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Effect of Manipulation/Mobilization Techniques on Pain and Range Of Movement in Post Operative Management of Colles Fracture

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Conflicts of Interest: Nil

Abstract

Introduction

Since 1814 when Dr. Abraham Colles, defined a distal radial fracture as a low energy, extra-articular fracture to the distal radius in the elderly population several aspects of this ubiquitous fracture have changed [1]. Presently,it is neither considered a specific low energy injury nor a exclusive to extra-articular region besides the singularity to elderly population has also drastically waned [2]. Current studies point towards an increase in the incidence of distal radius fractures in younger individuals and an overall increase in the incidence also [3,4,5,6]. Today it is believed that unsatisfactory results after colles fracture can be avoided with accurate reduction, properly holding the reduction and finally an early mobilization tailored to the specific fracture [7]. For this third and final step, the role of physiotherapy can't be overemphasized. In this context Maitland and Mulligan techniques present two different but widely employed manual therapy techniques for treating pain and stiffness [8]. The purpose of our study was to evaluate, the results of these 2 techniques separately during post operative management in patients who had undergone surgery for colles fracture.

Material and Methods

This was a study conducted on 60 patients who had undergone operative management of colles fracture in a tertiary care hospital. The study period extended from december 2015 to january 2017. Clear explanations regarding the study were given to all the patients. Written Informed consent were taken from the patients who agreed to share their treatment records for the study. Subjects who were included in the study were aged between 30-70 years.Side of involvement and gender were recorded. Patients with confirmed radiological diagnosis of colles fracture who were treated surgically with internal fixation only were included in the study. Patient with any other fracture in ipsilateral limb, osteopenia; previous distal radial fracture, wrist injury/deformity, pre existing inflammatory/degenerative joint conditions, sudeck's dystrophy, congenital deformities; stiffness for more than 8 weeks , uncooperative patients and patient with renal and cardiac disease were excluded from the study.

Assessment had been done by goniometer for range of motion and the visual analog (VAS) had been used for the assessment of pain. Patients were then divided into two groups with 30 subjects in each groups. Those patients who had been managed by maitland technique were put in Group A and those patients who had been managed with Mulligan technique were added to Group B till the total number of subjects was 30 in each group.

The 30 subjects of group A, received hot pack/ moist heat therapy for 15 min. Then maitland mobilization technique

(grade 1 and grade 2) for first 10 sessions and (grade 3 and grade 4) for the next 10 sessions.For wrist flexion: the patient starting position was with the forearm supine in the middle of the plinth with elbow flexed to 90 degrees. The therapist used to stand on the affected side of the patient just beyond the flexed elbow. The medial border of the patient's hand was grasped by the same side hand of the therapist .The thumb was placed against the dorsum of the patients metacarpals. The fingers were placed by the palm of the patient's hand. The opposite hand of the therapist stabilized the forearm of the patient midway just proximal to the wrist joint. Then the therapist's thumb flexes the patient's wrist and hand to the limit of its range ; followed by the therapist's finger returning the patient's wrist to its starting position. The return movements were controlled by placing the index finger near the patient's MCP joint. Similarly the extension exercises were carried out.

The group B patients received treatment with Mulligan mobilization with moist heat therapy as follows.

The 30 subjects received hot pack/ moist heat therapy for 15 min. Then mulligan mobilization is given for 20 treatment sessions

Patient position:Supine.

Therapist position: Standing /sitting adjacent to the patient.

Therapist grasps the distal end of the radius or ulna from medial and lateral direction with Web space of one hand. Web space of the other hand grasps the row of carpals on the other side from medial or lateral direction for mobilization. Therapist forearm angle should be maintained according to the joint line. The therapist stabilizes the radius using the web space of one hand. Therapist glides the carpals laterally in an oblique direction, such that the direction of the treatment plan is maintained distally and laterally. While the glide is sustained the patient is asked to do flexion and extension followed by passive over pressure.

