

Case Report

Radius-ulna shaft fracture with distal radioulnar joint instability in a case of ipsilateral malunited colles fracture: a case report

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ABSTRACT

Malunion of the distal end of radius is a known consequence of the conservative management. The functional impairment depends on the severity of the deformity and it can be associated with distal radioulnar joint (DRUJ) instability. Subsequent radius ulna fracture in an elderly osteoporotic patient is a challenging task to manage. A 60 year old female patient came with radius ulna shaft fracture with DRUJ instability with ipsilateral malunited distal radius fracture. We managed with open reduction and internal fixation using 3.5 mm locking compression plate (LCP) with ulnar shortening and K wires for DRUJ. At one year, follow-up, patient is having good clinical and radiological outcome without any complications. Radius ulna shaft fracture in cases of malunited colles fracture with positive ulnar variance with DRUJ instability can be managed well with open reduction and internal fixation of radius-ulna shaft which provides stable fixation, ulnar shortening at the fracture site to maintain the neutral/negative ulnar variance and DRUJ fixation using K wires. Use of multiple vicryl sutures to tie the plate to the bone gives additional stability in osteoporotic bones till the fracture unites and prevents implant failure. Combination of the above mentioned procedures helps in getting good functional outcome in elderly osteoporotic patients.

Keywords: Malunited colles, DRUJ instability, Radius ulna shaft fracture

INTRODUCTION

Distal end radius fracture is common in elderly individuals because of osteoporosis, Malunion is one of the most common complication of distal end radius fractures and significant malunion can lead to considerable disability and affects the functional outcome.¹ The distal end radius fractures can be associated with ulnar styloid fractures or associated DRUJ instability. The malunited distal radius fracture can leads to positive ulnar variance, which causes ulnar impaction and functional disability. The associated radius ulna shaft fractures are but can happen in elderly patients because of osteoporosis. Fracture pattern, amount of comminution, severity of soft tissue injury, stability of the fixation and post-operative physiotherapy which all are interconnected in relation to the final functional

outcome.² Malunion of the distal end of radius is a recognized cause of suboptimal wrist and forearm functions.³ The objective and subjective symptoms of the malunion differ from patient to patient requiring appropriate management for the same. Also, the advances in the understanding of the biomechanics of the hand-wrist-forearm has led to improved functional outcomes in patients treated with surgical intervention for malunion.⁴ We present a case of radius ulna shaft fracture with ipsilateral malunited colles fracture with DRUJ instability in an elderly female patient, managed with open reduction and internal fixation and DRUJ stabilization.

CASE REPORT

A 60 year old female patient came with complaints of pain, swelling and deformity in the left forearm. Patient

had a history of fall at home. Patient was a known case of hypertension and diabetes on medications. On examination swelling, tenderness and deformity was present in left forearm along with deformity with no tenderness at the wrist. There was no distal neurovascular deficit. X-ray of the left wrist with forearm AP and lateral views showed malunited extra articular distal radius fracture (colles fracture) with radius ulna fracture with positive ulnar variance (Figure 1). As the patient had radius ulna shaft fracture with DRUJ instability, we planned for open reduction and internal fixation with DRUJ stabilisation.



Figure 1: Preoperative wrist and forearm X-ray showing malunited colles fracture, radius ulna shaft fracture with positive ulnar variance.

Patient was operated in supine position under GA using tourniquet. Initially ulna exposure was done, then the radius. Ulnar incision was taken directly over the subcutaneous ulnar border, deep dissection was done between flexor and extensor carpi ulnaris muscle. Radius was exposed using volar approach. As the patient was not severely disabled and the wrist function was fairly good before the trauma because of malunited DER fracture as per the patient and the patient wanted surgery for only the radius ulna shaft fracture, we have done internal fixation for radius shaft and ulna shaft fracture using 3.5 LCP. After the radius fixation (Figure 2), ulnar variance was positive (Figure 3), to bring the ulnar variance to negative and to prevent ulnar impaction, we had shortened the ulna at the fracture site of about 0.5 cm (Figure 4) and fixed the ulna using 3.5 mm LCP. The DRUJ instability was managed with two k wires passed from ulna to the radius. As the patient was old and osteoporotic, the screws were not getting adequate purchase. To prevent the implant failure, additional stability was given by tying the vicryl suture to the plate (Figure 5) and the wound was closed in layers. Post-operative X-ray showed adequate compression and alignment at the fracture site with proper maintenance of ulnar variance and DRUJ (Figure 6).

