

## DESCRIPTIVE STUDY OF PRESENTATION AND MANAGEMENT OF PATIENT WITH DISTAL RADIUS FRACTURES WITH CHRONIC REGIONAL PAIN SYNDROME TYPE 1

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### INTRODUCTION

Distal Radius Fractures occur frequently and the incidence is on an increasing trend due to old age, as these fractures are commonly seen in elderly in osteoporosis<sup>1</sup>. These fractures occur in all age groups. The fracture is usually because of trivial fall in elderly while in younger it is due to high velocity injury. These fractures can be intra or extraarticular. The fractures are treated either by conservative management by closed reduction and below elbow plaster slab/cast. The operative management can include various types of fixation like k-wire fixation, External fixation and ORIF with plating based upon the fracture patterns. These fractures are associated with various complications like malunion, non-union and complex regional pain syndrome type 1 (CRPS 1). CRPS 1 occurs with distal radius fractures more frequently than other fractures<sup>3</sup>. This can occur with fractures treated with both conservative and surgical cases. CRPS 1 is characterized by regional pain that is disproportionate to the severity of injury, with or without abnormal sensory, motor, vasomotor and trophic changes<sup>1</sup>. Allodynia or causalgia meaning that there is abnormal response to tactile stimulus in which simple light touch or pressure, shaking hand and even brushing also causes severe pain. Secondly not just the joint but also the entire upper limb including elbow and shoulder present with severe pain and stiffness thus giving it name of shoulder hand syndrome. The other names for CRPS 1 are Reflex sympathetic dystrophy, causalgia tell about its underlying pathology and manifestations<sup>2</sup>. Though this occurs in both upper and lower limb, it is found that it most common in distal radius fracture as per the available data in literature search. India is unique in that orthopaedic practices and fracture management are not limited to hospitals and doctors<sup>3</sup>. Many patients even then they are educated tend to go to native/traditional bone setters. The doctors and hospital management of distal radius fractures are changed enormously with respect to rehabilitation protocol. The early mobilization of fingers, thumb, elbow and shoulder in immediate post immobilization cast and post surgery day 1 or 2 have dramatically reduced the number of patients with CRPS 1<sup>4</sup>. However patients treated with native/traditional bone setters are usually immobilize for longer duration of time like 6 to 12 weeks and present to doctors/hospitals for management. Many patients from this set of group come to doctors/hospitals manifested with CRPS 1 of varying degrees. CRPS 1 is associated with severe morbidity and disability. Patient is in full distress due to pain. Prevention is better than cure so early mobilization of adjacent joints in immediate post immobilization/post surgery phase and mobilization of the wrist immediately after post removal of cast/post surgery is in a way that prevent the occurrence of CRPS 1<sup>4</sup>. The treatment modalities of CRPS 1 available are Medical management such as NSAIDs, centrally acting Analgesics, bisphosphonates,

Tricyclic antidepressants, Selective Serotonin reuptake inhibitors and topical applications. Sree Balaji Medical College and Hospital, being a tertiary care institute, We had lots of distal radius cases treated primarily by us and also cases presented late either due to neglect or treated elsewhere in other hospitals or treated with native/traditional bone setters.<sup>5</sup>

### **AIM:**

The aim of our study was to evaluate the clinical presentation and management of Patients with distal radius fracture with CRPS 1.

### **MATERIALS AND METHODS:**

The study design was descriptive observational study of patients with distal radius fracture presenting with CRPS 1 at Sree Balaji medical college and hospital, Chromepet, Chennai. We included all patients with CRPS 1 with conservatively managed distal radius fractures either primarily treated in our hospitals or other hospitals or native/traditional bone setters in adult population groups more than 18 years of age. We had 47 patients with CRPS 1 between January 2021 to December 2023. The patients were diagnosed with Budapest clinical criteria and treated with analgesics, electrotherapy and physiotherapy such as TENS, wax bath, active and passive mobilization of joints. End of treatment protocol is complete alleviation of pain, stiffness, sensory, motor and sudomotor signs and symptoms with no regional pain and stiffness.

