Open Reduction & Internal Fixation of a Distal Radius Fracture With a Volar Locking Plate: A Case Report

Abstract

The present case report describe Open Reduction & Internal Fixation of a Distal Radius Fracture With a Volar Locking Plate. Anatomical reduction & stable fixation of fracture with or without bone grafting, greatly reduces the incidence of post-traumatic osteoarthritis & stiffness. The accuracy of fracture reduction co- relates directly to the final outcome. A 34-year-old man fell on his right outstretched h&. He presented to the casuality & on physical examination, he was noted to have deformity about his right wrist with moderate swelling. There was no neuro-vascular deficit. Various treatment modalities have been developed for distal radius fracture fixation. Treatment options range from closed reduction & cast application to open reduction with plates & screws. Locking plates address intra-articular & metaphyseal comminution. Biomechanical studies comparing volar fixed- angle locking plates with that of conventional dorsal plates report volar fixed-angled plates to be superior in terms of their strength.

Keywords: Treatment modalities, post-traumatic osteoarthritis, stiffness, metaphyseal comminution

INTRODUCTION

Fracture of the distal radius are one of the most common fracture of the upper limb accounting for 16-20% of all fractures [1,2]. Due to high rate of complications such as mal-union, subluxation/dislocation of distal radio-ulnar joint or late collapse of fracture, poor functional & cosmetic outcome with procedures like closed reduction & cast immobilization, ligament-taxis with external fixator & per-cutaneous pin fixation are no longer acceptable.

Anatomical reduction & stable fixation of fracture with or without bone grafting, greatly reduces the incidence of post-traumatic osteoarthritis & stiffness. The accuracy of fracture reduction co-relates directly to the final outcome [3,4,5]. The advantages of plate osteo-synthesis are accurate fracture reduction, stable fixation, possibility of immediate post-operative mobilization & early return to the function [6,7]. With the advent of Locking Compression Plate (LCP), the bone fragments can be held together in place even after union to prevent secondary displacement of unstable fractures.

CASE REPORT

A 34-year-old man fell on his right outstretched h&. He presented to the casuality & on physical examination, he was noted to have deformity about his right wrist with moderate swelling. There was no neuro-vascular deficit. His presenting radiographs are seen in Figure 1. He was noted to have a minimally displaced extra-articular distal radius fracture with mild volar-comminution on his radiographs. Fracture alignment was felt to be acceptable, & did not require a reduction. He was treated with a below elbow slab & arm pouch .

The patient's radiographs at 10 days post injury demonstrated worsening alignment with the radial inclination decreased & dorsal tilt increased to 25 degrees (Fig. 2). This was determined to be unacceptable alignment, & was advised to undergo surgery for ORIF with a volar locking plate.

FIGURE 1. A & B, AP & lateral radiographs demonstrating minimal deformity

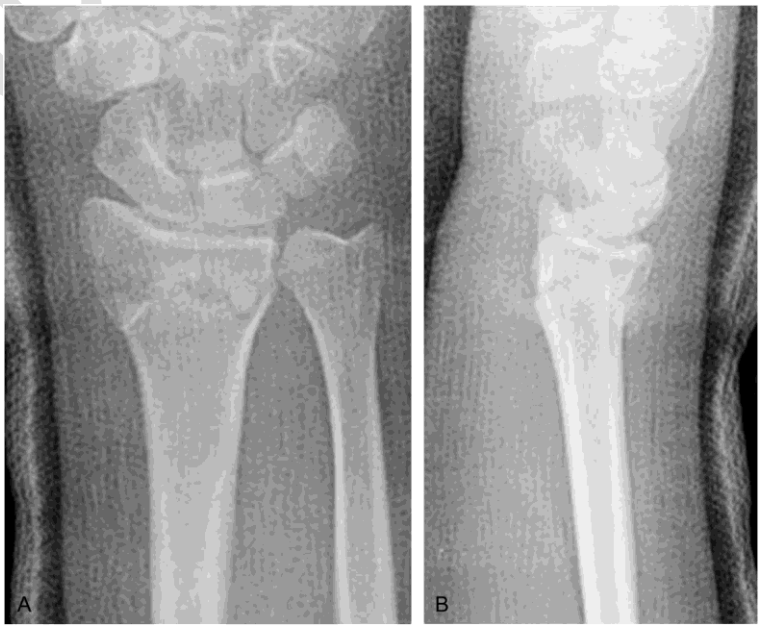

FIGURE 2. A & B, Anteroposterior & lateral radio- graphs at 10 days post injury with worsening alignment

The surgery was performed through a volar Henry approach & adequate reduction was obtained, a volar locking plate was applied & final fracture reduction was satisfactory. Postoperatively, he was treated with wrist brace & instructed to work on finger active range of motion (ROM) & pronation & supination. The brace was discontinued at 6 weeks postoperatively at which time he was allowed use as tolerated. No therapy was needed, & he regained near normal ROM. At 7 months postoperatively, the patient was pain free & had normal ROM (Fig. 3)

FIGURE 3. A & B, Anteroposterior & lateral radiographs at 7 months

DISCUSSION:

This case presents the treatment of a patient with an extra- articular distal radius fracture that was initially non displaced & treated with a below elbow slab. Within 10 days after the injury, the fracture went on to displace & required ORIF. The initial treatment was appropriate, but the fracture was unstable as demonstrated by the displacement on follow-up.

Various treatment modalities have been developed for distal radius fracture fixation. Treatment options range from closed reduction & cast application to open reduction with plates & screws. Plating allows direct visualization of fracture fragments & restoration of the anatomy, decreased morbidity by allowing early mobilization, & early return of wrist function. Locking plates address intra-articular & metaphyseal comminution. Biomechanical studies comparing volar fixed- angle locking plates with that of conventional dorsal plates report volar fixed-angled

plates to be superior in terms of their strength. Dorsal plating of distal radius has not garnered much popularity due to fact that, inspite of dorsal plating, the volar collapse of fracture occurred [8]. Complications seen with plating include risk of infection, tendon irritation or rupture. These may warrant implant removal in some cases.

CONCLUSION

Treatment methods of the distal radius fractures remains controversial topic due to the lack of good studies comparing other modality of treatments. When operative fixation is indicated, volar locked plating of distal radius fractures may be good treatment option**.**

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