

## Regeneration of Full-thickness Supraspinatus Rotator Cuff Tendon Tear after Treatment with Autologous Mesenchymal Stem Cells

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### ABSTRACT

Rotator cuff tear (RCT) is primarily a disease of middle-aged and older patients. Observational data estimated linear increment in the frequency of RCT over time due to the degenerative process. However, a good proportion of tears in older patients are asymptomatic and do not require any intervention. Sport and non-sport Injuries can contribute to RCTs. Many RCTs can be treated non-surgically with anti-inflammatory medication, steroid injections, and physical therapy for symptomatic relief and to restore shoulder strength and function. Rotator cuff tendon tears have limited ability to heal on their own and most often surgical repair is recommended in people failing non-operative therapy. The recovery time after surgery can be a lengthy process. There are no conclusive data to support the routine use of biologic therapy like mesenchymal stem cells (MSCs) or platelet-rich plasma (PRP) in the treatment of symptomatic RCTs. Herein we report a full-thickness supraspinatus tear (SST) in an elderly patient's shoulder following three injuries. The tear was confirmed by ultrasound scan (USS) and magnetic resonance imaging (MRI) with SST of 9 mm in length and 13 mm in width which was unresponsive to anti-inflammatory medicines, rehabilitation, and steroid injections. The subject, however, did have a definitive clinical and radiological response to a single therapeutic injection using autologous adipose tissue-derived MSCs combined with PRP, the injections were performed by ultrasound guidance into the subacromial bursa, supraspinatus tendon and tendon insertion respectively. After five months an USS showed some healing of the SST. Eight months post-MSCTherapy the subject had significant improvement in symptoms, and dramatic improvement of the Disability of the Arm, Shoulder and Hand (DASH) score from baseline of 88.3 prior to the therapy to 16.3 at the final visit. Follow-up MRI scan revealed complete healing of the SST indicating the possible successful outcome of MSC therapy as an alternative non-surgical treatment.

**Keywords:** Mesenchymal stem cells, Rotator cuff regeneration, Tendon repair, Non-surgical

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