### **We followed Budapest clinical criteria: It contains 4 categories:**

1. Continuing pain, which is disproportionate to any inciting events
2. Must report at least one symptom in all four of the following categories:
  - sensory – reports of hyperaesthesia and/or allodynia
  - vasomotor – reports of temperature asymmetry and/or skin colour changes and/or skin colour asymmetry
  - sudomotor/oedema – reports of oedema and/or sweating changes and/or sweating asymmetry
  - Motor/trophic – reports of decreased range of motion and/or motor dysfunction (weakness, tremor, dystonia) and/or trophic changes (hair, nail, skin).
3. Must display at least one sign at time of evaluation in two or more of the following categories:
  - sensory – evidence of hyperalgesia (to pinprick) and/or allodynia (to light touch and/or temperature sensation and/or deep somatic pressure and/or joint movement)
  - vasomotor – evidence of temperature asymmetry ( $> 1^{\circ}\text{C}$ ) and/or skin colour changes and/or asymmetry
  - sudomotor/oedema – evidence of oedema and/or sweating changes and/or sweating asymmetry
  - motor/trophic – evidence of decreased range of motion and/or motor dysfunction (weakness, tremor, dystonia) and/or trophic changes (hair, nail, skin)
4. There is no other diagnosis that better explains the signs and symptoms.

### **RESULTS**

We had 47 patients with distal radius fractures with CRPS 1 in our study who had non operative treatment. Among these only 6 patients were primarily treated in our hospitals using plaster cast and in the rest 41 patients, 3 were treated by other private medical practitioners with plaster slab (we had around 197 cases of distal radius fractures of which 44 underwent surgical fixation and 153 cases had non surgical treatment). The duration of immobilisation in these 9 cases were 21 to 28 days. The rest 38 patients were treated by native/Traditional bone setters with native bone splinting for period of 45 to 60 days. The patients treated by medical practitioners were advised early mobilisation of fingers, elbow and shoulder immediately after plaster slab and wax bath therapy and wrist mobilisation started immediately after plaster cast removal. Despite the treatment, these 9 patients did not comply with early mobilisation practises. Out of 47 patients, 21 patients

were within the age group of 60 to 69 years, 16 patients were above the age of 70 to 80 years and 7 patients were within the age group of 50 to 59 years and 5 patients were within the age group of 40 to 49 years. Female patients were 34 and male patients were 13 among 47. All 47 patients are treated with medical management using NSAIDs and physiotherapy such as wax bath, usg massage, TENS and mobilisation exercises. 35 patients needed centrally acting analgesics such as gabapentin and pregabalin. 25 patients were not responded to both NSAIDs and Central analgesics and they are treated with Tricyclic anidepressants and selective serotonin reuptake inhibitors. We did not use any interventional procedures such as sympathetic blockade, stellate ganglion blockade, intrathecal clonidine and intravenous regional guanethidine blockade, even then we had good treatment results of alleviation of pain and stiffness within average of 4 to 8 weeks of treatment course. 21 patients were recovered within 4 weeks of treatment course, 15 patients were recovered within 6 weeks and 11 patients were recovered within 8 weeks of treatment course.

## DISCUSSION

CRPS 1 aka Reflex Sympthetic dystrophy is a rare but devastating complication following fractures and immobilisation. In our study we observed patients with CRPS 1 followed by distal radius fractures<sup>4</sup>. We conservatively managed all the patients with average recovery time of 4 to 8 weeks<sup>2</sup>. Comparing with other studies, they treated patients with cognitive behavioural therapy, mirror therapy, and Interventional procedures but the outcome is same as out study<sup>4</sup>. In our study we came to conclusion that patients with distal radius fractures who underwent native bone splinting are diagnosed with CRPS 1, this is because of failure of early mobilisation. So CRPS 1 can be prevented by early mobilisation and proper physiotherapy<sup>6</sup>

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