



## Case Report

## Physiotherapy rehabilitation of distal radial fracture to enhance the activity of daily living

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### ABSTRACT

Fracture of distal radius is the commonest fracture present in the upper limb. In fact, it is most commonly treated by the doctor. An outstretched hand is the most common cause of distal radius or wrist fractures. The fracture of distal radius can also lead to nerve injury mostly median nerve. Physical Therapy plays important role which provides positive effect in treating post fracture cases. A case of 45 years female is presented in this report who had an fall over right wrist joint and diagnosed with distal radius fracture and operated conservatively results into pain over wrist joint, decrease in physical activities. Rehabilitation protocol is explained below in the report. We report that there were improvement in patient outcomes level increases in muscles strength, provide pain relief and improvement in patient functional Independence.

**Keywords:** Distal Radial Fracture, Activity of daily living, Physiotherapy, Rehabilitation.

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### INTRODUCTION

Distal radial fracture may occur before hip and spinal fractures in one's life span and it is first sign of osteoporosis. Both distal radius and olecranon fractures having incidence of 11.5 per 100.000 and 26 per 10.000 individuals per year, respectively [1][2]. All distal radial fractures are confirmed by radiography. Osteoporosis is a risk factor for both men and women distal radial fractures. The prevalence of osteoporosis is 34% in female and 17% in male patients. Osteopenia and Osteoporosis significantly associated with radial fracture in men. In the elderly patients, the fracture can be treated with a number of operative and non-operative treatments. Not surprisingly, we found the rate of distal radial fracture is higher in women than men. Distal radial fracture shows significant racial discrepancy. DRUJ injuries can occur alone or in conjugation with distal radial fracture. These can manifest as acute or chronic instabilities or painful arthritis. The diagnosis and treatment of these injuries necessitate a thorough understanding of anatomy as well as clinical findings [3].

Distal Radial fracture is one of the most common type of fracture, such that, 640,000 patients were reported in 2001 in USA itself. After analysing Chung and Spilson used data from the National Hospital Ambulatory Medical Survey (NHAMCS) database that determined that hand and wrist fracture accounted for almost 1.5% of emergency visits [4].

### Patient information

We present a case of 45 years old female patient with right hand dominance, visited to orthopedic department and advice rehabilitation because of complaint of pain over wrist, elbow joint. Patient had an history of fall with result into injury over distal forearm. Patient visited to orthopedic where investigation and assessment were done and diagnosed with distal radial fracture. For fracture she was treated conservatively and below elbow slab was given. She visited to physiotherapy for rehab after removal of the slab. Patient stated that she had complaint over right wrist, elbow which was dull aching in nature aggregate on activity and relieve at rest more at night with intensity on NPRS at rest 3/10 on activity NPRS 7/10 with decrease in range of motion of wrist joint there by result into decrease in performing activities of daily living.

### Clinical Finding

After taking consent form the patient proper examination were done in sitting position. On inspection patient keeps right shoulder adducted, elbow pronated slightly flexed, wrist flexed with fingers flexed. There were presence of scar at distal forearm along with wasting of muscles. On palpation, the localized temperature were raised, tenderness were present with grade 2, and the length of scar were approximately 6 cm. There were normal sensations and reflexes.

**Treatment****Week 1**

Thermotherapy was advised to the patient initially. Hydrocollator packs were given for 10-15 minutes which plays important role in relaxing the muscles. Transcutaneous electrical nerve stimulation was applied with four poles 10 minutes which helps in reducing pain. Active assisted range of motion exercises for wrist joint, elbow joint and shoulder joint were started including fingers movement for 10 to 20 repetitions twice a day.

**Week 2-4**

Ultrasound was advised in a continuous mode 3 MHz for 7 minutes. All joint assisted range of motion exercises were continued with progression in repetitions. Maitland Joint mobilization was started with grade 3 and 4 followed by cold pack for 5 minutes. Electrical muscles stimulation was also given with intermediate galvanic current with intensity depend on patient capacity of tolerance for 30- 50 repetitions.

