



O-10

PHYSIOTHERAPY MANAGEMENT FOR PATELLAR SUBLUXATION/DISLOCATION: A CASE STUDY

Farida¹, Totok Budi Santosa², Ratih Tiarasani³

^{1,2} *Physiotherapy Department, Faculty of Health Science, Universitas Muhammadiyah
Surakarta, Indonesia*

³ *Clinic Physiotherapy Ibest, Pontianak, Indonesia*

*Corresponding author: Farida, Email: safafaridasapta@gmail.com

Abstract

Introduction: This patellar dislocations have been documented up to 43/100,000 and are more common in women than men. There are many other factors as well that can cause a patellar dislocation involving the hip, knee and ankle.

Case Presentation: Patients describe the pain that is felt intensity up to 7 of 10 on a Numeric Rating Scale (NRS) scale accompanied by a leg that is unable to bend or straightened. Before coming to physiotherapy, the patient never been treated anywhere except for taking pain relieve. The patient also belongs to the obese category with a BMI value of 31.25 (weight 85kg and height 165cm), the weight factor is also one of the triggered. From the examination carried out with the patient in the supine position and then on palpation it found that there was tenderness, motion pain, local temperature and limitation of motion in the the patient's right knee, the presence of tightness in the knee stabilizer muscles. Active and passive range of motion of the patient's knee joint range of motion is only 0°-20°-35° measured with a Goniometer. Anthropometry is used to measure the swelling, the ratio between the right and left sides.

Management and Outcome: This case study it can be concluded that icing, isometric exercise on the quadriceps and hamstrings, and mobilization can reduce pain levels in patients. Stretching and strengthening of the stabilizing muscles of the knee joint coupled with pelvic mobility and walking exercises are able to return the patient's functional activities to normal.

Discussion: Some of the training methods provided are considered to provide significant results for patients. From the evaluation results, it was found that there was a decrease in pain as reported by the patient, an increase in ROM in the knee joint, and an improvement in functional activity from the analysis of scores on the womac index.

Conclusion: Six therapy sessions applied in this case showed significant results in patients with patellar subluxation/dislocation.

Keyword: *Isometric exercise, physiotherapy, patellar dislocation, stretching, strengthening, injury.*



Introduction

Patellar subluxation or dislocation can occur repeatedly, because of daily functional activities or during exercise. This patellar dislocations have been documented up to 43/100,000 and more common in women than men. There are many other factors as well that can cause a patellar dislocation involving the hip, knee and ankle. The position of patellar moving laterally may be indicated because of weakness in the Vastus Medialis Oblique (VMO) and adductor muscles, tightness in the iliotibial band and imbalance in the vastus lateralis. High Body Mass Index (BMI) is one of the most common triggers of patellar dislocation.

Case Presentation

A 25 year old woman comes to the Ibest physiotherapy clinic using 2 crutches. With complaints of pain in the right knee and swelling of the knee. And then patient tell the chronology of the incident, about 3 weeks ago the patient fell or slipped while getting out of the bathroom. Patients describe the pain that is felt to have an intensity 7 of 10 on a Numeric Rating Scale (NRS) scale accompanied by a leg that is unable to bend or straightened. Before coming to physiotherapy, the patient never been treated anywhere except for taking pain relieve. The patient also belongs to the obese category with a BMI value of 31.25 (weight 85kg and height 165cm), most likely the weight factor is also one of the triggered. And patient familys not the same history as the patient. The patient is able to tell in a coherent chronological of the events his experienced, the environmental factors of the house such as slippery floors and rooms with poor lighting are one of the causes of this incident. But the patient is very active and enthusiastic while undergoing a therapy session, the patient also carries out the education given by the therapist exercise at home so that the therapeutic results obtained are also maximal.

