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Case Report

Physiotherapy rehabilitation in severe damaged osteoarthritis knee following surgically treated bilateral total knee replacement – A case study

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ABSTRACT

This 62-year-old female patient case study describes physiotherapy rehabilitation exercises of stage 4 osteoarthritis in the post-operative phase. The patient has pain, symptoms, decreased adl activities and decreased quality of life (study measures completely done by Koos scale). Following surgical managed total knee replacement patient gets better with her symptomatically level and this study tells the importance of replacing knee joint in time as suggested by an orthopaedic surgeon, else there would be a marked functional outcome limitation of the patient. It also emphasis on the importance of physiotherapy and maintaining the operative knee joint in long term care.

1. Introduction

Total knee replacement is a surgical procedure to replace the weight-bearing surfaces of the knee joint to relieve pain and disability and improve better functional outcome. Osteoarthritis is a progressive, degenerative joint disease that affects primarily weight-bearing joints. It commonly affects the knee joint. Osteoarthritis symptoms often develop slowly and worsen over time; the main symptoms are pain, swelling, tenderness, stiffness, decreased range of motion and mostly at the worsening stage with deformity. [1–3]

The Knee replacement surgery can be performed as a partial or a total knee replacement. They replace the damaged joint surfaces of the knee with metal and plastic components shaped to allow continued motion of the knee.

The operation typically involves substantial postoperative pain and includes vigorous physical therapy. To increases the likelihood of a good outcome after surgery, multiple exercise-based interventions on physical therapy with weight management is necessary.

The patient also requires psychological and behavioral support and likely to involve back soon in social reintegration. In these weeks, the therapist will help the patient return to normal activities, prevent DVT, increases knee ROM and to prevent bedsores and improves circulations. At the same time strengthen the surrounding muscles. [4–6]

Osteoarthritis symptoms often develop slowly and worsen over timescale therapist. Mobility is an important aspect of human biology that has many important benefits on the body system. It is well documented in the literature that physical immobility affects every body system and contributes to functional complications of prolonged illness.

2. Patient Information

A 62 YRS old female who presented with pain, swelling, tenderness, stiffness, decreased range of motion with deformity and functional mobility restriction underwent bilateral Total knee replacement. She has a past history

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of osteoarthritis symptoms for 10 years where she managed conservatively with physiotherapy. She takes on and off frequent treatment with interferential therapy with wax and rehabilitation exercises when pain flares up. Her socioeconomic status was normal and she has no comorbid.Her preoperative evaluation is restricted knee flexion right knee 100-degree knee flexion and 10-degree extension lag with genu varum deformity, her left knee is with 110-degree flexion with 0-degree extension and no genu varum deformity. Her right knee is damaged more compared to her left knee. Her koos scale value is 20 where she has issues with pain, symptoms, adl activities and quality of life. Her requirement is to get back to perform yoga for wellness.[7–9]

Her pre-operative physiotherapy exercises were isometric knee exercises with a conventional range of motion exercise with breathing exercises – 10 reps*3 sets per day. The patient stayed in the hospital following the procedure for seven days. Physical therapy was initiated on the day of surgery following the procedure. The patient underwent TKR on the left side on first and then TKR on the right side. The patient has a complaint of severe pain on the left knee than the right knee before surgery.

3. Physical Assessment and Interventions

Treatment of physical therapy on 1 post operative day

Ankle pumps to the bilateral ankle are encouraged. To prevent deep vein thrombosis formation, reduce the swelling over the ankle and helps to improve blood circulation.Mild passive knee flexion was initiated on the operated side [left] and extension to prevent the joint stiffness, strengthen the muscles around the knee (rectus femoris, vastus medialis oblique, vastus lateralis, gastrocnemius and soleus). Active movements to both upper limbs and non-operative side (right).

