Case Report

ISSN 2639-9512

Stem Cell & Regenerative Medicine

BMAC Injection Improves 65-Year Old's Knee Osteoarthritis Pain

Lin J[1]* and Mila Scheinberg[2]

[1]*2226 Huntley Dr. Tustin, California, USA.*

[2]*Resident Physician, The University of Alabama at Birmingham, USA.*

***Correspondence:**

Joelle Lin, 2226 Huntley Dr. Tustin, California, USA.

Received: 11 Jul 2023; **Accepted:** 14 Aug 2023; **Published:** 19 Aug 2023

Citation: Lin J, Mila Scheinberg. BMAC Injection Improves 65-Year Old's Knee Osteoarthritis Pain. Stem Cells Regen Med. 2023; 7(1): 1-2.

ABSTRACT

This case study presents the challenging scenario of a 65-year-old male who suffered from debilitating knee pain resulting from preexisting arthritis. Despite various attempts to alleviate the pain, including a corticosteroid injection and activity modification, the patient's condition continued to deteriorate, leading to limited mobility and reliance on a cane to ambulate. With the failure of conservative measures, the patient's orthopedic surgeon contemplated the possibility of a total knee replacement. However, the patient opted for an alternative treatment plan involving bone marrow aspirate concentrate (BMAC) injections. After an initial left knee aspiration, two injections of BMAC were administered. Remarkably, three weeks after the first injection, the patient's condition improved by 90%, and the pain during physical activities reduced significantly. At the patient's final appointment, he reported being able to walk up and down the stairs without pain. Four months after treatment, the patient embarked on a journey to the Swiss Alps where he spent upwards of four hours a day climbing in the mountainous terrain. He expressed a total absence of pain while navigating up and down the steep landscape. This case study highlights the potential efficacy of BMAC injections as a non-surgical treatment option for knee osteoarthritis pain management. Further research is necessary to evaluate long-term outcomes of this treatment approach.

Keywords

Arthritis, Knee pain, Patellofemoral arthritis.

Introduction

Patellofemoral arthritis refers to the deterioration of the joint space between the patella and femur caused by osteochondral degeneration. This type of arthritis typically involves chondromalacia, characterized by degeneration of the articular cartilage, and irregular patellar tracking within the trochlear groove [1]. Non-surgical management options include physical therapy, weight loss, cold therapy, bracing, anti-inflammatory, and corticosteroid injections. Based on recent articles discussing treatment options for this condition, it is recommended that if patients don't experience improvement in symptoms, soft tissue realignment procedures, tibial tubercle osteotomies, autologous chondrocyte implantation and patellectomy are treatment options. Nevertheless, there is a lack of adequate treatment outcomes reported in comparative studies, and authors of different studies have not reached a consensus. Achieving agreement on the optimal treatment approach will necessitate conducting more high-quality clinical studies that investigate the underlying causes of patellofemoral arthritis and assess the long-term results of various treatments. Surgery is not always the best option even if many conservative measures have been exhausted. Surgical procedures carry risks, complications, long recovery time, post-operative pain, and many more potential sequelae.

Case Section

In June 2018, a 65-year-old male, presented to a regenerative medicine clinic for evaluation of his left knee pain. The patient reported experiencing pain for 30 days prior to his appointment. He had no associated traumatic injury, leading experts to believe the pain was caused by his pre-existing arthritis. Despite receiving a corticosteroid injection in the left knee, the patient experienced no relief. The pain was described as sharp, severely limiting the patient's ability to engage in physical activities, such as exercising and walking. The patient was asked to rate his pain on a 0-10 scale. The patient rated his pain on a 0/10 scale as a 0/10 when resting. When active, the patient experienced pain of 7/10. During the evaluation, the patient expressed that the pain significantly impacted his life. The patient was advised to undergo total knee replacement as a potential treatment option.