Table 1. General Examination

Examination type	Examination Results
1. Palpation	Tighness M. vastus Medial Oblique, Illiotibialband, gluteus and Illiopsoas
2. Knee ROM dextra (goniometer)	S (0°-20°-35°)



3. Pain (NRS)	Static pain: 7 Tenderness Pain: 7 Motion pain: 7
4. Functional (WOMAC Index)	80% (severe category)

Table 2. Specific Knee Joint Examination

Test Specific	Results
Anterior Drawer Test	-
Posterior Drawer Test	-
Pivot Test	-
Mc Murray	-
Hyperextension	-
Gravitiesign	-
Lachman Test	-
Appley Test	-
Ballotement Test	+
Knee Varus Test	-
Knee Valgus Test	+
Patella Compression	+

From the examination with the patient in the supine position and then on palpation be discovered tenderness, motion pain, local temperature and limitation of motion in the the patient's right knee, the presence of tightness in the knee stabilizer muscles. Active and passive range of motion of the patient's knee joint range of motion is only 0°-20°-35° measured with a Goniometer. Anthropometry is used to measure the swelling, the ratio between the right and left sides. Subluxation/dislocation of the patellar also greatly affects the patient's functional activities.



The patient can't squat for too long such as when going to defecate or other daily activities. So that the therapist measures the limitations and dependence of the patient's functional activities with the Womac Index as a reference for assessment. From the calculation of this observation, 80% of the results were obtained, which means that the patient is categorized as having limitations and severe dependence on functional activities. Then the therapist also a specific examination done at the third meeting when the swelling had started to decrease. To support the results of the diagnosis, spesific test with positive (+) results; Knee Valgus Test, Ballotement test and Patella Compression.

Management and Outcome

Table 3. Treatment for Patellar Dislocation Cases

Therapy Sessions	Treatment
Therapy 1 & 2 (Week 1)	Icing, Isometric Exercise and Mobilization With Movement.
Therapy 3 & 4 (Week 2)	Isometric Exercise, Hamstring Stretching, Hamstring Curls, Mobilization With Movement, Pelvic Mobility Exercise, Squat,
Therapy 5 & 6 (Week 3)	Isometric Exercise, Hamstring Stretching, Hamstring Curls, Mobilization With Movement, Pelvic Mobility Exercise, Squats, Walking Exercises.

Patients are scheduled to eight therapy sessions with a duration of twice per week. However, the therapy session was stopped at the sixth meeting when the patient was required to rest by the obstetrician because of the young pregnancy and the condition of the fetus which was still prone to strenuous activities. The patient underwent therapy consisting of icing, isometric quadriceps and hamstring exercise and mobilization at the first and second meetings. The third and fourth meetings or the second week, the therapist gave the same type of exercise in the first week with additional hamstring stretching, hamstring strengthening (using the eccentric type of hamstring curls method and prone lying position), pelvic mobility exercises, squats, and walking exercises.



And then at the fifth and sixth meetings or the third week the icing isn't given, the practice is still the same with second week. In the first week at the second appointment, the patient to walk with one crutch but the knee still swollen and pain. At the fifth meeting the patient reported that the pain completely gone but the knee still swollen and feel hot. The sixth appointment, the patient to walk without crutches. But the results obtained don't maximal, if the patient passes the therapist session, the hamstring muscles still seem a little re-concentric.

Isometric exercise are given to decrease on pain and swollen, increase strength of the hamstring and quadriceps muscle as knee joint stability. Hamstring curls exercise, squats to strengthening for hamstring muscle and leg . And walking exercise for normally functional activity. All the result from examination can be see at Result of Evaluation (table 4).

Discussion

This study case a problem experienced by a patient, that is patellar subluxation/dislocation. Some of the exercise methods provided are considered to provide significant results for the patient. From the evaluation results, it was found that there was a decrease in pain as reported by the patient, increase ROM in the knee joint, and improvement in functional activity from the analysis of scores on the womac index.

Table 4. Results of Evaluation

Examination	Therapy 0 (Initial)	Therapy 6 (Final)
Pain (NRS)	Static Pain: 7	Static Pain: 0
	Tenderness Pain : 7	Tenderness Pain: 0
	Motion Pain:7:	Motion Pain: 0
ROM (Goniometer)	S (0°-20°-35°)	S (0°-5°-110°)
Functional (WOMAC Index)	80% (severe category)	20% (mild category)

Conclusion

From this case study it can be concluded that icing, isometric exercise the quadriceps and hamstrings, and mobilization can reduce pain levels in patients. Stretching and strengthening of the stabilizing muscles of the knee joint coupled with pelvic mobility and walking exercises to return

the patient's functional activities to normal.



