An Outcome of Our Combination Therapy for Kienböck Disease: Bone Marrow Transfusion Using Non-Concentrated Bone Marrow, Low-Intensity Pulsed Ultrasound, and External Fixation

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Objective: For Kienböck disease, we performed the combined therapy that includes non-concentrated bone marrow transfusion, low-intensity pulsed ultrasound (LIPUS), and external fixation. This treatment have no less the good outcomes than the other treatments. Here, we report an outcome of our therapy.

Methods: [Surgical and treatment protocols] Under general anesthesia, we inserted two pins into the second metacarpal and radial diaphysis to install a bridging external fixator. We created a 2 cm transverse incision over the lunate, retracted the extensor tendon with preservation of the joint capsule, and placed a radiolucent drill guide based on our profile over the joint capsule. Next, we drilled three holes with a 2 mm diameter drill. We collected BM samples (approximately 5 mL) from the iliac crest or radius by aspiration, and transfused the BM, keeping non-concentrated, into the lunate through the drill holes to fill the space. The external fixator was fixed in slight traction with the wrist in a neutral position, and was removed after 2 months. LIPUS was introduced daily for 20 min. The period of LIPUS ranged from 3 days to over 4 months.

[Subjects] The therapy was performed in 34 patients (19 men and 15 women). The preoperative Lichtman stages were stage II in 9 cases, stage IIIa in 18 cases, and stage IIIb in 7 cases. The mean age at surgery was 43 years (range 15–73), and the mean follow-up period was 56.9 months (range 12–194). The overall results were evaluated using the Nakamura scoring system for Kienböck disease. MRI was performed for all patients at the preoperatively and postoperatively.

Results: Wrist pain improved to no pain in 23 patients, mild pain in 9 patients. On Nakamura’s score were excellent in 6 patients, good in 21 patients, fair in 6 patients, poor in 1 patient. In 24 patients (70%), an improvement of the MRI was observed postoperatively.

Conclusion: We reported the good clinical outcomes of our strategy for Stage II or III of Kienböck disease in average almost 5 years follow-up. The recovers of MRI signal were no less the good result than another treatment of Kienböck disease.