Breathing exercises and incentive spirometer are done by the patient frequently for every half an hour to avoid lung/ chest infection after post anaesthetic effects and to avoid the breathing difficulty which helps to mobilize the patient better without the breathing difficulty. The patient is made to stand with long knee brace support on the operated side for the first one or two days to avoid knee buckling. High sitting knee mobilization is done on the non-operative side. The patient is made to stand in full weight-bearing with walker support. Treatment over the next days, we concentrate on strengthening exercises to restore normal tissue mobility and joint range of motion. Early manual interventions utilized include soft tissue mobilization to the muscles surrounding the knee joint (Rectus Femoris, Vastus Lateralis, Vastus Medialis Oblique and Gastrocnemius and Soleus).

Mobilization attempted to the patient with the walker support, which helps to increase the amount of weight-bearing on the operated leg and they are able to tolerate full weight -bearing with the guidance of physiotherapist.After doing exercise therapy, cryotherapy application is given to the surgical site for 10- 25mins

Muscle strengthening protocol.

3.1. Stage 1-2 weeks

1. Ankle pumps
2. Quadriceps sets
3. Gluteal sets
4. Heel slides
5. Abduction/adduction of hip
6. Short arc quadriceps
7. Seated range of motion to knee
8. Seated flexion stretch
9. Straight leg raise
10. Knee extension stretch

Patient performed with 5 to 10 repetition*3 sets/day – she has followed up with home care physiotherapy support for next 6 to 8 weeks with weekly four sessions under our supervision.

3.2. Stage 2-4 weeks

1. Additional to the above exercise
2. Seated hamstring stretch
3. Standing hamstring curl
4. Heel raise
5. Side straight leg raise
6. Long arc quadriceps
7. Standing calf stretch
8. Clamp shell
9. Adductor and abductor strengthening
10. Gait training- functional based routine.

Patient performed with 15 repetition*3 sets/day. she was advised to carry out the stage/week one exercise sessions

3.3. Stage 4-8 weeks

1. Pelvic bridge
2. Standing mini squat
3. Single leg step up forward
4. Single leg step up lateral
5. Resisted knee flexion
6. Prone knee bending
7. Static bicycle
8. Balance training

3.4. Follow up and outcome

Her post-operative koos scale evaluation is 78 with marked reductions. In pain, symptoms, adl activities and quality of life. Her postoperative evaluation is knee flexion right knee 100-degree knee flexion and 3-degree extension lag with

reduced genu varum deformity, her left knee is with 120-degree flexion with 0-degree extension and no deformity. She has marked improvement on her right knee which is symptomatically troubling her. The patient performed with 15-20 repetition*3 sets/day on all the above exercises along with yoga asanas which doesn't harms her condition. The patient also advised doing regular closed kinetic chain exercises alongside with functional rehabilitation exercise routine for the next 12 to 18 months. She was educated about her progress on the replaced knee and the benefits of performing regular exercises.

4. Discussion and Conclusion

Failure of conservative managed physiotherapy treatments lifestyle changes, weight management, with medications leads to total knee replacement non - satisfactory phase of the patient leads to surgical procedure. This patient gets a good result after bilateral total knee replacement. The patient received acute care rehabilitation in the hospital for seven days after the surgery and continued physical therapy for four to eight weeks. By following the above exercises and cryotherapy there is improvement in knee range of motion and reduction of pain. So it helps to avoid deformity in the knee and improve the gait. We gradually increase the strength training and repetitions of exercises depend on patient ability. Additional to the exercise improve the patient to do their ADL activities. The patient still has concerns on comparing the surgical outcome on pain, range of motion, and functional limitations with the right knee compared to the left knee. She also has concerns about cross-leg sitting and frequent long-duration standing for her cooking activities. She has been advised to follow up for the next 18 months for her knee outcome betterment requirement.This study gives a clear clarity that there is some difference in functional outcome measures both on patient-oriented and clinical measures on bilateral total knee replacement this is because of the more load and weight-bearing happens on the one knee in compared to other. it is also evident that patient gets symptomatically better with reduced deformity level and improved ADL function and quality of life

5. Limitations

This patient study is restricted to 8 weeks follow up, but she requires long term follow up.

6. Source of Funding

None.

7. Conflict of Interest

None.

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