ACADEMIC
PHYSIOTHERAPY
CONFERENCE
Physiotherapy Universitas Muhammadiyah Surakarta
Saturday-Sunday, 21-22 Agustus 2021

“Innovation of Physiotherapy Community on Increasing Physical Activity during Pandemic Covid-19”

Jl. A. Yani, Mendungan, Pabelan, Kec. Kartasura, Kabupaten Sukoharjo, Jawa Tengah 57169

Acknowledgments

A big thanks to the Pontianak IBEST Physiotherapy Clinic for the time and opportunity given to me. And a special thanks to Ratih Tiarasani who has patiently shared her knowledge with me.

References

1. Anzari N. An intervention study on the effectiveness of isometric quadriceps hamstrings exercise in the treatment of osteoarthritis, knee joint. *International Journal of Orthopedic Sciences*. 2018; 4(2): 1010-1014
2. Alghadir AH, Anwer S, Iqbal A, Iqbal ZA. Test–retest reliability, validity, and minimum detectable change of visual analog, numerical rating, and verbal rating scales for measurement of osteoarthritic knee pain. *Journal of Pain Research*. 2018;11 851-856
3. Alkhafae HA and Alshami AM. The effect of mobilization with movement on pain and function in patients with knee osteoarthritis: a randomized double-blind controlled trial. *BMC Musculoskeletal Disorders*. 2019. 20:452
4. Ayala A, Bilbao A, Perez SG, Escobar A, Forjaz MJ. Scale invariance and longitudinal stability of the Physical Functioning Western Ontario and MacMaster Universities Osteoarthritis Index using the Rasch model. *Rheumatology International*. 2017. <https://doi.org/10.1007/s00296-017-3901-4>
5. Espi-Lopez GV, Arnal-Gomez A, Balasch-Bernat M, Ingles M. Effectiveness of manual therapy combined with physical therapy in the treatment of patellofemoral pain syndrome: a systematic review. *J Chiropr Med*. 2017;16(2):139–46
<https://doi.org/10.1016/j.jcm.2016.10.003>.
6. Grimm NL, Levy BJ, Jimenez AE, Crepeau AE, Pace JL. Traumatic Patellar Dislocations in Childhood and Adolescents. *Orthop Clin N Am* 51. 2020 : 481–491
7. Hsu WH, Fan CH, Yu PA, Chen CL, Kuo LT and Wei Hsu RW. Effect of high body mass index on knee muscle strength and function after anterior cruciate ligament reconstruction using hamstring tendon autografts. *BMC Musculoskeletal Disorders*. 2018. 19:363
8. Jaquith BP, Parikh SN. Predictors of recurrent patellar instability in children and adolescents after first-time dislocation. *J Pediatr Orthop* 2017;37(7):484–90
9. Kangeswari P, Murali K and Arulappan J. Effectiveness of Isometric Exercise and Counseling on Level of Pain Among Patients With Knee Osteoarthritis. Sagepub. 2021. DOI: 10.1177/2377960821993515
10. Malanga GA. Patellar Injury and Dislocation. *Medscape*. 2017. <https://references.medscape.com/article/90068-print>



11. Sanders TL, Pareek A, Hewett TE, Stuart MJ, Dahm DL and Krych AJ. Incidence of First Time Lateral Patellar Dislocation: A 21-Year Population-Based Study. Department of Orthopedic Surgery. 2017. DOI: 10.1177/1941738117725055
12. Sanders TL, Pareek A, Johnson NR, et al. Patellofemoral arthritis after lateral patellar dislocation: a matched population-based analysis. *Am J Sports Med.* 2017;45(5):1012–7
13. Scafoglieri A, Broeck JV, Willems S, et al. Effectiveness of local exercise therapy versus spinal manual therapy in patients with patellofemoral pain syndrome: medium term follow up results of a randomized controlled trial. *BMC Musculoskeletal Disorders.* 2021. 22:446
14. Smith BE, Selfe J, Thacker D, Hendrick P, Bateman M, Moffatt F, et al. Incidence and prevalence of patellofemoral pain: a systematic review and meta-analysis. *PLoS One.* 2018;13:e0190892.
15. Ye Q, Yu T, Wu Y, et al. Patellar instability: the reliability of magnetic resonance imaging measurement parameters. *BMC Musculoskeletal Disorders.* 2019;20(1):317