Rehabilitation of Patient after Colle's Fracture using NMES - IS NMES Successful?

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Abstract

The case study was conducted on a Female patient age 45 years with Colle's fracture who was referred to Physiotherapy after immobilization period of six weeks. The study was done to determine the effectiveness of NMES in a post fracture stiffness case. Based on the study, it is concluded that NMES is an effective modality in increasing the ROM and Strength in a case of Post fracture stiffness. Patient showed marked increase in ROM and near normal muscle strength after five weeks of rehabilitation Programme which shows that NMES is a very effective Programme.

Key Words: **NMES (Neuro Muscular Electrical Stimulation), Mobilisation, Range of Motion, Colle's fracture**

Introduction

Patient was a 45 year old female who fractured her right wrist after an accident.

Examination of orthopedist revealed Colle's fracture and a cast was given for 6 weeks with wrist in 10º flexion and 8º of ulnar deviation. Immobilization was discontinued after 6 weeks when X-Ray showed healing of fracture site and patient was referred to physiotherapy.

Evaluation and Assessment

ROM measurement was done for wrist joint

	Active	Passive
Wrist Flexion	10º	15º
Wrist Extension	25º	30º
Radial Deviation	10º	15º
Ulnar Deviation	15º	25º
Pronation	45º	50º
Supination	30º	35º

ROM for shoulder, elbow and finger was normal.

MMT was not done due to pain.

Intervention

Short term goals

To decrease pain

To decrease oedema

Long term goals

To regain adequate ROM and strength

- NMES was selected to assist ROM by preventing fibrous restriction and joint contractures. To decrease pain and to increase sensory, visual and propioceptive input.
- Patient also received joint mobilization, active and active assisted range of motion. Exercise to wrist, elbow and digits.

NMES

Stimulation was given to both the flexors and extensor groups of muscles. Parameters chosen for the treatment were pulse width 300μs and pulse frequency was 30pps. For flexor group of muscles

one electrode was placed on proximal one third of forearm over flexor muscle Belly and other electrode was placed centrally over flexor tendon approximately 7 cm proximal to wrist crease. For extensor group of muscle the proximal electrode was placed on proximal one third of forearm over extensor muscle belly and digital electrode was placed 5 cm proximally to the wrist crease 10-15 muscle contraction for both the muscle groups were given twice daily and treatment was given 5 day a week for 5 weeks.

Joint Mobilisation

Grade 1 and Grade 2 mobilization was given to all the joints of wrist and hand followed by active exercises and active assisted exercise. A hot pack was given prior to the treatment and ice was given after the treatment to prevent muscle guarding.

A slight electrode placement change of electrode was done due to skin sensitivity of the patient.

Outcome

Range of Motion after 5 weeks of treatment

	Active	Passive
Wrist Flexion	75º	80º
Wrist Extension	70º	70º
Radial Deviation	25º	25º
Ulnar Deviation	30º	32º
Supination	80º	85º
Pronation	80º	82º

NMES was discontinued after 5 weeks when patient was able to perform good muscle contraction and had achieved 90 percent of ROM of wrist as compared to unaffected hand.

Discussion

Although the importance of NMES is regaining ROM and strength has not been well documented but NMES appeared to facilitate a faster and less painful return to function for patient after Colle's fracture. In this study NMES was used for five weeks and after five weeks programme ROM has markedly increased to near normal. After this study we can conclude the NMES is an effective modality for maintaining and increasing the length and tension of the muscle after a period of mobilisation. Moreover, it can also be very effective in preventing intra and extra articular adhesion formation after the period of immobilization. As in this study alongwith NMES mobilisation and strengthening technique were also used so efficacy of NMES for regaining ROM & Strength are needed to identify maximally effective treatment protocol. NMES appeared to be effective in faster and less painful means of regaining range of motion and strength after five weeks period of treatment.