**Week 5-8**

Hot pack and range of motion exercises were continued. Joint mobilization were continued followed by stretching with hold for 30 seconds. Strengthening exercises were started for shoulder joint and elbow joint. Resistance were added manually as well as mechanically with 15 repetitions twice in a day. Electrical Muscles Stimulation was continue with faradic current for re-education.

**Week 8-12**

Resisted Exercises were started for wrist joint applying with mechanical resistance devices like weight cuffs, therabands, dumb bells for 15-20 repetitions. Strengthening exercises for shoulder and elbow joint was also continue followed by stretching with 30 seconds hold.

**Follow up and outcomes**

After giving proper rehabilitation to the patient there was improvement in pain parameters (NPRS- 3/10) muscles strength of the patient was improved shown in table no 1. Range of motion of the joints were increased shown in table no 2. Patient Specific functional score is 7/10.

Table 1. Range of motion of upper extremity pre and post assessment

Assessment	Pre assessment	Pre assessment	Post assessment	Post assessment
	Active	Passive	Active	Passive
Wrist flexion	0-10	0-14	0-66	0-68
Extension	0-17	0-20	0-71	0-75
Radial deviation	0-1	0-4	0-15	0-18
Ulnar deviation	0-7	0-9	0-29	0-33

Table 2. Manual Muscles Testing of upper extremity pre and post assessment

Assessment	Pre assessment	Pre assessment	Post assessment	Post assessment
	active	passive	active	passive
Wrist flexion	-1/5	1/5	4/5	+4 / 5
Extention	1/5	2/5	3/5	+3/5
Radial deviation	0	1/5	2/5	4/5
Ulnar deviation	0	1/5	3/5	3/5

**DISCUSSION**

Mostly, distal radial fracture associated with elbow dislocation rather than the proximal radial fracture. Because distal

radial fracture, reduces axial pressure applied to the radius. In children and adults, the most common fractures noted were distal and proximal radial fractures. In hospitals, distal radial fracture is responsible for 14 % of other extremity injuries as well as 17% of fractures were treated in emergencies [5][6]. A case of 52 year old female was reported by nataya. et.al [7]. Distal radial fracture can be treated by external fixation and also bone grafting rarely waters [8] and Bado similarly noted injury in children. In our patient main complaint was pain while rest and unbearable in motion. Because of pain, range of motion also gets reduced. The X-ray findings confirmed the diagnosis. Our main concern was to treat the fracture. Then concentrate on the range of motion.

There are various causes of wrist fracture. Skeletal injury in blunt trauma remains one of the long-term impairment among youth [9]. That is falling into an outstretched hand is one of the most common cause, sports injuries and crashes. Wear sensible shoes, remove things that trip you up in your home such as carpets, glow up your living room, have your eyes examined and corrected if necessary, install hand rails in your bathroom, install railings on your stair case, and avoid tricky surface areas to avoid common injuries. You may have heard about this sentence "Prevention is better than cure".

The Ballotement test, Radius pull test, Clunk test, extensor carpi ulnaris (ECU) test, and Press test have all been characterized as physical tests for the diagnosis of DRUJ instability [10]. Ballotement test is the most reliable physical examination test for DRUJ instability [11]. In some cases, nonsurgical treatment for chronic distal radioulnar joint instability is an option. Functional bracing is considered primary treatment in certain patients [12]. Once the bone injuries have healed, soft tissue damage are taken into account. Electrical muscle stimulation was given to the affected muscle (current type- Intermittent Galvanic) to facilitate muscle re-education [13]. Some patients who have other fracture along with radial like hip, knee etc. can delay the treatment due to long term bed rest and fatigue.

Figure 1: X ray showing fracture at distal end of fracture



Fracture of joints result into decrease in physical activity. The present case report is of distal radius fracture. Following 12 weeks of rehabilitation there was decrease in pain, improvement in muscles strength, increased in range of motion through proper rehabilitation protocol which includes electrotherapy, strengthening exercises and other conventional techniques. This case report emphasis the structure physical therapy program in distal radius fracture to attain the recovery of the patient.

#### Competing interests

The authors declare no competing interest.

#### Authors' contributions

All authors contributed equally.

#### Declaration of patient consent

The authors certify that appropriate consent forms were obtained from the patient for preparing the case report.

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