



## **Kienböck's disease stage II in an adolescent with benign outcome**

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### **Abstract**

We describe a 13-year old female patient with Kienboeck's disease stage II according to Lichtmann who was treated only by rest and calcitonin substitution. The symptoms disappeared completely after 9 months and have not recurred for more than 2 years.



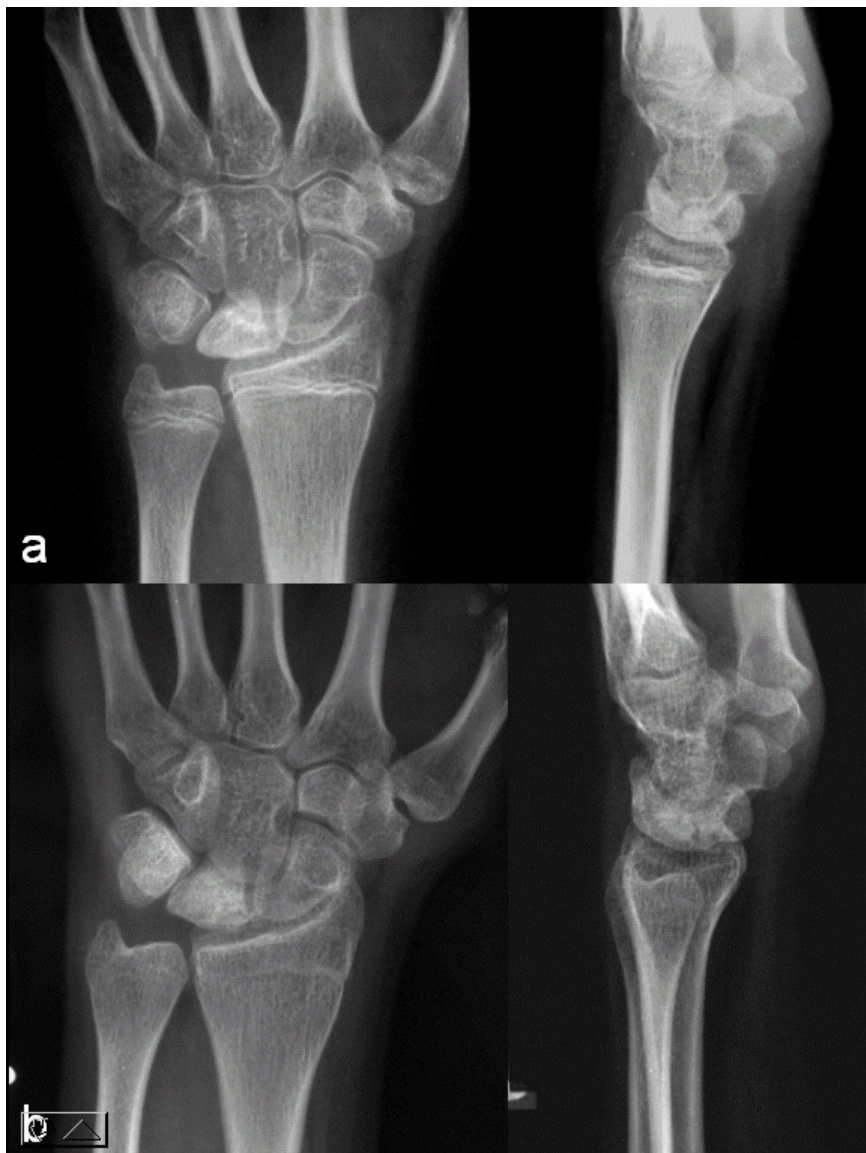
## **Introduction**

The etiology as well as the treatment of Kienböck's disease [9] remains controversial.

Repetitive trauma [1, 2, 4, 20], individual vascularity [1, 6] of the lunate and length differences between the radius and ulna (ulnar minus variance) were considered [1, 6, 20] to lead to avascular necrosis. Operative treatments such as ulnar lengthening [3, 4, 18], radial shortening [1, 4, 12, 13, 17, 21, 23], and different [12, 13, 23] radial osteotomies have been performed with good results. Illaramendi [8] introduced metaphyseal core decompression of the distal radius to decrease intraosseous venous pressure of the lunate. We describe an adolescent patient with Kienböck's disease who's signs and symptoms disappeared without operative intervention. A similar case has been described only once before [5].

