



## Case Study of a Two Years follow up on a Subject Receiving Physiotherapy with Obesity, Movement Disorder, Hemiparesis and Bilateral Osteoarthritis Knee

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### Abstract

*Obesity remains a major predisposing factor for osteoarthritis, this subject with left hemiparesis and dyskinesia. Physiotherapy, resisted exercises using Physioball and inversion therapy in a two year follow up with a drop in obesity, improved quality of life and the need to undergo total knee replacements are avoided remains the major outcome of this case study.*

**Keywords:** TKA – Total Knee Arthroplasty, OA – Osteoarthritis, ROM – Range of Motion.

### Introduction

- 1) Obesity is a well recognized global epidemic with WHO estimation of 1.4 billion adults are overweight (Lauren etal 2013) and is associated with an elevated risk of an array of chronic diseases, and its implications for the Musculo skeletal system include degenerative and inflammatory conditions (Ananda etal 2009), with greatest burden resulting from osteoarthritis.
- 2) Osteoarthritis is a clinical syndrome of joint pain and dysfunction caused by joint degeneration and nearly 10% of the population is affected and the prevalence increases with age (Brooks 2002). Obesity is the greatest modifiable risk factor for osteoarthritis (Szoeki etal 2006). Osteoarthritis affects all aspects of life through pain and limitation of mobility. The burden of this disease is expected to

increase due to the prevalence of obesity and increased longevity (Lauren etal 2013). The economic burden of osteoarthritis in US was second only to diabetes in obesity associated conditions, similar negative economic impact was published from UK Analysis (Ananda etal 2012). Osteoarthritis varying in severity from mild to severe, exercise therapy is regarded as the corner stone of conservative management of the disease (Farr 2008) and exercises combined weight loss appear to be more effective than either intervention alone (Messier etal 2004). The objective of this case study is to analyse various physical therapy techniques in a subject with hemiparesis movement disorder, obesity in bilateral osteoarthritis knee in improving his quality of life.

Mr.XXX, Aged 61 years, known left hemiparesis, hypertensive and dyskinesia is medically treated with T. Repace 40mg and T. Syndopa 110mg twice daily. An endomorph weighing 98 kg, highly constipated, with sedentary life style. His complaints includes pain over both knee joints, inability walk with ease and slowness of activities, Standing X – Ray Revealed: reduction of medial joint space with deformities of both knee joints, right knee showing more changes than left knee joint.

Physical examination as on 11 -06-2014 the following were the findings:

- Ambulant unaided with antalgic gait, balance in standing moderate.
- Mild hyper reflexia and hypertonia noted on left upper and lower extremity with good motor control.
- Exaggerated lumbar lordosis with abdominal muscles motor power II/ V and spinal muscles weakness along with restricted spinal flexion.
- Bilateral hip and knee flexor tightness motor power 3/5.

Knee Active ROM of Right: 10-80<sup>0</sup>  
Left: 5-90<sup>0</sup>

Bilateral Vastus Medialis Lag Positive

Cadence – 15 Steps/ Minute

Provisional Diagnosis: obesity, bilateral Osteoarthrosis knee joint, left hemiparesis with dyskinesia.

- His anthropometric findings:

Height: 162 cm BMI: 37 kg/m<sup>2</sup>

**Results**

Results of pre and post Rom, Motor Power, Womac Score, BMI and Waist Circumference of this subject.

**Table: 1**

	Range of Motion		Motor Power	Womac Score %	BMI	Waist Circumference
Pre	Right 10-80	Left 5-90	Bilateral Hip –3/5 Knee- 4/5 Abdomen- II/V Spinal – II/ V	63	Height: 162 Weight: 98 BMI:37 kg/m <sup>2</sup>	112cm
Post	5-120	3-106 <sup>0</sup>	Hip – 4/5 Knee – 4/5 Abdomen – III/ V Spinal – III/ V	18	Weight: 87 BMI: 33 kg/ m <sup>2</sup> (BMI Decreased by 4 kg/ m <sup>2</sup> )	91cm (Decreased by 20%)

Waist Circumference: 112cm Weight: 98 kg

Heart Rate: 90/ minute BP: 130/86 mm/hg

He was treated with the following means:

- Strengthening of hips, knees and spinal muscles.
- Weight reduction exercises with Physioball.
- Specific yoga postures with resistance using Physioball such as Veerasana, Matsyasana, Bhujangasana and Cat and Camel Postures.
- Inversion therapy using Physioball.

**Duration**

30-35 minutes with a frequency of twice a week of each session at 70-80% of maximal heart being the intensity of each session. No untoward incident recorded with profuse sweating on each session was noted.