Results:

Table 1: Patient details:

Sl. No.		Maitland (A)	Mulligan (B)
1	Age(years)	46.86 +/- 12.3	48.0 +/- 13.43
4	Sex	10 m/20 f	16 m/ 14 f

Table 2: Changes in VAS

Sl. No.		Maitland(n=30)		Mulligan (n = 30)	
		Pre	Post	Pre	Post
1	Pain (VAS)	8.13 +/- 1.04	4.43 +/-1.07	8.73 +/- 0.98	4.03 +/- 1.03

Table 3: a) change in wrist flexion (AROM)

	DAY 1	DAY 15	"t"	"P"
GROUP A	30.23 +/- 11.95	41.60 +/-12.59	10.97	0.00
GROUP B	25.30+10.32	33.10+/-10.99	18.49	0.00

Table 3 b) change in wrist flexion (PROM)

	DAY 1	DAY 15	"t"	"P"
GROUP A	33.03 +/- 11.74	47.36 +/-13.95	9.41	0.00
GROUP B	28.10+/- 10.99	37.40+/-12.07	13.71	0.00

Table 4:a) change in wrist extension (AROM)

	DAY 1	DAY 15	"t"	"P"
GROUP A	22.93 +/- 8.49	30.46 +/-10.01	10.32	0.00
GROUP B	23.50+/-10.37	30.66+/-10.44	13.31	0.00

Table 4 b) change in wrist extension (PROM)

	DAY 1	DAY 15	"t"	"P"
GROUP A	25.93 +/- 9.07	35.13 +/-11.58	10.82	0.00
GROUP B	25.83+/- 10.43	34.33+/-11.26	13.44	0.00

Table 5:a) change in wrist radial deviation (AROM)

	DAY 1	DAY 15	"t"	"P"
GROUP A	14.73 +/- 7.15	22.40 +/-6.96	10.70	0.00
GROUP B	11.96+/-4.36	17.76+/-4.87	12.19	0.00

Table 5 b) change in wrist radial deviation (PROM)

	DAY 1	DAY 15	"t"	"P"
GROUP A	17.53 +/- 6.92	25.80 +/-6.87	11.49	0.00
GROUP B	14.33+/- 4.39	22.46+/-3.87	15.39	0.00

Table 6:a) change in wrist ulnar deviation (AROM)

	DAY 1	DAY 15	"t"	"P"
GROUP A	20.20 +/- 5.04	28.80 +/-7.09	10.88	0.00
GROUP B	16.73+/-6.93	23.43+/-8.03	12.20	0.00

Table 6 b) change in wrist ulnar deviation (PROM)

	DAY 1	DAY 15	"t"	"P"
GROUP A	19.70 +/- 7.05	26.56 +/-7.79	14.34	0.00
GROUP B	17.40 +/- 5.60	24.53+/-6.22	9.12	0.00

Table 7:a) change in wrist Pronation (AROM)

	DAY 1	DAY 15	"t"	"P"
GROUP A	44.66 +/- 20.37	52.53 +/-20.06	10.59	0.00
GROUP B	34.00+/-12.29	42.13+/-14.89	8. 87	0.00

Table 7 b) change in wrist Pronation (PROM)

	DAY 1	DAY 15	"t"	"P"
GROUP A	47.16 +/- 20.87	56.53 +/-20.50	10.58	0.00
GROUP B	36.40+/- 12.67	45.80+/-15.20	9.25	0.00

Table 8:a) change in wrist supination (AROM)

	DAY 1	DAY 15	"t"	"P"
GROUP A	24.40 +/- 15.43	31.73 +/-18.04	8.60	0.00
GROUP B	22.40+/-13.43	29.76+/-11.99	3.63	0.01

Table 8 b) change in wrist supination (PROM)

	DAY 1	DAY 15	"t"	"P"
GROUP A	27.30 +/- 16.01	35.83 +/-18.59	8.52	0.00
GROUP B	25.46+/- 12.45	35.50+/- 13.58	9.61	0.00

Discussion:

One of the essential and commonly used treatment methods for the management of tissue, joint and movement dysfunction is probably the use of manual therapy [9]. Defined as " ...the use of hands in a curative and healing manner or a hands-on technique with therapeutic intent…" manual therapy works through a spectrum of different mechanisms .[10]