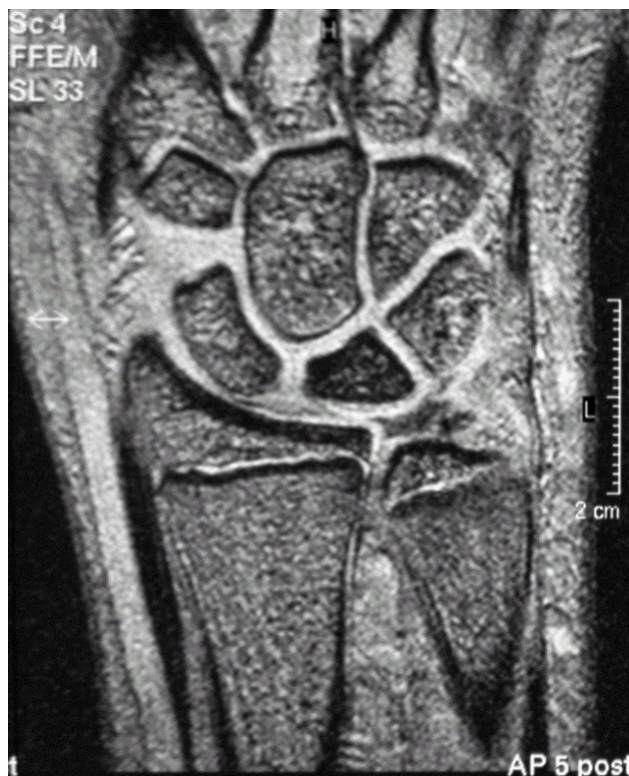
## *Case story*

A 13 year old female patient presented to the general practitioner with four weeks of pain in the left wrist during and after physical activity. No trauma history was recorded. Two months later the patient was referred to the orthopaedic department due to an increase of pain and deterioration of range of motion. Radiographs showed sclerosis and slight deformation of the lunate (Kienböck's disease) stage II according to Lichtmann [11] (Fig. 1). MRI showed a markedly decreased vascularity and irregularity of the lunate joint surfaces (Fig. 2). The treatment consisted of immobilisation of the wrist and application of calcitonin nasal spray. One month later the symptoms had decreased and the splint was removed. The calcitonin substitution was stopped after three months when pain was almost absent and the range of motion similar to that of the opposite wrist. Nine months after the initial symptoms the patient was completely free of pain.



**Fig. 1** *a: Initial radiograph (a) showing sclerosis and slight deformation of the lunate - Kienboeck's disease stage II (Lichtmann). b: Radiographs 2 years and 3 months after onset showing decreasing sclerosis without further deformation.*

At the latest follow up 27 months after onset radiographs showed decreasing sclerosis without further deformation. An initial ulnar minus variance (Fig. 1) of  $-2.5$  mm had changed to  $+1.0$  mm (Fig. 1). Range of motion (Fig. 3) and strength was comparable to those of the opposite side.



**Fig. 2:** MRI showing decreased vascularity and irregular joint surfaces of the lunate.



**Fig. 3:** Range of motion 27 months after onset showing no differences compared to the opposite side.



## **Discussion**

Surgical treatment of Kienböck's disease shows diminution of pain in 75-100% of cases, restoration of range of motion in 70 - 80% and of strength in 60-85%. The results do not differ substantially between the different operative techniques [1, 12, 13, 17, 18, 21, 22, 24]. A similar case of a 7 year old child with Kienböck's disease [5], regained full function after three years and the radiological signs of osteonecrosis disappeared completely. Our patient had no pain 2 years and 3 months after the onset and regained full range of motion and strength compared to the opposite side. A further cases with Kienböck's disease in an 8 year old child was described by [10] Leiber and Olbrich, however without comments on the outcome. A third case of a 9 year old child with a late stage of Kienböck's disease was described by [19] Schinz et al. also without comments on the outcome.

It was noted that an initial ulna minus variance equalized during the 2 years of observation by 3.5 mm. The growth of the bones of the upper extremity has been investigated concerning the relation of the ulna and radius [14-16]. Serial radiographs were made at 6 month interval in 244 subjects from 7 to 15 years to determine skeletal maturation. It was found that the distal radial-ulnar growth plate difference (ulnar minus variance) is 6mm at the age of 5 years in girls (7 years in boys), decreasing to zero at age 13 (boys 15 years) [16]. Our patient, however still had a correction of 3.5 mm between the age of 13 and 15 years. According to the scales of [7] Greulich and Pyle she had a skeletal age of 13 years at the onset of the disease. The fact that the ulnar minus variance disappeared may have led to the same effect as shortening of the radius or lengthening of the ulna.



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