Above elbow slab was given till four weeks, DRUJ k wires were removed at four weeks and then gradual mobilization was started. At present one year follow-up, the patient is having good clinical and radiological outcome without any implant failure or any other complications.



Figure 2: Radius shaft fracture fixation using 3.5 mm LCP.



Figure 3: Intraoperative c-arm image showing the positive ulnar variance after radius shaft fixation.

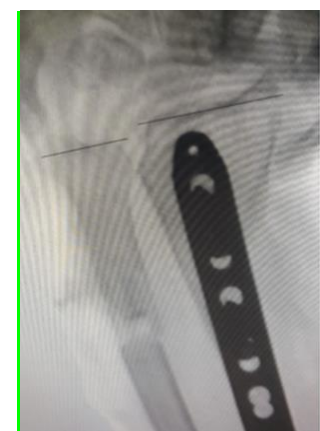


Figure 4: Intraoperative c-arm image showing the negative ulnar variance after the ulnar shortening.



Figure 5: Ulnar shortening and fixation using LCP, use of vicryl suture for additional stability of the implant and k wire fixation for DRUJ instability.



Figure 6: Post-operative X-ray showing the compression at the fracture site with maintenance good alignment, ulnar variance and DRUJ.

DISCUSSION

The management of elderly patients with osteoporosis with radius ulna shaft fracture with malunited colles with DRUJ instability is a challenging to the operating surgeon. Not all the malunited distal radius fractures requires surgery, most of the patients can be managed conservatively with physiotherapy and lifestyle modifications. The need for operative procedures designed for malunited distal end radius fractures more so in patients with significant disability and symptoms has long been recognized. The indications of current day practice include pain and limitation of movements at the wrist joint, forearm and functional disability. The relationship between the accuracy of anatomical reduction and the eventual functional outcome is fairly proportional.⁵ In this case, the patient had good wrist function even with malunited colles and patient also did not want the surgery for the old fracture, so we operated only radius and ulna shaft fracture.

A distal radial fracture nonunion should be suspected clinically if there is continuing pain after remobilization of the wrist with an advancing deformity. The pain is related to use of the hand and shows no sign of

improvement, but the non union of distal radius is rare as it is the metaphyseal area.⁵ The surgeon evaluating and treating the malunited fractures should be familiar with the biomechanics, anatomy and proper pre-operative planning along with details of the osteotomy to be performed should be made before taking the patient up for surgery.⁶

The radius ulna shaft fracture in elderly patient can be managed by conservative and surgical methods. Conservative method can lead to delayed union or non union if not properly reduced and immobilized. Surgical options are use of intramedullary nail or plating. Plating helps in stable fixation and early mobilization. Getting screw purchase is difficult in osteoporotic bones, tying of plate with vicryl suture helps in getting additional support till the fracture heals.

The malunited radius with shortening is associated with DRUJ disfunction and ulnar variance differences, which can cause functional impairment. Surgery in the ulna is usually necessary to prevent these problems.⁷ The same thing was done in our case that is, shortening of the ulna to maintain the ulnar variance. There are so many types of ulnar shortening osteotomy, which helps to reduce the ulnar sided wrist pain. Only ulnar shortening is required in mild angular deformity of distal radius. Both ulnar shortening and distal radius malunion correction required in severe angular deformities⁸. As our patient had ulnar fracture and mild angular deformity of the distal radius, we managed with ulnar shortening only at the fracture site.

CONCLUSION

Radius ulna shaft fracture in cases of malunited colles fracture with positive ulnar variance with DRUJ instability can be managed well with open reduction and internal fixation of radius-ulna shaft which provides stable fixation, ulnar shortening at the fracture site to maintain the neutral/negative ulnar variance and DRUJ fixation using K wires. Use of multiple vicryl sutures to tie the plate to the bone gives additional stability in osteoporotic bones till the fracture unites and prevents implant failure. Combination of the above mentioned procedures helps in getting good functional outcome in elderly osteoporotic patients.

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