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# ACL Grade II, MCL Grade III and Hemarthrosis of Knee Treated Conservatively - 1 Year Physiotherapy Follow Up

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**Abstract:** ***Road traffic accidents are common especially in developing countries proper rehabilitation post soft tissue injuries facilitates early recovery and prevents long term complications. Aims & Objectives of this original research was to evaluate the efficacy of specific tailored exercises post hemarthrosis ACL, MCL of left knee. Materials & Methodology: 43 years old male after an RT accident sustained injury to left knee. He was treated conservatively by specific exercises based on the evaluation during the period from 16.08.2018 to 30.09.2019 in Chennai with twice a week frequency Results: subjects womac score was evaluated and analyzed statistically, (P<.01) prior to starting the study and an year with regular physiotherapy Conclusion: Problem based exercises were found to be more effective in restoration of subjects functional needs, and conservative treatment of knee injuries were more effective with one year follow up.***

**Keywords:** QOL - Quality of Life, ACL – anterior Cruciate Ligament, MCL – Medial Collateral Ligament , NWB – Non Weight Bearing, Hemarthrosis, Womac Score, ROM – Range of Motion, PNF – Proprioceptive Neuro Muscular Facilitation

## 1. Introduction

1) MCL has two important functional components, with its proximal division is important for valgus stability, distal division is more important for external rotation stability (Robinson etal 2006) and is one of the most commonly injured ligaments of the knee resulting from a valgus force (Indelicato etal 1995)
2) Medial knee injuries with an ACL tear, with conservative rehabilitation, aiming at controlling oedema, improving knee range of motion and restoring quadriceps function (Wojtys etal 1994)
3) Non operative treatment of medial structures, a rationle behind was they have the high intrinsic healing potential, with the physiological varus alignment of the knee, concave geometry of medial tibial plateau fowours anatomical healing, generous local vascularisation from the biological view (Tandogan & Kayalp etal 2017) along with early mobilization in animal models a favorable stimulus to healing (Thornton eta 2005) conversely, smoking can affect local micro vascularization and valgus mechanical axis medial knee structures can gets stressed (Wright etal 2010)
4) Prolonged immobilization must be avoided and reaching early full knee extension with isometric strengthening exercises, few case series have recorded grade III lesions with conservative treatment in 9 weeks (Indelicate etal 1990)
5) Grade III MCLL injuries along with ACL ruptures most of the literature recommends non operative approach to MCL (3-4 weeks) followed later ACL – reconstruction surgery (Battaglia etal 2009)
6) Granan etal 2004) have reported increasing trunk stability decreases the risk of knee injuries, hence core strengthening among ACL tear subjects conservatively treated (50% of ACL deficiency subjects) can successfully return to their activity. As few researches were available on conservative management of combined ACL and MCL injuries with one year follow-up, this research presentation gets more significant

**Aims & Objectives** of this original research was to evaluate the efficacy of evidence based exercises on a subject treated by conservative means with hemarthrosis, ACL and MCL of left knee in a follow up for an year

## 2. Background Information

Mr.XXX, Aged 43 an advocated by profession mesomorph non diabetic mellitus, hypertension gives a history of RTA in 16-08-2018 has sustained hemarthrosis, NMRI revealed MCL III, ACL II tears. Following due sterile aspiration, the knee was immobilized in AK cast by orthopaedic surgeon and was adviced for NWB (Non Weight Bearing) for 4 weeks and referred for rehabilitation from 16.08.18

He was treated conservatively from 16.08.2018 to 30.09.2019 till day using various exercise based physiotherapy techniques

## 3. Materials & Methodology and Clinical Prognosis

**Procedure**

He was treated conservatively with exercise therapy techniques such as PNF, Proprioceptive concepts, Pilates, functional reeducation with a frequency of twice a week with 25-30 minutes of exercise session at an intensity of 60-80% of MHR. The prognostic means were discussed as below with evidence

During first 4 weeks with leg immobilized in AK (Above Knee) pop cast, later a slab the following means of physiotherapy were used.

Ankle and toe movements, active hip exercises, resisted means of exercises to contra lateral leg, both upper extremities, push ups, NWB walking using walking frame with weekly thrice frequency. After the removal of above knee pop slab as on 16.08.2018.

