Rehabilitation Of Knee Osteoarthritis With Varus Deformity: A Case Report

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Abstract

Introduction: Osteoarthritis (OA) is one of the most common causes of chronic disability in the adult and geriatric population. It is known that 10% of the population aged 65 years and over suffer from knee osteoarthritis. Physical Medicine and Rehabilitation Specialist will often deal with cases of osteoarthritis due to the increasing prevalence of osteoarthritis globally, especially in long-term outpatient services.

Case: A 58 years old, female, was referred from the Orthopedic department with a diagnosis of right Osteoarthritis knee grade IV and left Osteoarthritis knee grade II need for Total Knee Replacement (TKR). She felt pain in both knees since 5 months ago with a Visual Analog Scale (VAS) is 6. She is psychologically not ready yet for TKR. She stopped working due to her condition. The joint's range of motion of the right knee joint range was limited in flexion (0-130º). Physical examination revealed a tender point at the medial area of the knee, crepitation in both knees, a positive patellar grinding test in both knees, a positive varus test of the right knee, atrophy on both vastus medialis muscles, and knee varus deformity. We provide rehabilitation programs for the patient such as giving physical modality (SWD), strengthening exercise, aerobic exercise, knee brace, home education, and home exercise program. Following the rehabilitation program for 3 months, the patient felt more fit, full right knee range of motion was obtained. She walked more easily with her knee brace and experienced improvements in physical function parameters. There was an improvement in ADL (Activity of Daily Living) function represented by the Barthel index, and there was a pain decreased.

Conclusion: The combination of a knee brace, physical modality, exercise program, home exercise program, and knee joint protection education is provide improvements in pain, function, and some aspects of OA health-related quality of life.

Keywords: knee osteoarthritis; varus deformity; rehabilitation

1. Introduction

The knee is the largest and most complex joint in the human body. The knee joint plays an important role in supporting body weight and human mobilization so this joint is very susceptible to injury (Neumann, 2010).

Osteoarthritis (OA) is one of the most common causes of chronic disability in the adult and geriatric population. Among cases of osteoarthritis, the knee is the most common site of osteoarthritis. It is known that 10% of the population aged 65 years and over suffer from knee osteoarthritis. OA can affect both men and women. Before the age of 50 years, men have a higher prevalence than women. On the other hand, after the age of 50, women have a higher prevalence (Frontera et al., 2018).

A physiatrist, or Physical Medicine and Rehabilitation Specialist, will often deal with cases of osteoarthritis due to the increasing prevalence of osteoarthritis globally, especially in long-term outpatient services. In addition, physical medicine and rehabilitation have become known to the public as a branch of medical science that offers comprehensive therapeutic options in the non-operative treatment of various musculoskeletal disorders, including the management of OA cases, through collaboration with various other health professionals such as physiotherapy and

occupational therapy. Based on these facts, a physical medicine and rehabilitation specialist needs to have basic knowledge and skills to treat OA cases, especially knee OA (Sitik et al, 2010).

2. Case Report

A 58 years old female was referred from the Orthopedic department with diagnosed right Osteoarthritis knee grade IV and left Osteoarthritis knee grade II need for Total Knee Replacement. She came to our hospital because of pain in both knees 5 months ago. Pain in the right knee is more severe than on the left side. Pain felt like a dull pain and it felt when she woke up in the morning, followed by stiffness lasting for 3-4 minutes. Pain aggravated when transferred from sitting to standing, standing for a long time, and walking more than 50 m. She also difficult to up and downstairs because of pain. The Visual Analog Scale (VAS) for the right knee was 6, and the left knee was 2.

No radiating pain, no tingling sensation, and no numbness in the upper and lower extremities. Now she independently ambulated. She has hypertension controlled by Amlodipin 5 mg daily. She also got meloxicam 2 times daily to control her pain. She got menopause 5 years ago. She was overweight (> 60 kg) until a year ago. She was a rujak seller since 30 years ago. Due to her condition, she stopped working. Her house just has one floor. She lives with her sons, daughter-in-law, and 3 grandchildren. The Barthel index was 85 of 100.

The vital sign was as follows: BP 110/60 mmHg; HR 88 x/min (regular); RR 18 x/min; Sat 99%. and the joint's range of motion was full except for the right knee joint range was limited in flexion (0-130º). No Sensory deficit was felt. Physical examination revealed a tender point at the medial of the knee, knee crepitation in both knees, a positive patellar grinding test in both knees, and a positive varus test of the right knee. There was atrophy on both vastus medialis muscles. There was a knee deformity varus at the right knee (Figure 1). Q angle of the right knee was 5° varus (Non-weight-bearing) and 7° varus (Weight-bearing). The left knee Q angle was 10° valgus (Non-weight-bearing and Weight-bearing).

(a)  (b) 

Fig. 1. (a) patient standing; (b) varus deformity of the right knee

Fig.2 AP/Lat right/left knee X-ray and skyline view

X-ray examination conclusion (Figure 2) was bilateral grade III femorotibial joint osteoarthritis according to the Kellgren Laurence grading scale, bilateral femoropatellar osteoarthritis, and Bilateral quadriceps femoris tendon enthesopathy

The patient refuses to have surgery because of fear. She was pscicollogically not ready yet to get TKR. While providing motivation to the patient to undergo the surgical treatment, we provide pain management therapy in addition to giving NSAID. We give Short Wave Diathermy (SWD) as a physical modality. Our therapy was SWD contraplanar 12,27 MHz on right and left knee, intensity comfortable warm for 20 minutes, 3 times per week. We prescribe therapeutic exercise active range of motion exercise. We also give isometric quadricep strengthening exercises at first, then gradually give progressive isotonic strengthening exercises to quadriceps muscle (with precaution: prevent valsava due to hypertension). Static cycle 3 until 5 times per week was prescribed to the patient for aerobic exercise. We also prescribe Knee Brace for the right knee and suggest using a cane while walking. We planned to monitor clinical signs, VAS, Blood Pressure, thigh circumference, deformity, and Q angle.