Prognostic physical findings after three years of the above said therapeutic means were as below:

- Hip, knee and spinal muscles were stronger than earlier.
- Range of motion in hips, knees and spine have improved.
- An improved cadence and self confidence were noted.
- He was able to walk continuously for 20-25 minutes.
- Level of physical activities have improved as noted in the womac score.
- Cognitive functioning was shown mild improvement.

### Background Information

Being a hypertensive, left hemiparesis and dyskinesia patient the subject had difficulty in walking, low self esteem, less self confidence and decreased level of physical activities. Also with obesity, both knee joints he developed Osteoarthritis he was advised bilateral knee arthroplastic surgery. With due medical care of the above said conditions, he was treated with physiotherapy.

### Discussion

- 1) People with obesity have greater absolute knee adduction moments due to increased body mass, engage in compensatory gait patterns such as slower walking velocity and increased toe-out angle (Lai et al 2008). Waist circumference was associated with lower osteoarthritis risk. A reduction in waist circumference by 20%, hence the subject's risks for complications with osteoarthritis are decreased (Holliday et al 2011).
- 2) Weight loss has been demonstrated to improve with pain and function in obese subjects with knee osteoarthritis in a 175 subjects using 16 week study BMI, MRI, diet (Gud Bergson et al 2012). Christensen et al (2007) in a meta analysis 4 intervention studies of 454 over weight patients with osteoarthritis knee found that weight loss resulted in significant reduction in physical disability. This subject has recorded 4% drop in BMI has in line with the above study has shown marked improved physical function.
- 3) Knee osteoarthritis is a common disability condition and 12% adults above 60% have symptomatic knee osteoarthritis and total knee replacement helps to reduce pain, restore function and mobility for arthritis pain sufferers (AOA 2013) out comes after TKA are not uniformly excellent, with perioperative complications, post operative functional impairment levels, prosthesis failure and procedure cost (Katz et al 2004) with dissatisfaction of patients after TKA between 20% (Bourne et al 2010). This study subject having had a reduction in obesity and improved physical functional means, the need to undergo TKA is avoided, but for continued benefits he has to sustain the progress along with all the physical measures carried in this study.
- 4) Salah et al 2015 have found that Musculo skeletal complaint of obesity is more in weight bearing joints (osteoarthritis knee 50%). Strength training impact to minimize loss of lean muscle mass that would otherwise exacerbate muscle weakness (Toda 2001) and resisted exercise improved pain and function by clinically meaningful in people with osteoarthritis knee (Lange et al 2008). Added to the weakness of the quadriceps muscle people with osteoarthritis knee exhibit significant strength deficits of the hip muscles (Hinman et al 2010) with an improved strength of hip and knee muscles bilaterally the subjects pain has reduced considerably and was able to perform most of these daily physical routines as reflected in subjective womac score from 63% to 18%.
- 5) Inversion therapy along with Physioball promotes cognitive and improves neurological ailments (Subramanian 2015). This subject along with other exercises was treated with inversion therapy using Physioball, was found to have as increased physical activity (Earlier he had dyskinesia), an improved cadence and over all self confidence.
- 6) Messier et al 2004 from the adopt cohort showed that kg of weight loss will result in 4kg reduction in the mechanical load exerted on the knee joint per step during daily activities. Filson et al (1992) concluded that a loss of 5 kg reduced osteoarthritis risk by more than 50%. Weight loss in obese subjects may also provide structure modifying benefits.

Moderate weight loss (9%) in obese subjects can improve cartilage quality (Anando 2012). Thus this subject with more than 9% weight loss in body weight should have benefited.

- 7) March and Bagga (2004) should the risk for knee osteoarthritis increased by 36% for every 2 units of BMI (5 Kg) of weight gain and BMI of more than 30 increased the risk for knee osteoarthritis approximately 20 fold. Coggon et al (2001) a reduction of their weight by 5 kg or until BMI was within recommended normal range, 24% of surgical cases of osteoarthritis might be avoided. With a drop of 11Kgs in this study subject the risk for having undergoing surgery could be avoided, but further weight loss by the subject can ensure risk reduction for surgery.

### Conclusion

With resisted exercises using Physioball and inversion therapy, The results of the two years follow up with continued physiotherapy from 11-06-2014 to till today forms the core of this case study presented here were applied based upon clinical situation in this study based on evidences and an interesting aspect noted in this study is a comprehensive core with physical therapy means including strengthening exercises for weak muscles, weight reduction means with resisted exercises using Physioball and inversion therapy. Hence both neurological ailments and musculoskeletal ailments are treated combined with same therapy sessions for an early time formed over all, Rehabilitation is a major outcome of this original case study.

**Limitations of this study** includes further long term follow up required and larger sample size, the study could be extended with more variables for stronger validity and reproducibility.

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