SCIENTIFIC ARTICLE

Radius Core Decompression for Kienböck Disease Stage IIIA: Outcomes at 13 Years Follow-Up

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Purpose This study was designed to analyze the long-term clinical and radiological outcomes of a series of patients with Kienböck disease stage IIIA treated with radius core decompression.

Methods This retrospective study included 15 patients with Kienböck disease (Lichtman stage IIIA) who underwent distal radius metaphyseal core decompression between 1998 and 2005 and who were followed-up for at least 10 years. At the last follow-up, the patients were evaluated for wrist range of motion and grip strength. The overall results were evaluated by the modified Mayo wrist score and visual analog scale pain score. We also compared the radiological changes between the preoperative and the final follow-up in their Lichtman classification and the modified carpal height ratio.

Results The mean follow-up period was 13 years (range, 10−18 years). Based on the modified Mayo wrist score, clinical results were excellent in 6 patients, good in 8 patients, and poor in 1 patient who required a proximal row carpectomy as revision surgery. The mean preoperative pain according to the visual analog scale was 7 (range, 6−10) and was 1.2 (range, 0−6) at the final follow-up. Compared with the opposite side, the average flexion/extension arc was 77% and the grip strength was 80%. All patients, except 1, returned to their original employment. At the final follow-up, 3 patients had decreased modified carpal height ratio, 12 remained unchanged. Radiographic disease progression according to the Lichtman classification to stages IIIB to IV occurred in only 2 wrists. There were no complications related to the core decompression.

Conclusions In this limited series, the radius core decompression demonstrated favorable long-term results and could be considered as a surgical alternative for stage IIIA of Kienböck disease. *(J Hand Surg Am. 2017;■(■):1.e1-e6. Copyright © 2017 by the American Society for Surgery of the Hand. All rights reserved.)*

Type of study/level of evidence Therapeutic IV.

Key words Kienböck disease, avascular necrosis, lunate, core decompression, long term.

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STAGE IIIA OF THE LICHTMAN classification for Kienböck disease is characterized by collapse of the lunate, with preservation of carpal height and intercarpal alignment.[1] Several surgical procedures have been proposed to treat this condition, including joint-leveling procedures by either radial shortening or ulnar lengthening, intercarpal arthrodesis, and vascularized bone grafts.[2,3] Most of these procedures have been reported to have good clinical results, despite the wide differences between them.[4–6]

Core decompression techniques for the treatment of early stages of Kienböck disease have demonstrated benefits similar to joint-leveling procedures (reduction in pain, improvement in functional activity, and improvement of motion), but are much simpler techniques with almost no complications.[7]

The purpose of this study was to analyze the long-term clinical and radiological outcomes of a series of patients with Lichtman stage IIIA Kienböck disease treated with distal radius core decompression.

MATERIAL AND METHODS

A retrospective study was carried out with the approval of our institutional review board**.** The inclusion criteria were patients with Kienböck disease (Lichtman stage IIIA) who underwent distal radius metaphyseal core decompression and were followed up for at least 10 years. Exclusion criteria were stage I, II, IIIB, or IV of the Lichtman classification, skeletally immature patients, and/or those with previous surgery of the wrist. Between 1998 and 2005, 66 patients with Kienböck disease were treated in our institution. Seventeen patients met the inclusion criteria, but 2 were lost to follow-up, leaving 15 patients in the study, 10 men and 5 women, with a mean age at the time of treatment of 42 years (range, 28–64 years). The dominant hand was affected in 9 patients. The mean follow-up period was 13 years (range, 10–18 years). Eight wrists had negative ulnar variance and 7 had neutral ulnar variance. No additional procedures were performed accompanying the radius core decompression.

Functional assessment

Clinical evaluation was performed by 2 independent surgeons/researchers using a hand-held goniometer to measure the active range of motion of the wrist in flexion and extension. Grip strength was measured with a Jamar dynamometer (Patterson Medical Co, Bolingbrook, IL) and reported as the average of 3 attempts. We corrected for hand dominance by assuming the dominant side to be 10% stronger. Both range of motion and grip strength were compared at final follow-up with the contralateral side. Preoperative and postoperative pain were measured with the visual analog scale (VAS; 0, no pain; 10, worst possible pain). Both subjective and objective clinical outcomes were assessed using the modified Mayo wrist score, in which scores between 90 and 100 points were graded as excellent, 80 to 89 points as good, 65 to 79 points as fair, and less than 65 points as poor.[8]

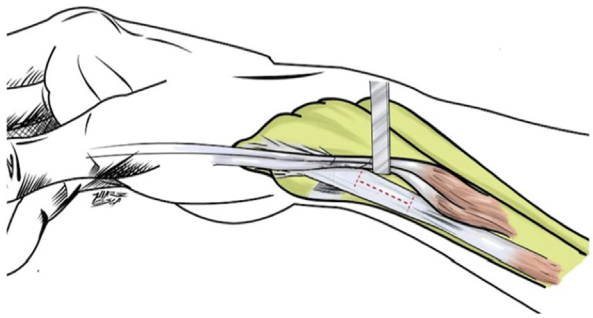

FIGURE 1: Illustration of the lateral aspect of the distal radius. The first dorsal compartment tendons are retracted and the longitudinal H shape incision over the brachioradialis distal tendon is shown.

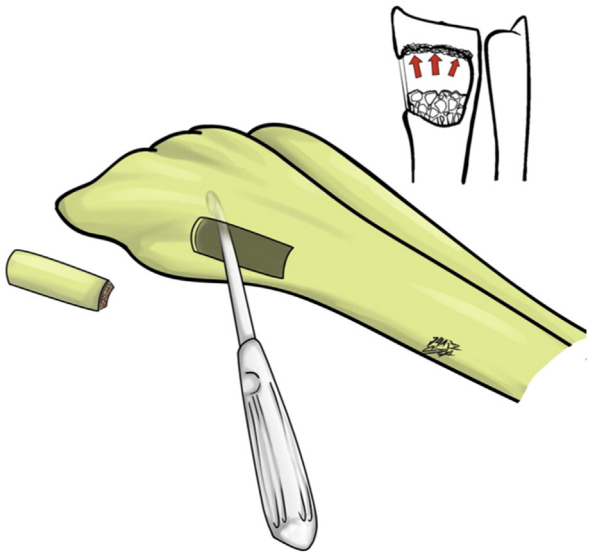

FIGURE 2: Illustration of the distal radius. The core decompression is performed through a cortical window of 2 cm long and 0.5 cm wide.

Radiological assessment

Preoperative and postoperative radiographic assessment with standard posteroanterior and lateral x-rays of the wrist was performed by 2 authors (P.D.C. and E.E.Z.). Radiographic measurements included the modified carpal height ratio, measured according to Nattrass et al[9] (carpal height divided by capitate length in the anteroposterior view) as well as the Lichtman classification.

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