

# A Series of Autologous Bone Marrow Concentrate Injections Effectively Reduces Pain in Patients with Symptomatic Knee Osteoarthritis: A Case Series

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**BACKGROUND:** Current research provides short-term follow up evidence regarding outcomes of a single intra-articular injection of autologous bone marrow aspirate concentrates (BMAC) in patients presenting early stage knee OA. However, investigation of a series of BMC injections could provide evidence of prolonged functional improvements and pain reduction for patients with moderate to severe OA. The purpose of this abstract is to report on clinical cases from three symptomatic moderate to severe knee DJD patients that underwent a series of autologous BMC injections using a superolateral patella approach.

## **CASE PRESENTATIONS:**

**PATIENT 1:** A 74-year old man suffering from bilateral knee DJD and extensive posterior knee pain underwent two bilateral knee BMC injections approximately 11 months apart. The first BM harvest removed 90 mL of BMA from the left PSIS while the second procedure removed 32 mL of BMA bilaterally from the PSIS. The respective BMC volumes, 11 mL and 9 mL were then injected into the intraarticular section of both knees.

**PATIENT 2:** A 70-year old female presenting chronic right knee pain and right knee DJD underwent two right knee BMC injections approximately 4 months apart. The bone marrow harvest procedures removed 120 mL and 90 mL of BMA respectively for both procedures. The BMC volumes, 7 mL each, were then re-injected into the intraarticular aspect of the right knee.

**PATIENT 3:** A 71-year old female with a history of bilateral knee DJD underwent three BMC procedures. The right knee BM harvest removed 60 mL of BMA; the bilateral harvest removed 90 mL; the second left knee harvest removed 60 mL from the PSIS. The respective BMC volumes for the right knee, 6.5 mL and 6 mL, and the left knee 6ml and 7.5 ml were injected into the intraarticular section of the knees.

## **RESULTS:**

**PATIENT 1:** Patient reported 100% resolution of his left knee pain and approximately 80% in his right knee.

**PATIENT 2:** Patient reported a 90% pain relief of the right knee for up to 7 weeks after her first BMC injection. Additionally, the patient reported an improved average right knee pain scale of 2 out of 10 eight weeks after her BMC injections from 4 out of 10 reported at initial evaluation.

**PATIENT 3:** Patient reported greater than 50% relief with mild joint tenderness of the right knee and significant pain relief of the left knee 8 weeks post initial BMC injections, and 90% relief of right knee pain at 20 weeks post initial right knee BMC injection. Additionally, patient reported sustained pain improvement of 80% in the right knee and 95% in the left knee 24 weeks post second BMC injections.

**CONCLUSIONS:** Despite inconsistent results in past studies, these outcomes suggest that a series of BMC injections effectively reduces pain in patients with symptomatic, late-stage knee OA. These results suggest that with optimized procedure timelines, serial BMC injection could be a promising treatment to treat osteoarthritis and degenerative joint disease given that current treatments focus on symptomatic relief opposed to environmental change of the joint.