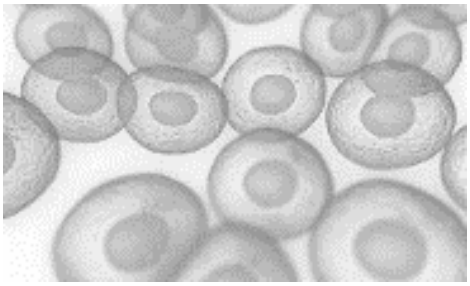
# Stem Cell Treatment of Osteoarthritis

Osteoarthritis (OA) is a chronic disease that affects all genders, ages and races but is most common in the elderly and in obese people. A degenerative disease of the connective tissue, it mainly affects articular cartilage. Symptoms may include joint pain, stiffness and tenderness. Furthermore, as the amount of cartilage decreases, the bone surface may also become affected, resulting in the development of osteophytes (bone spurs) and direct bone-on-bone contact. In addition, patients often attempt to avoid pain by minimizing movement, which leads to muscle atrophy and laxity of the ligaments.

The development of knee OA has been linked to biomechanical and biochemical changes in the cartilage of the knee joint. Recently, synovial inflammation secondary to joint nerve dysfunction has also been identified as a factor limiting knee cartilage repair.



The fluid inside the joint naturally contains mesenchymal stem cells (MSCs) which can differentiate into cartilage cells, but newly deposited cartilage is very fragile and can be destroyed by applying a minimal amount of stress on the joint. Additionally, there is only a limited quantity of MSCs in the joint available to differentiate and the process is slow.

Stem cell treatment involves injecting additional stem cells into the joint space to support the self-healing of cartilage, resulting in relief from OA symptoms. Growth factors from platelet-rich plasma are injected as part of the treatment to encourage the stem cells to differentiate into cartilage tissue. This treatment is often used in conjunction with others in order to improve patients' functional status and quality of life.

Stem cells used in therapies are allogeneic MSCs sourced from donated human umbilical cord tissue or placenta after normal, healthy births where the mother has been tested for infectious disease and has a verified medical history. These harvested MSCs are then screened to International Blood Bank Standards (Stem Cell Institute, 2012).

***The aim of stem cell treatment is to support the self-healing of joint cartilage, resulting in relief from osteoarthritis symptoms.***

Umbilical cord and placenta tissues provide an abundant supply of mesenchymal stem cells avoiding the need to harvest stem cells from the patient by invasive procedures such as liposuction or bone marrow aspiration. There is evidence that mesenchymal stem cells from umbilical cords are more robust than those from other sources such as fat or bone marrow.

In recent years, the role of stem cells in health and disease is a topic of high interest for biomedical research, especially regenerative medicine. The number of clinical cases utilizing stem cell therapy for knee OA is increasing.

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