treatment for patients with chronic tendinopathies, effectively reverses functional deficits and enhances tendon healing, and presents an attractive alternative treatment for patients who have not had their symptoms alleviated by traditional treatment modalities.