We educate the patient to do a home program including icing at tender point 15-20 area minutes 3 times per day, a home exercise program, and knee joint conservation. Knee joint protection education to the patient is avoiding deep knee bending, using a squat toilet, using stairs, other activity that causes stress to the knee especially when the knee is in pain.

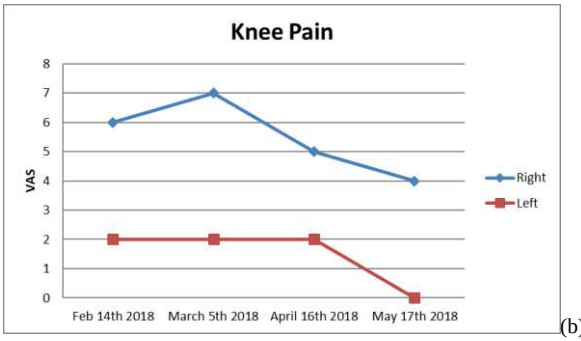
The orthosis prescription was a knee brace with three-point pressure to correct the varus deformity and stabilize the knee joint. The challenge, in this case, was the patient's motivation to use the knee brace is low due to the patient feels heavy, uncomfortable when walking. The price of the knee brace is also too expensive for the patient. We modificate the dynamic cast tailor-made for this patient to her knee joint. We give three-point pressure by molding

the cast according to the shape of her knee (figure 3).

Fig. 3. patient use a modified knee brace

Following the rehabilitation program for 3 months, the patient felt more fit, full right knee range of motion was obtained. She walked more easily with her knee brace and experienced improvements in physical function parameters. There was an improvement in ADL function represented by the Barthel index, and there was pain decreased (figure 4).

(a)



(b)

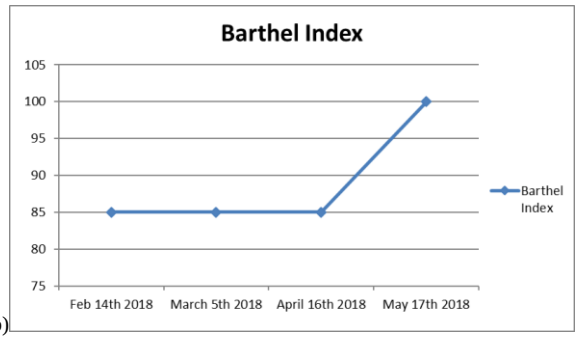


Fig. 4. (a) knee pain; (b) Bartel index

3. Discussion

Rehabilitation medicine has a role in the control and maintenance of the clinical and functional status of people with primary knee osteoarthritis and co-morbidities. We established that the complete rehabilitation program (diet, symptomatic medication, herbal products, electrotherapy measures, and kinetic exercises) will give the optimal healthcare for this type of patient (Traistaru et al., 2019).

Rehabilitation is widely recommended in national and international guidelines for managing osteoarthritis (OA) in primary care settings. According to the 2014 OA Research Society International (OARSI) recommendations, rehabilitation is even considered the core treatment of OA and is recommended for all patients. Rehabilitation for OA widely includes land- and water-based exercise, strength training, weight management, self-management and education, biomechanical interventions, and a physically active lifestyle (Nguyen et al., 2016).

In much other earlier research, the period of the kinetic program is roughly 8 weeks, including strength training, proprioception (equilibrium) and flexibility, knee bracing, and patient education. It is important to include in physical training in symptomatic OA of the knee patients the active motion of all lower limb joints (range of motion and flexibility exercises) and strength exercises, analytic (quadriceps strengthening), and global scheme. Also, balance training is very important for a functional gait scheme. All in-patient exercises have to continue at home (home training) (Diracoglu et al., 2005; Miller et al.,2014; Fransen et al., 2015; Sled et al, 2010; Jansen et al., 2011).

A recent study underlined the fact that expanding TKA (Total Knee Arthroplasty) eligibility increases knee OA-related costs substantially, further reiterating the need for effective nonoperative treatment options. Short-wave diathermy (SWD) is one of the oldest forms of electrotherapeutic modalities traditionally used in the treatment of symptomatic knee OA. SWD is a well-established part of the conservative treatment of knee osteoarthritis (Ozen et al, 2019).

The knee is the weight-bearing joint most commonly affected by osteoarthritis. Bracing of the knee or the foot can be a useful nonoperative and nonpharmacologic treatment for persons with osteoarthritis that predominantly involves either the medial or lateral tibiofemoral compartment. The aim of wedged insoles and realigning the knee braces is to reduce articular contact stress in the more involved tibiofemoral compartment. There is evidence that even knee sleeves that do not have an effect on alignment may confer symptomatic relief and enhance joint position sense. A review summarizing the current state of knowledge concluded that braces in the knee can effectively correct tibiofemoral malalignment, improve knee joint pain, and enhance physical function, and provides clinical recommendations for the prescription of these devices to optimize effectiveness (Segal et al., 2012)

The combination of a knee brace and usual care is statistically associated with improvements in pain, function, and some aspects of OA health-related quality of life at 1 year in comparison with usual care alone. A knee brace seems to be cost-effective, as suggested by the cost-utility analysis (Gueugnon et al., 2021)

4. Conclusion

The role of the rehabilitation program in the control and maintenance of the clinical and functional status of people with primary knee osteoarthritis is important. The combination of a knee brace, physical modality, exercise program, home exercise program, and knee joint protection education is provide improvements in pain, function, and some aspects of OA health-related quality of life.

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