

*Priya R., Suleman S.S.*

**KIENBÖCK DISEASE IN YOUNG ADOLESCENT AND MIDDLE AGED PATIENTS:  
MIDTERM RESULTS OF RADIAL SHORTENING AND WEDGE OSTEOTOMY**

**Tutor: MD, PhD, associate professor Bepalchuk A.P.**

*Department of Traumatology and Orthopedics with Advanced Training and Retraining Courses  
Belarusian State Medical University, Minsk*

**Relevance.** Kienböck's disease is an uncommon, debilitating condition characterized by avascular necrosis of the lunate bone. It is most frequently diagnosed in young, active adults, often presenting with persistent dorsal wrist pain, decreased grip strength, and progressive functional impairment. The disease's pathophysiology involves compromised lunate vascularity, mechanical loading due to ulnar-negative variance, and possible anatomical abnormalities such as lunate morphology or radial inclination. Lichtman's classification system stratifies the condition into stages I through IV, from early signal changes to complete lunate collapse with carpal instability. Timely intervention is essential to preserve wrist function and prevent irreversible joint damage.

**Aim:** this study aims to assess the clinical and radiographic outcomes of radial shortening osteotomy and wedge osteotomy, as joint-preserving surgical treatments in young patients with Lichtman stage II–III Kienböck's disease. The objective is to evaluate mid-term recovery in terms of function, pain, and anatomical stabilization.

**Materials and methods.** Three patients (aged 17, 32, and 42) were diagnosed with Kienböck's disease between 2022 and 2023 and underwent surgical management. Patient 1 (17 years old) had stage IIIb disease; Patient 2 (42 years old), stage II; and Patient 3 (32 years old), stage IIIa, all affecting the dominant right wrist. Preoperative assessment included clinical evaluation, radiographs, and MRI to stage the disease and determine surgical suitability. Indications for surgery included failed conservative management, confirmed negative ulnar variance, and preserved lunate morphology without fragmentation. Surgical intervention involved radial shortening osteotomy in all cases, with a dorsal wedge osteotomy additionally performed in cases with angular deformity or compromised carpal alignment. Standard postoperative rehabilitation was followed, including immobilization and graduated physiotherapy.

**Results and their discussion.** All three patients exhibited significant clinical improvement over the follow-up period of 12 to 24 months. Pain scores reduced substantially, and wrist range of motion and grip strength improved across all cases. Patient 2 demonstrated excellent functional outcomes with a DASH score of 6.66 and a sport-specific DASH of 6.25 at two years postoperatively. Radiographic follow-up showed stabilization or partial revascularization of the lunate, absence of progressive collapse, and preserved carpal height. No complications such as nonunion or hardware irritation were observed. The biomechanical principle of radial shortening—decreasing load transmission through the lunate by altering axial stress distribution—proved effective, particularly in ulnar-negative wrists. Wedge osteotomy further enhanced lunate support and carpal alignment in stage III cases, contributing to improved kinematics and functional outcomes. These procedures offer a joint-sparing alternative to salvage procedures such as proximal row carpectomy or wrist fusion, which may compromise motion in younger patients.

**Conclusion.** Radial shortening osteotomy, with or without adjunct wedge osteotomy, presents a reliable and effective treatment for Kienböck's disease in young and middle-aged patients at stages II and III. By addressing the underlying mechanical etiology and preserving carpal architecture, these procedures offer sustained functional recovery, pain relief, and disease stabilization. Mid-term outcomes are promising, particularly when surgical intervention is undertaken before irreversible lunate collapse. Long-term studies with larger sample sizes are needed to confirm the durability of these outcomes and to further refine surgical indications based on individual wrist biomechanics.