## 4. Results

**Table 1:** Physical methods, clinical prognosis conditions on 16.08.2019 and 30.09.2019

| Physical Condition as on 16. 08.2018 | Methodology used | Outcome Means as on 30.09.2019 |
|---|---|---|
| 1) Pain: Increasing with movements, walking and daily routine VAS 8/10 | Hot pac application, PNF, irradiation techniques were used | Pain has decreased as evidenced with near normal daily activities prior to injury. VAS – 2/10 |
| 2) ROM of knee $10^0$-$20^0$ active flexion | 1) Knee mobilization<br>2) Functional rehabilitation<br>3) Hold – relax techniques | Active ROM has improved to $0^0$-$120^0$ |
| 3) Motor power of quadriceps (Vastus Medialis) Atrophy of quadriceps | 1) Closed kinematic exercises,<br>2) Vastus Medialis strengthening<br>3) Dynamic exercises in standing | With an improved motor power, his level of confidence has increased for walking, stair climbing and his daily routine activities was able to walk with unaided and an improved gait. |
| 4) Subjects confidence on knee stability has fear of knee buckling | 1) Core strengthening exercises<br>2) Hip abductors, Vastus Medialis<br>3) Hip extensors, along with<br>4) Contra lateral leg was also strengthened | |
| 5) Gait antalgic gait | 1) Gradual increase in weight bearing, ROM, motor power | |
| 6) Muscle circumference atrophy of quadriceps | 1) Vastus medalists exercises<br>2) Knee strengthening<br>3) Closed kinematic exercises | An improved motor power and better usage for injured knee was recorded |
| 7) Social activities unable to drive two wheeler and floor level activities, fear of buckling to not attending work, social events | 1) Weight bearing exercises in standing, using physioball, using physioball, floor level activities | Resumed his work, started attending social activities and able to use floor level activities prior to injury. These bimonthly measures with specific exercises at an intensity of 60-80% of his MHR |
| 8) Functional activities and QOL | Gradual progression with weekly thrice to twice then to once a week to frequency and subject follow up with bimonthly from October 2019 | |

**Table 2:** Womac score using paired 't' test

| | | | SD | SE | t | p |
|---|---|---|---|---|---|---|
| Womac Scale | Pre | 76 | 27 | 15 | 4.27 | P<.01 |
| | Post | 12 | | | | |

## 5. Discussion

The critical analysis from this original research with evidence were:

1) Can ACL tear be conservatively treated?
2) How much prognosis to espect in ACL + MCL
3) Any future complications be addressed how?
4) Orthopaedic rehabilitation how much evidenced are with combining various techniques?

1) a. In a 10 year prospective study with 832 subjects having ACL tear, were classified in copers and non copers with 345 patients, among 146 as copers 66% of these copers were conservatively rehabilitated successfully without surgical reconstruction and return to activity (Wendy Hurd etal 2008)
   a) Decline etal 2012 in a systematic review has recorded that no evidence based available for ACL reconstruction and knee stability could be achieved with neuro muscular coordination than surgery.
   b) 11 years follow up among 109 Switzerland subjects have recorded similar to physical activities and ACL injury subjects treated conservatively and with reconstructive surgery but secondary meniscal tear was reduced among those undergone surgery, Fithian etal 2005 in a 6.6 year follow up reported ACL – R cannot prevent occurrence of knee joint degeneration. This research where conservative physiotherapy can be effective among a subject with combined ACL III and MCL III injuries was rehabilitated and return to pre injury level of his professional, social and daily physical routine in an year follow up as supported by the above literature.

2) Prognosis therapeutic exercise programs often must be modified an changes in subjective and objective findings (Cavanaugh 2003). Patient compliance with activity modification and have therapeutic exercises are vital for complete rehabilitation and a successful outcome (Cavanaugh etal 1991). Along with different concepts of rehabilitation were used based on subjects evaluation, adherence with therapy by the subject during this 1 year follow up was worthy recording here. However further follow up can show the direction of sustained positive prognosis.
3) Brain J etal 2017, even after ACL reconstruction which can contribute to greater functional limitation, where as this can be overcome with suitable strength training and neuro muscular rehabilitation techniques. In concurrence with Brain et al research, during this one year of therapy

this research subject with combined ACL and MCL injury was treated with neuro muscular and strengthening techniques.

a) Zazulak etal in 2007 among 277 subjects have recorded subjects with knee injuries have higher trunk displacement resulting in Proprioceptive deficit of knee, hence core exercises can influence on dynamic stability of the knee.
b) Sankar etal 2006 has non operative management of MCL along with ACL – reconstruction in a five year follow up had stable knee joint and reached pre injury athletic level with grade II / III
c) Proprioceptive exercises producers compensatory muscle activation patterns in the neuro muscular system that assist with joint stability (Cooper etal 2005)
d) Ford etal 2003 have recorded closed kinematic chain exercises in ACL rehabilitation to correct neuro muscular imbalance, reduction of injuries and improving knee function. An improved QOL (as shown in table: 2) post ACL and MCL injury, where conservatively this research subject was treated includes above said techniques such as core strengthening, Proprioceptive and PNF as shown in Table: 1.

## 6. Conclusion

Patient centric exercises with more priorities for his functional needs were found not only to be effective but convincing and confidence of the subject in the therapy and therapist were recorded to be stronger. Also conservative treatment with exercise therapy for knee injuries can be more effective as a rehabilitation mean, a key outcome of this research follow up. However study findings needs validity with follow up, larger sample size and evaluation of each technique

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