



THE ROLE OF PHYSIOTHERAPY IN THE REHABILITATION OF LEGS' MUSCLES AFTER DEVELOPING VARICOSE VEINS

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Abstract:

The blood returned to the heart from the foot, leg, and thigh is carried out via the lower limb venous system. The incapacity of the blood to fully return as a result of anatomical or functional anomalies in the lower leg veins is known as chronic venous illness. Veins that have been big and unusually swollen are known as varicose veins. The purpose of this study was to assess, identify, and treat varicose veins using physiotherapy techniques. The patient had significant varicose veins when they first arrived to our outpatient service. After an evaluation, a customized two-month rehabilitation program was created for her. This study contributes to our understanding of the disorder, its prognosis, and how physiotherapy techniques are used to manage it.

Keywords: Physiotherapy intervention, Rehabilitation, Varicose Veins

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1- Introduction:

The venous system is a vital part of the circulatory network owing to its ability to constrict and dilate, store large volumes of blood for use in other areas, and even regulate cardiac output. [1] Varicose veins are abnormally swollen, dilated and tortuous sub-cutaneous veins. The American Venous Forum developed a detailed descriptive classification system for chronic venous disorders in 1994, which was published in 25 journals and books. It was based on clinical manifestations (C), etiological factors (E), the anatomic distribution of disease (A), and underlying pathophysiological findings (P). In 2004, the advanced CEAP classification system was published. [1] The etiology of varicose veins is still only partially understood; the occurrence of varicose veins may be due to primary venous disease or intrinsic morphologic or biochemical abnormalities in the venous wall. Varicosities can also develop as a result of secondary causes, such as previous deep vein thrombosis (DVT), deep venous obstruction, superficial thrombophlebitis, or arterio-venous fistula. Varicose veins may also be congenital and present as venous malformations. [2] The incidence of varicose veins increases with advancing age and is relatively higher in females and those with a family history of varicose veins. Obesity, especially in women, smoking and prolonged standing at work, are considered potential risk factors for varicosities. [3] Varicose veins are considered a prevalent disease affecting all age groups from teenagers to elderly people. The occurrence of varicose veins varies worldwide, with reported incidence rates ranging from 20% to 64%. The highest reported rate is in the Western world. Among women older than 18 years, the prevalence of varicose veins has reached 49.6% and 47.7% in Saudi Arabia and Iran, respectively. Among pregnant women, the prevalence of varicose veins varies widely from 20 to 50%, and it may reach 70% of women if all types of varicose veins are included, such as telangiectasias. Varicose veins occur during pregnancy due to the enlarged gravid uterus and the resulting hypertension and distension in the lower extremity veins and an increase in hormone secretion, which weakens the venous wall. [4] Patients with varicose veins may present with no symptoms except those of cosmetic concern, which have a psychological impact that may reduce the patient's quality of life. Other patients report symptoms related to varicose veins such as tingling, aching, burning, pain, swelling, the sensation of heaviness, restless legs, leg tiredness, and fatigue. [5] Hence, varicose veins are considered a problem with substantial psychological, physical and financial impacts

because they affect work efficiency and lead to increases in disability and costs of treatment. Therefore, it is necessary to plan to control the risk factors and prevent complications.

Physiotherapy and rehabilitation have recently seen many practical innovations, evidences and major developments for specific interventions, not only in practical but also conceptual. [6] The approach to patients has moved from a predominantly medical biopsychosocial aspect and the need for organized specialist rehabilitation services has become equally important. [7] Physiotherapy is directed towards the movement necessities and potential of individuals, providing therapy and rehabilitation to enhance, maintain and restore maximum movement and functional skills throughout the lifespan. [8] Recent studies including systematic reviews and randomized controlled studies have emphasized proof for the clinical activity of physiotherapy interventions and rehabilitation for individuals with large different conditions range as orthopedic, neurologic, pulmonary, pediatric, rheumatologic or geriatric conditions. [9]

