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# SCIATICA – POST MICRODISCECTOMY L4, L5 WITH PILATES AND PHYSIOTHERAPY – AN EVIDENCE BASED STUDY

**Dr. Subramanian, S.S.**

Orthopaedics, Education Physiotherapy, the Principal, sree Balaji College of Physiotherapy, Chennai – 100

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***Corresponding author***

**ABSTRACT**

**Introduction:** Lowback ache with sciatica is a common musculoskeletal disorder seen with long period of sitting as with many occupations. Microdiscectomy, a keyhole surgery in the managem ent of disc lesion is used often.

**Aims and Objective:** of this research was to evaluate the impact of combined Pilates and physiot herapy using Oswestry lowback pain score.

**Materials and Methodology:** 58 years old advocate treated for lumbar canal stenosis twice wit h lumbar Microdiscectomy in 2012 for L3, L4 and February 2017 for L4, L5, with post operativ e right sciatica, weakness of EHL (Extensor Hallucis Longus) and dorsiflexors (Right) using co mbined Pilates and physiotherapy with weekly, Frequency of twice during the period from 02.05 .2017 to 06.09.2017, in 21 session's subjects. Pre and Post Oswestry lowback pain functional sc ore were recorded and analyzed with statistical means. Results have shown an statistically signif icant functional improvement from lowback pain as indicated P<.05

**Conclusion:** Through the subject has improved over all function, her right ankle weakness (dor siflexors) and great to weakness (Extensor Hallucis Long us) requires further treatment with ele ctrical stimulation and orthotic measures.



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## INTRODUCTION

- Lowback pain is currently the number me cause of disability in the world affecting 1/5th of the global population (Hoy March etal 2014) and leads to a reduction in overall function and independence
- Variations and management of back pain is not surprising as rates of hospitalization and surgery for lowback pain vary widely by geographic region (Ciol etal 1996)
- Rainville etal 2009 has with evidence reported that conservative management aims to improve patients function and surgery focused on the alternation of structures perceived to be the sources of pain.
- Lumbar spine disorders rank fifth among disease categories in the cost of hospital care and accounts for higher costs resulting from absenteeism from work and disability than any other category (Van Tulder etal 1995)
- With 1.5 million disc surgeries performed annually worldwide (Fry Moyer etal 1988) and USA has the highest rate of spinal surgery (5 times that of similar surgeries from great Britain) (Deyo etal 2001) with US health care system spending on lumbar discectomy annually $ 300 million (SchoenFeld and Weiner 2010)
- Unlike traditional resisted exercises where individual muscles are exercised, Pilates exercises enable coordination of several muscle groups at one time (Pilates 2001)
- Pilates consists of a physical exercise that uses resources such as gravity to resist or assist movement (Gagnon 2005)

**Aims & Objective of this original research** was to evaluate the impact of combined Pilates and physiotherapy exercises on quality of life using Oswestry lowback pain subjective rating scale.

## MATERIALS AND METHODOS

This study subject post Microdiscectomy of L3, L4, L5 for lumbar canal stenosis was treated for (right) sciatica and

extensor hallucis weakness and foot drop (right) with non invasive physical exercises of Pilates and physiotherapy using Physioball during the period from 02-05-2017 till 06-09-2017 in Chennai with weekly twice frequency for 21 sessions. The nature of exercises were closed kinematic and irradiation technique. Each session lasted for 20-25 minutes. Subject's physical signs, heart rate were monitored. Progression was done gradually and the subject was explained about the nature of exercises, subsequently side by side she was advised to improve her daily routines, floor level activities, social activities, professional means and due feedback were obtained.

**Background Information**

58 years old female known diabetics for 23 years and on medication, an advocate by profession gives post medical history of having undergone Microdiscectomy of L4, L5 in Chennai based hospital in December 2012 and again on 02-05-2017 was operated for L3, L4 lumbar canal stenosis is on right side with micro lumbar decompression at the same hospital LSCS in 25 years back presently she complaints of lowback ache with right side pain back of high up to calf with immobility to move her right foot big toe and was attending the centre where the author works since 02 -05-2017 till today.

