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A case report of lunate excision with scapho-capitate arthrodesis in Kienbock's disease

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Abstract

Case study of a 22-year female presented to our clinic with complaints of dorsal wrist pain, swelling and stiffness with decreased motion at left wrist joint with a duration of 2 months without any significant traumatic history. On evaluation dorsal wrist pain and point tenderness over lunate bone was present. Radiographs and Advanced imaging MRI was suggestive of Kienbock's disease. This was treated with Lunate excision and scapho-capitate arthrodesis along with bone grafting. Advanced stages of Kienbock's are usually managed by Wrist fusion or proximal row carpectomy. We are reporting our result of scapho-capitate arthrodesis which was performed to stop progression of carpal collapse and carpal-ular translation and thereby preserve functional motion and provide pain relief.

Keywords: Kienbock's disease, scapho-capitate arthrodesis, lichtman classification

Introduction

Kienbock's disease is osteonecrosis of lunate [1] with an unknown aetiology usually affects young adults. Based on the classification of the Kienbock's disease by Lichtman the severe forms; Stage IV of Kienbock's are treated with proximal row carpectomy and wrist fusion [2]. As the avascular necrosis leads to loss of lunate height further causing migration of capitate and collapse of central column leading to radioscaphoid articulation degeneration [3]. We report our case of Single joint fusion i.e. Scapho Capitate fusion, which is a less invasive and joint motion preserving technique as compared to the Proximal Row Carpectomy and Wrist Fusion [4].

Materials and Methods

Case study: Patient presented in our clinic with the primary symptom of left wrist pain since 2 months was aggravated with movement at the wrist joint. There was no history of any trauma. On Clinical evaluation, localised swelling over the wrist was documented, there was tenderness over the wrist joint and restricted flexion and extension at the wrist joint was documented. Radiographs were suggestive of sclerosis of lunate with decrease in height of lunate and degenerative changes around the wrist joint. MRI was suggestive of Sclerosis with marrow oedema and collapse of the lunate bone. Focal full thickness chondral loss involving the articular surface of the distal radius and capitate suggestive of early secondary degenerative changes. Extensor carpi ulnaris subluxated from the ulnar notch and perched onto the ulnar styloid process.

Patient was treated with Single joint fusion i.e. Scapho Capitate Arthrodesis SCA [5] through the dorsal longitudinal incision over the wrist. Through the interval between the 3rd and 4th extensor compartment, lunate was excised and scapho-capitate joint was denuded and fusion was performed and fixed with a Herbert Screw and a 1.8 mm Kirschner wire with cancellous bone graft harvested from the ipsilateral radius. Patient was immobilised in a Below Elbow splint for 6 weeks postoperatively. At 6 weeks the K-wire was removed and therapy with gradual range of motion (ROM) was started. Patient regained full ROM within 3 weeks and had no symptoms. At 1 year follow up radiographs showed good scapho capitate fusion with the screw in situ and the radioscaphoid articulation did not show any degenerative changes. Functional evaluation was performed pre and post operatively at 1 year follow up. The scores preoperatively were as follows: Disability of Arm, Shoulder and Hand Score (DASH) [6].

46, Patient-rated wrist evaluation (PRWE): 79 and Mayo Wrist score: 45. At 1 year follow up the scores improved and were as follows DASH score: 20, PRWE score-3 and Mayo wrist score - 85. Images pending (only pre op X-ray MRI film immediate post op final X-ray).

Discussion

As per the Lichtman's classification, the advanced stage i.e. Stage 4 Kienbock's disease can be treated with Wrist fusion, Proximal row carpectomy and limited carpal fusion [1]. The rationale for treatment of SC Arthrodesis concurs with the concept of Scaphotrapeziotrapezoid (STT) arthrodesis popularized by Watson *et al.* [7, 8]. Both STT and SC Arthrodesis aims to stop progression of carpal collapse and carpal-ulnar translation in order to preserve functional motion and provide pain relief [9]. In the STT fusion method we have to fuse 2 joints and it is more complex than scapho-capitate fusion in which a single joint has to be fused, in our case study we have done SCA. This method provides very good results by decreasing the pain significantly, preserving wrist mobility and increasing grip strength.

There is controversy whether to preserve the lunate or excise it as it may cause collapse and the results are comparable to other reported techniques. We however did excise the lunate and our patient has not had any collapse or pain at 1 year follow up. The ROM of wrist after lunate excision and SCA we had comparable results [10] also on comparing the ROM with PRC and limited wrist fusion the authors suggest that the later has better ROM [11].



Fig 1: Preoperative radiographs showing osteonecrosis of lunate



Fig 2: Postoperative radiograph of lunate excision and SCA and its fixation



Fig 3: Follow up radiograph at 1 year



Fig 4: ROM at 1 year follow up

Conclusion

The SCA or limited carpal fusion can be considered as an option in Grade 4 Lichtman osteonecrosis of Lunate. Limited carpal fusion with bone graft leads to minimal tissue trauma and good postoperative ROM. We report a good functional outcome in our case with limited carpal fusion i.e. Scaphocapitate Arthrodesis and lunate excision.

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