

**MODERN TRENDS IN SURGICAL MANAGEMENT OF  
STAGE III KIENBÖCK'S DISEASE**

*Thesis Submitted for Partial Fulfillment of M.D. Degree in  
**Orthopedic Surgery***

**By**

***Ibrahim Mohamed Mohsen Mahmoud***  
***M.B.B.Ch., M. Sc.***

**Supervised by**

***Prof. Dr. Ahmed Nabawy Morrah***  
***Professor of Orthopedic Surgery***  
***Cairo University***

***Prof. Dr. Yasser El Safoury***  
***Professor of Orthopedic Surgery***  
***Cairo University***

***Prof. Dr. KAMAL SAMY ABD EL MEGUID***  
***Assistant Professor of Orthopedic Surgery***  
***Fayoum University***  
***Faculty of Medicine***  
***Cairo University***

**2009**

# English Summary

## **Modern Trends In Surgical Management of Stage III Kienböck's Disease**

Kienböck's disease is the most common pathological condition that affects the carpal lunate. It is a disorder characterized by progressive sclerosis and collapse of the carpal lunate occurring secondary to avascular necrosis. The disease usually affects and disables the wrist of primarily productive young individuals. The disease is progressive and if left untreated it leads to diminished grip strength, range of motion and ends in eventual arthritis.

Since 1910, when Robert Kienböck had published his classic description of lunatomalacia, neither the etiology nor a reliable treatment for this condition has been established with certainty.

Four stages were described according to radiographic appearance of the lunate, degree of collapse and presence of osteoarthritic changes. This staging system helped in establishment of an algorithm for treatment of Kienböck's disease.

Many surgical procedures were suggested for treatment of Kienböck's disease and they include:

1- Mechanical Approach:

This approach aims at decreasing stresses over the lunate bone allowing indirect revascularization of the lunate. This unloading may be achieved by radial shortening which is the most common procedure performed; but with progression of carpal collapse permanent detour of loads around the lunate via limited inter-carpal fusion is performed.

2- Biological Approach:

Direct revascularization of the lunate through insertion of vascularized pedicled bone graft harvested from the distal radius is also a valuable option.

In this prospective study we managed 25 cases suffering from stage III Kienböck's disease. According to Lichtmann's classification fourteen cases were classified as stage IIIa and eleven cases were classified as stage IIIb.

Pre-operative evaluation included assessment of all patients using wrist arthroscopy for detection of lunate fragmentation and early arthritic changes affecting the radiocarpal joint not detect by routine radiography. Wrist arthroscopy proved to be beneficial in pre-operative assessment as two cases radiographically classified as stage IIIb

revealed ulceration of lunate fossa. They were upstaged to stage IV and excluded from the study.

Operative procedures performed to these cases aimed at combination of both mechanical and biological approaches. For stage IIIa cases radial shortening and revascularization using 4,5 extensor compartment artery (ECA) pedicled graft harvested from the distal radius. While for stage IIIb, scapho-capitate fusion and revascularization was performed. All patients were clinically re-evaluated 24 weeks post-operatively for assessment of function including pain, range of motion and grip power strength. Also radiographic evaluation was performed after 24 weeks for detection of improvement of lunate sclerosis, cystic changes or progression of the disease.

Also follow-up magnetic resonance imaging was performed to 15 patients (60%) in this series after 17.2 months in average (range between 8 months and 40 months) and revealed improvement in signal intensity of lunate in T 2 +/- T1 weighted images denoting revascularization of lunate in 13 cases (86.6%).

Early results are promising according to scoring systems based on clinical and radiological parameters. Longer follow-up studies are needed for proper assessment of this combination of approaches which presents a valuable solution for Kienböck's disease.