**O/le**

- Ambulant with mild antalgic and mild list to left side
- Waist circumference: 96 cm BMI: 26 kg/$m^2$
- SLR right $50^0$ increases radicular symptoms
- Exaggerated lumbar lordosis
- Spinal movement could not be tested due to pain
- Right Capsulitis (Shoulder) and right knee
- Grade I osteoarthritis changes of

**Provisional Diagnosis**

Lowback ache post micro discectomy L4, L5 and L3, L4 for lumbar canal stenosis

## RESULTS

With an improved self esteem, confidence and resuming her daily routines and as an advocate the pre and post Oswestry subjective rating scale were recorded and analyzed statically.
Table of Results of Pre and Post Oswestry Lowback Rating Score Using Paired Student 't' Test

## DISCUSSION

- Peul etal 2007 have recorded among 141 subjects analyzed conservatively treated and those who underwent Microdiscectomy in a one year follow up with similar pattern of recovery
- Core strength training is easier subjects for to learn although it is challenging compared with typical resistance training among lowback pain (Gatti etal 2011)
- It is note worthy that 72 year old subject with L4, L5, L5-S1 disc lesion who was treated conservatively for radicular symptoms and foot drop (Dorsi Flexors 2/5) have shown significant improvement with core

**Table 1. On motor power examination of the subject**

| | Left Maximum 5 | Right Maximum 5 |
|---|---|---|
| | Ext | Flex |
| Abdomen | 3 | 3 |
| Knee | | |
| Flexors | 4 | 3 |
| Extensors | 4 | 3 |
| Ankle | | |
| DF Dorsiflexors | 4 | 2 |
| PF Plantar Flexors | 4 | 3 |
| Toes | | |
| EHL | 4 | 2 |
| Subtalar | | |
| Invertors | 4 | 3 |
| Evertors | 4 | 3 |

Note: manual muscle testing of MRC was used here

**Table 2. Staged Treatment and Clinical Prognosis**

| Treatment Given: Therapy | Prognosis |
|---|---|
| 1-4 sessions<br>I. Foot and ankle right passive stretching<br>II. Supine pelvic bridging<br>III. Isometric abdominal exercises<br>IV. Hip abduction in side lying<br>V. Sitting quadriceps strengthening, dorsiflexors, hip flexor exercises 1 set and 3 repetitions | I. Pain level has decreased from the lower back<br>II. Gait has slightly improved from antalgic gait<br>III. Confidence level was noted to be improving |
| 5-10 Sessions<br>Core exercises with Physioball in side lying, supine and prone positions, prone knealing with ball<br>2 sets and 3 repetitions also irradiation technique for EHL and dorsiflexors started. | Floor level activities were encouraged also daily routine where spiritual based prayers were encouraged mainly in floor level |
| 11-15 Sessions<br>Repetitions were increased to 5 along with manual resistance. Adviced to walk for 10 minutes | Self confidence was<br>I. Better duration of sitting for her professional activities, walking, driving has improved without pain has an improved gait, social activities, travelling and started her professional and daily routine prior to surgery but ankle DF have improved and EHL yet to recover. |
| 16-20 Sessions:<br>Right shoulder mobilization added programme was taught frequency of visit to author was decreased to once a week | |

| 3234 | Test | | SD | SE | t | p |
|---|---|---|---|---|---|---|
| | Pre | 64 | 20 | 12 | 3.5 | <.05 |
| | Post | 28 | | | | |

strengthening in one month (Subramanian 2017) where as this study subject who under went lumbar discectomy of L4 and L5 twice was left with great toe drop and foot drop despite of 4 months of vigorous physical therapy with weekly twice frequency, but she has good functional recovery with Oswestry score with statistically significant result as shown in table 2

- The role of surgery for chronic lowback ache is under debate (Fritzell etal 2001)
- Sekenditz etal 2007 have recorded with pilates among 38 female adult between 30-47 years with positive effects on lowback strength, endurance and flexibility
- Gonul Babyrigit Irez etal 2011 have in a 12 week study with Pilates among 60 female geriatric subjects have recorded an improved dynamic balance, reaction time and muscle strength and flexibility.

**Critical Appraisal of this research report**

- Extension of great toe not yet achieved
- Functional recovery was only established in this study but structural changes needs validation with EMG, NMRI
- Self confidence, resuming daily routines and professional activities were achieved, but sustainance of the same for further days to come depends on continued patients adherence to therapy
- Tibialis anterior muscle (Dorsiflexors) have improved from 2/5 to 4/5 but extensor hallucis longus has remain the same at 2/5, hence electrical stimulation and orthotic support to be considered 22.09.2017
- Right shoulder movements have become more flexible with reduced pain

**Limitations of this original research:** Was being a case study design, limited duration of follow up, few outcome measures of single physical modality were used. However the same study can be validated with larger sample size, longer duration follow ups and involving other measurable variables such as NMRI

**Further Recommendations of this study:** Could be done with comparing the effects of Pilates and physiotherapy of conservatively and surgically treated subjects in patients with lumbar canal stenosis and using functional electrical stimulation, electrical stimulation of dorsi flexors EHL and using orthotic appliances.

**Conclusion**

Post operative exercises as in this subject were based on innervation of muscles from L3, L4 and L5. Combined Pilates and physiotherapy were used in this study. In 21 sessions the pattern of recovery was convincing similar time framed rehabilitation of lowback ache subjects could be carried as continuation of this study, but needs scientific validation from larger experimental and control subjects.

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