The Maitland Concept of Manipulative Physiotherapy(a form of manual therapy) pioneered by Geoffrey Maitland and his colleagues,"...emphasizes a specific way of thinking, continuous evaluation and assessment and the art of manipulative physiotherapy and a total commitment to the patient "[11]. Maitland's techniques involve the application of passive and accessory oscillatory movements to treat pain and stiffness.[12]

On the other hand Brian R. Mulligan advocated the novel technique of simultaneous application of therapist applied accessory mobilizations and patient generated active movements.

The average age of the patients in our study who underwent the maitland technique was 46.86 +/- 12.3 years and those who underwent Mulligan technique was 48.0 +/- 13.43 years. Changes in wrist flexion,extension,supination,pronation,ulnar deviation and radial deviation were all better in the Maitland group in comparison to the Mulligan group.On the other hand as per the Visual Analog Scale pain reduction was more marked in the group which was treated with Mulligan technique.

In our review of literature we could not find any other study comparing Maitland and Mulligan techniques for the postoperative management of Colle's fractures. It is probably the first of its kind.

Our study suffered from one weakness i.e the small study population.A more comprehensive study with a larger study population is a requirement that would eliminate the weakness.

Conclusion:

In our study we came to the conclusion that the Mulligan technique is more effective in pain relief as compared to maitland technique.On the other hand the maitland group showed superior results in terms of mobility achieved in wrist range of motion.

Hence when pain predominates mulligan mobilization may be considered a more effective technique and for the restoration of range of motion maitland mobilization appears to be more effective.

We believe that a more comprehensive prospective study with a larger study population with randomization is required to come to a conclusion.

Reference:

[1]. Altizer L. Colles?? Fracture. Orthopaedic Nursing. 2008;27(2):140-145.

[2]. Nellans K, Kowalski E, Chung K. The Epidemiology of Distal Radius Fractures. Hand Clinics. 2012;28(2):113-125.

[3]. de Putter CE, van Beeck EF, Looman CW, Toet H, Hovius SE, Selles RW. Trends in wrist fractures in children and adolescents, 1997–2009. J Hand Surg Am. 2011; 36:1810–1815. E2.

[4]. Bengner U, Johnell O. Increasing incidence of forearm fractures. A comparison of epidemiologic patterns 25 years apart. Acta Orthop Scand. 1985; 56:158–160

[5]. Khosla S, Melton LJ 3rd, Dekutoski MB, Achenbach SJ, Oberg AL, Riggs BL. Incidence of childhood distal forearm fractures over 30 years: a population-based study. JAMA. 2003;290:1479–1485.

[6]. Hagino H, Yamamoto K, Ohshiro H, Nose T. Increasing incidence of distal radius fractures in Japanese children and adolescents. J Orthop Sci. 2000; 5:356–360.

[7]. Cooney W. MANAGEMENT OF COLLESâ€™ FRACTURES. Journal of hand surgery. 1989;14 B(2):137-139.

[8]. Critically discuss the differences between the Maitland and Mulligan paradigms in the mobilization of a joint (3000 words) [Internet]. Gayyoga.gn.apc.org. 2017 [cited 29 August 2017]. Available from: http://gayyoga.gn.apc.org/Clinical essay.htm

[9]. Maitland's Mobilisations - Physiopedia [Internet]. Physio-pedia.com. 2017 [cited 29 August 2017]. Available from: https://www.physio-pedia.com/Maitland%27s_Mobilisations#cite_note-3

[10]. Lederman E. The Science and Practice of Manual therapy. 2nd ed. Elsevier: London. (2005)

[11]. http://www.imta.ch/ International Maitland Teachers Association. 2013.

[12]. Rajesh Gautam, Jagdeep Kaur Dhamija, Amit Puri. Comparison Of Maitland And Mulligan Mobilization In Improving Neck Pain, Rom And Disability. Int J Physiother Res 2014;2(3):482-87.