
REHABILITATION TO RECRUIT VMO IN PATELLA FEMORAL

STRESS SYNDROME

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ABSTRACT

Knee joint is the most complex joint in human body. Patello femoral joint is the joint where the femur meets in front of the knee. It accounts for 25% to 40% of all knee problems seen in sports medicine centers and 6-30% in the general population suffers from patella femoral pain syndrome. An activity of daily living like climbing stairs, walking, kneeling and squatting works the patello femoral joint as the maximum possible. Avoid or restrict the activities that increase the pain, such as climbing stairs, kneeling or squatting. Aim of this article is to enumerate the rehabilitation exercises to strengthen the VMO. Different types of exercises are presented here to improve the stability of VMO.

Keywords: Knee joint, VMO, Patello femoral joint, Rehabilitation, exercise.

I. INTRODUCTION

1.1 Patella femoral stress syndrome

Unpleasure sensation or feeling of pain in the knee joint and its surrounding area due to abnormal pressure between patella and femur is called patella femoral stress syndrome. The main etiological factors are frequent activities like jogging, squatting and climbing stairs that produce repeated stress on the knee. The main clinical feature is pain and it increases during or after any activity. VMO (Vastus Medialis Oblique) is located in front of the thigh and it is the part of quadriceps muscle group. This muscle is used to extend the leg at the knee and to stabilize the patella.⁵

Rehabilitation is the therapeutic process of restoration of physical, psychological and social functional ability which is/are lost due to injury or illness. Main goal of rehabilitation is to regain the maximum functional ability and increase the wellbeing of the individual. It also aimed to initiate early mobilization and to minimize the inflammation which causes immobilization.

1.2 VMO (Vastus Medialis Oblique) Muscle

Vastus medialis oblique is the type of quadriceps muscle which is located in front of the thighs. Size of this muscle is extended up to the length of the thigh. The important function of this muscle is extending the leg at the knee stabilizing the patella or kneecap. This muscle is fully activated when the leg is completely extended with knee extension in greater angle.

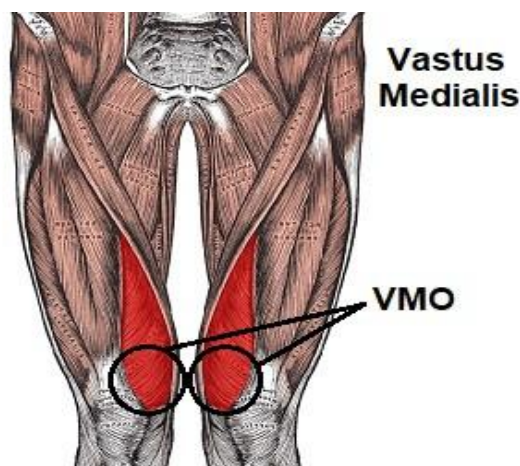


Fig-1

II. REVIEW OF LITERATURE

Wen-Dien Chang et.al.(2015) conducted a study to examine the changes seen in thigh muscles of patients with patella femoral syndrome by using sling based exercises. Open and closed kinetic knee extension and hip adduction exercises were given as intervention. Voluntary muscle contraction during exercise was measured by using electromyography. Sample size was 60 among that 30 males and 30 females were recruited. Result shows VMO activations during open and closed kinetic knee extension exercises were significantly higher than during hip adduction exercises. But both exercises are helpful to strengthen the thigh muscles. ⁴

Anamika Bhatt, Moazzam Hussain Khan (2015) conducted a review regarding evidences for best possible exercises and methods of VMO strengthening among patients with patella femoral pain syndrome. The review concludes that closed kinetic chain exercises are more effective for strengthening and activation of VMO muscle. It can be performed with different methods such as taping, bio feedback, motor imagery etc.. The review also shows higher levels of correlation between rehabilitation exercises and reduction of pain with enhancement of functional wellbeing among the patients.⁶

III. METHODS

Rehabilitation to recruit VMO

3.1 Isometric exercises

- Hip adduction exercises

Squeeze the knees together with a ball or pillow between both knees up to 10 seconds and relax the knees. Repeat it 5 times in one cycle. It should be done 2 to 3 cycles per day.

- Inner thigh exercise

Roll an elastic band around the lower thighs. Lie on right side with bent knees. Then slowly open the left leg as far as possible. Hold this position up to 5 seconds and then lower back down to the starting position. It should be done 2-3 sets of 8-16 repetitions on each side.

- Isometric contraction

Sit with leg passively extended. Rotate the tibia internally with making any rotation in the thigh. Gently turn the leg towards external rotation, thereby externally rotating the tibia. Isometric contraction should be maintained for 4-5 seconds, and then stop the contraction. Wait for tissue relaxation approximately 4-5 seconds. The sequence is repeated twice a day.

3.2 Open chain exercises

- Terminal knee extension exercises

Sit with the tighter leg straight out. Bent the healthy leg while the foot resting on the ground. Prop up hands or lean against a wall. Squeeze the quad muscle by pressing the back of the straight leg against the ground. Hold it for 5 seconds and relax it as rest for 10 seconds. Perform 5 to 8 cycles twice a day.

- Hamstring curl

Lie on supine position and Put the calves and heels on a stability ball. Move the hips upward until the body is straight. Slowly lift the hips and bend the knees. Then extend the knees and lower the hips and back to the floor. Repeat it for 8 to 10 times.

3.3 Closed chain exercises

- Knee extension

Palpate the VMO muscle in sitting position (sitting in a chair or floor). Slowly straighten the knee and ensure the VMO muscle on inside of the thigh contracts. Extend the knee fully and bend it again. Maintain the contraction throughout the movement. Turning the leg outwards can help to keep more load on the VMO muscle when straightening the leg from a bent knee position. Repeat it 5 times in a cycle twice daily.

- Heel drops

It helps to integrate the contraction with functional movements. Stand on a step and drop the heel forwards off the step to slightly bend the knee. Don't go too far, just enough to feel the VMO contracting. It is important to keep the knee in a straight line and control the hips.

- Stepping machine/leg press - It develops cardiovascular fitness, and burn calories.
- Plyometric jump - Examples are jumping rope, clap push-ups and skipping.
- Cycling - It is a good exercise to increase functional mobility of the knee joint and strengthen the muscles.
- VMO squat - It can be done by standing with feet about shoulder width apart, and turn the feet outward about 45 degrees.

IV. CONCLUSION

VMO is a quadriceps muscle located above the knee joint and front side of the side. The nature of this muscle is oblique fiber type. Injury or weakness of this muscle produces biochemical imbalances due to tight structure. It leads to knee pain and it affects the activities of daily living. Strengthening of this muscle is the important part of knee rehabilitation. Rehabilitation exercises helps to prevent atrophy of VMO and increase the strength of quadriceps. Rehabilitation exercises play a major role in strengthening the thigh muscles such as quadriceps including vastus medialis oblique and hamstrings which helps to reduce knee pain.

V. REFERENCES

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