

Intraosseous Ganglion Cyst of the Lunate; The Pseudo Kienbock Lesion

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ABSTRACT

Intraosseous ganglion cyst of the lunate represents a rare phenomenon and when present they are rarely symptomatic. Symptomatic cyst usually present with diffuse dorsal wrist pain or ulnar sided wrist pain and mimic Kienbock disease. There have also been case reports of extensor tendon injury due to pathological fractures of the lunate secondary to intraosseous ganglion cyst. Radiologically the entity is usually distinguishable from kienbock disease and its differential diagnoses. Although the clinical presentations are similar having detailed knowledge of the radiological features will avoid diagnostic pitfalls.

Keywords: Intraosseous cyst, intraosseous ganglion, pseudo Kienbocks disease, wrist pain

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INTRODUCTION

Kienbock's Disease was first described by the Austrian radiologist, Robert Keinbock, in 1910. It represents osteonecrosis of the lunate by an avascular phenomenon but the underlying aetiology remains unknown. It classically presents as atraumatic wrist pain, which is usually localized dorsally with vague tenderness over the lunate. A number of other wrist pathologies may have a similar presentation with only subtle differences, the so called pseudo kienbock's lesion. Symptomatic intraosseous ganglion represents a rare but important differential. A case of symptomatic intraosseous ganglion is presented below highlighting differentiating features.

CASE

A 28-year-old right hand dominant chef presented to the out-patient department with an eight-month history of atraumatic left wrist pain. The pain was localized to the dorso-radial aspect of the wrist and was worsened with loading of the wrist. Examination findings revealed vague tenderness over the scapholunate interval. Watson's test and lunotriquetral ballottement were negative. Plain radiographs done revealed a cyst with sclerotic margins within the radial side of the lunate (Fig. 1).



Fig 1. Plain radiographs, AP and lateral views showing radial sided cystic lesion in the lunate.

He had been previously seen in another institution and had magnetic resonance imaging (MRI) of his wrist. He had been diagnosed as having Kienbock's disease and started on conservative treatment. His pain had not settled and he sought a second opinion in our institution. On review of his MRI images a radial sided lesion with low signal intensity on T1 and high signal intensity on T2 was appreciated. The T2 image also revealed communication of the lesion with the scapholunate ligament (Fig. 3).



Figure 2. MRI of left wrist, T1 and T2 weighted images showing radial sided intraosseous ganglion cyst of the lunate.

A diagnosis of symptomatic ganglion cyst of the lunate was made and operative intervention in the form of cyst excision and bone grafting was undertaken. The wrist was approached through a dorsal incision centered over the lunate. A defect in the lunate was visualized with extension into the scapholunate ligaments and a gelatinous material was seen with inadvertent rupture during excision. The cavity was curetted and packed with bone graft. His postoperative

period was uneventful. Incorporation of the bone graft was achieved at two months post operatively and he was symptom free at his six-month follow-up outpatient visit.

DISCUSSION

The term intraosseous ganglion was first coined by Crabbe *et al* in 1966 (1, 2). It most commonly affects the femoral head and medial malleolus. Loco-regionally it is usually seen in regions of the hip, knee and ankle (3). Approximately, a fifth of cases affect the carpal bones, the lunate being most commonly affected. The other carpal bones are less frequently involved but the capitate is the next most frequently affected carpal bone followed by the scaphoid and triquetrum (3). Intraosseous ganglion of the lunate like its scaphoid counterpart tends to occur eccentrically towards the scapholunate junction. The pathogenesis remains elusive but several theories exist. These include synovial herniation, mucoid degeneration, proliferation of synovial rest, benign neoplasia and metaplasia (4–8).

The histology is identical to periarticular and paratendinous ganglions *ie* soft-tissue ganglion and the underlying aetiology or pathogenesis is thought to be similar (9).

Schajowicz *et al* differentiated between a penetrating and a *de novo* type. The penetrating type was thought to arise from a neighboring soft-tissue ganglion with penetration and subsequent intraosseous incorporation. The *de novo* type had no obvious extraosseous extension or communication and was thought to originate intraosseously (6).

The clinical presentation of intraosseous ganglion is wide and varied. The majority are incidental findings and the patient may remain asymptomatic (10). In a small subset there may be chronic wrist pain often confined to the dorsum of the wrist in the region of the scapholunate

ligament (10). There have also been case reports of spontaneous rupture of the flexor tendons due to pathological fractures of the lunate secondary to an intraosseous ganglion (11).

Investigation is usually commenced with plain radiographs. The characteristic finding is a well-circumscribed osteolytic lesion eccentrically located on the scaphoid border of the lunate (12). There is usually a thin sclerotic rim with no expansion of the cortex (12). The joint space are usually preserved with absence of subchondral sclerosis which helps to differentiate it from degenerative cysts (3). Isotope bone scanning usually shows increased uptake in symptomatic intraosseous cyst of the carpal bones and may be a useful investigation in differentiating incidental cyst from symptomatic cyst.

Magnetic resonance imaging as per index case will reveal low signal intensity on T1 and increased signal intensity on T2 weighted images. T2 weighted images may also show an extraosseous extension.

Its nonspecific presentation and radiographic features bears similarities to other afflictions of the lunate and thus the diagnosis may be misinterpreted as in the index case. The differentials include bone tumours (chondroblastoma, osteoblastoma, osteoid osteoma, enchondroma, fibrous dysplasia, chondromixoid fibroma and giant cell tumour), Kienbock's disease or one of the entities that fall under the umbrella of "Pseudo-Kienbock's disease *ie* acute fractures, infantile and juvenile lunatomalacia, ulnar- side wrist impaction syndrome and arthritis (13). Differentiation of an intraosseous ganglion cyst of the lunate radiologically from a bone tumour is usually evident on plain films or computerized tomography (CT). Absence of calcification within the lesion usually helps to differentiate ganglion cysts of the lunate from chondroblastoma, osteoid osteoma, osteoblastoma and enchondroma. Giant cell tumour usually has an ill-defined border while intraosseous ganglion cyst presents as a lesion with

well-defined sclerotic margins. Differentiation from Kienbock's disease or other pseudo Kienbock lesion is usually done by a combination of the radiographic location and MRI findings. Kienbock's disease tends to be a pan-ossseous phenomenon and radiological findings are usually in keeping with such. Intraosseous ganglion cyst of the lunate on the other hand tends to affect the radial side of the lunate with cystic features on MRI. Ulnar-side wrist impaction syndrome occurs typically on the ulnar side of the lunate in ulnar positive patients (14). Infantile and juvenile lunatomalacia are identical to Kienbock's disease but occurring in a different age group and with a better prognosis *ie* with a natural history of resolution with conservative treatment (15). Degenerative and rheumatoid arthritis usually show degenerative features in the cartilage. Although similar in presentation intraosseous ganglion cyst of the lunate can usually be differentiated by radiological means from Kienbock's disease or other pseudo Kienbock lesions.

CONCLUSION

The radiological features of Kienbock's disease bear several similarities with other pathologies of the wrist including intraosseous ganglion cyst of the lunate. As a result of this, these less recognized conditions maybe misdiagnosed as Kienbock's disease. Differentiation is essential as management options vary.

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