Vital Signs upon arrival

Height: 1.68 meters
Weight: 82.55 kilograms
BMI: 29.37
Blood Pressure: 134/82
Pulse: 68 beats/minute

Physical exam

Physical examination revealed mild tenderness distal to the patella upon palpation in the left knee. There was no presence of edema, erythema, or warmth. There was no crepitus present, and the range of motion was normal; 120 degrees flexion and 0 degrees extension. Examination of the lungs indicated clear breath sounds bilaterally. The heart exhibited a regular rhythm and rate. The abdominal region was soft and nontender. Motor strength assessment showed full strength in upper and lower extremities (5/5 strength). No signs of cyanosis, clubbing or edema were observed. Neurological and psychiatric evaluation demonstrated intact reflexes and sensation in all areas. The patient was alert and oriented. X-ray imaging, conducted in May 2018, revealed no acute bone abnormalities, and showed moderate degenerative changes in the patellofemoral joint.

Treatment plan

After an initial consultation, the patient received a recommendation for a BMAC injection. During the first initial visit, the treatment involved aspirating 4CC of clear yellow joint fluid from the left knee joint under ultrasound guidance. 19CC of bone marrow was harvested from the right iliac crest. The harvested bone marrow was spun and the resulting 5CC of BMAC was combined with 1CC of 1% Ropivacaine. The solution was injected into the joint capsule of the left knee under ultrasound guidance.

Two weeks later, the patient attended his follow-up appointment, and reported a significant improvement of 80-90% in his condition. He requested and received a second BMAC injection the same day. He reported that he no longer needed a cane for walking and no longer experienced sharp pain when getting out of the car. Furthermore, the patient stated that he no longer relied on painkillers or heat application for pain relief. He rated his pain as 0/10 at rest. During physical activities, his pain level was rated as 1/10. The patient stated that he discontinued the use of a cane for walking. The right iliac crest had healed without infection and was non-tender to palpitation. During the second visit, the patient received an additional BMAC injection, but there was no effusion to aspirate.

During the patient's third appointment in mid-July 2018, the patient reported significant improvement, with 90% overall progression and 95% reduction in pain. Although he occasionally experienced minor twinges of pain, he no longer required a cane for walking.

Discussion

As an alternative treatment plan, the patient was recommended BMAC injections instead of surgery. BMAC injections are often considered as an alternative to surgery for patellofemoral osteoarthritis. "Human bone marrow (BM) is a kind of source of mesenchymal stem cells (MSCs) as well as growth factors and cytokines that may aid anti-inflammation and regeneration for various tissues, including cartilage and bone. However, since MSCs in BM usually occupy only a small fraction (0.001%) of nucleated cells, bone marrow aspirate concentrate (BMAC) for cartilage pathologies, such as cartilage degeneration, defect, and osteoarthritis, have gained considerable recognition in the last few years due to its potential benefits including disease modifying and regenerative capacity" [2,3]. A recent study involving 96 patients showed promising results. All the patients were symptomatic to patellofemoral arthritis and were non-responders to conservative methods of management. The patients were divided into two groups, one group receiving the BMAC injections and the other placebo. The patients receiving the BMAC injections reported no adverse events during the procedure and experienced improvements in pain. Knee functionality and stability at the 12-month follow up appointments revealed improvements as well. The MRI also revealed that after the BMAC treatment, the patients experienced stabilization in cartilage loss. However, the patients who weren't treated showed significant cartilage loss [4].

Conclusion

This case report highlights the potential benefits of BMAC injections as a treatment option for knee osteoarthritis. While surgery may not always be the ideal solution, alternative options such as BMAC injections offer promising results. It is important to note that individual responses to treatment can vary. Further research and exploration of regenerative therapies require more studies to determine long-term outcomes.

References

1. https://www.ncbi.nlm.nih.gov/books/NBK513242/
2. Kim YM, Joo YB. Patellofemoral osteoarthritis. Knee Surg Relat Res. 2012; 24: 193-200.
3. Kim GB, Seo MS, Park WT, et al. Bone Marrow Aspirate Concentrate: Its Uses in Osteoarthritis. Int J Mol Sci. 2020; 21: 3224.
4. Alain Silvestre, Sylvain Bise, Christophe Delavigne, et al. Intra-articular Injection of Bone Marrow Concentrate for Treatment of Patellofemoral Osteoarthritis: Preliminary Results Utilizing an Ultrasound-Guided Marrow Harvesting Technique, Journal of Vascular and Interventional Radiology. 2023; 34: 71-78.