The World Health Organization (WHO) describes rehabilitation as a process that supports individuals, experience or are under risk of functional limitation, to provide, enhance and maintain functionality in interaction with their environments' [10] and rehabilitation is based on way of thinking on problem-solving and fundamental decision-making in clinical interventions and apply learning. The problem-solving approach is based on description of symptoms in relation to structural and functional impairment and activity and participation limitation rather than only a specific description of different conditions related to physiotherapy. "Physiotherapy and rehabilitation" are therapy process that are aimed to optimize functional and independence level and individual function limitations caused by pathologies which result in impairments. Rehabilitation is mainly focused the results of pathology rather than pathology itself. Physiotherapy and rehabilitation focus particularly on limitations which may affect physical functionality and activity and utilize a set of different interventions based on non-invasive and physical nature to assist progress toward functional objectives and aims. [11] Physiotherapy and rehabilitation are mostly focused on impairments related to mobility and functional or activity limitations as well as pain which are associated with musculoskeletal and neurological pathologies, injuries such as fractures and traumas, or cardio-pulmonary problems and treating them with exercises planned in line a target and manual mobilization approaches. [12] There are very few

studies that determine a rationale-based physiotherapy protocol for the treatment of this condition. Hence, this report is put forth to set a standard treatment protocol for the condition with proper rationale for each intervention and physiological changes that will be brought about by those interventions.

2- Case Report:

A 53-year-old female who was operated by vein ligation and stripping for varicose veins in left leg in October 2021 visited our outpatient department with chief complaints of leg pain and knee pain for 5–6 months along with the prominence of veins in both legs. She experienced throbbing and aching pain which was aggravated by standing for hours, long sitting, stair climbing, and walking more than 1 km. The intensity of this pain, as noted using the Numeric Pain Rating Scale (NPRS), was 8/10 during activity and 5/10 at rest in the right leg and 5/10 during activity, and 3/10 at rest for the left leg. She lived on the 2nd floor with no lift facility and hence had to climb 20–22 steps of average height daily.

The patient had antalgic gait and swelling in the left foot. Her cadence was reduced to 54 and BMI was calculated to be 26.25 which is overweight. She experienced Grade 2 tenderness in both legs. The movements of lower limb were found to be strong and painful. The patient's active hip flexion and extension ranges were reduced to 40° and 25°, respectively, on both sides. Hip abduction, adduction, and knee and ankle ranges were full. The strength for hip flexors, hip extensors, hip abductors, knee flexors, and knee extensors was 3/5 according to manual muscle testing grading on both sides. Core muscle testing revealed that upper abdominals had Grade 4 strength, lower abdominals had Grade 2, whereas the back strength was Grade 2. Her thoracic expansion and chest excursion were reduced at the nipple and xiphisternal level.

For diagnosing the condition, the venous filling time was noted which was calculated as 10 s. Hence, venous disease was suspected. Following this, the Trendelenburg test was done. The filling time was 43 s and veins appeared distended before the removal of the tourniquet. Hence, varicose veins were confirmed by the therapist. Considering all the history and assessment, a proper patient-specific intervention program was formulated for this patient by the therapist. This protocol was given for 2 months with progression in exercises when needed. At the end of 2 months, the enlarged veins were no longer of the same size, and also discolorations had reduced. The knee pain subsided

completely and leg pain NPRS was reduced to 2/10 during activities and no pain at rest.

3- Discussion:

This study was done to formulate a well-established protocol in treating varicose veins and its physiological effects on the body. The therapist in this study first educated the patient about her condition and therapist goals in treating the same. The patient was also informed about the expected recovery time, and prior consent was taken. This was done to keep her motivated throughout the treatment. Patient education also allows the patient to get knowledge about disease management and hence adjust to the treatment protocol for betterment in quality of life. [13]

The patient was given ergonomic advice so that the patient would not undergo any aggravation in pain. By combining proper ergonomic advice with the treatment, the therapist can target both intrinsic and extrinsic factors causing the discomfort. [14] Since the patient was overweight, weight management was done as overweight or obesity is one of the risk factors for a person with varicose veins. This is because the foot is too heavy to support the body and hence, veins need to work more effectively and more power is needed to pump blood toward the heart and hence higher chances of stasis of blood. [15]

For reduction of leg pain, contrast bath was used for alternate immersion in hot and cold baths for 15–20 min. This causes alternate vasoconstriction and vasodilation of the vessels by the modality and hence improves circulation and this, in turn, helps to reduce pain in case of varicosities. [16]

To improve circulation, low-level cold LASER was used for 10 min. This LASER works effectively for reducing pain by improving circulation and releasing nitric oxide in the microcirculation that would in turn prevent pain and comfort the patient. This also helps in lowering the level of biochemical markers and oxidative stressors. [17] Regular physical activity helps to maintain muscle tropism which is important to maintain the efficiency of the venous pumps, and hence the use of elastic varicose veins stockings during walking was encouraged as this increases venous working pressures between the skin and stocking. [18]

To improve circulation, Berger's exercises were implemented in different positions of lower limb, in which gravity would assist blood flow. Ideally, 720 repetitions of ankle-toe movements are needed regularly to prevent stasis. Our protocol focused on performing 810 repetitions daily. This leads to the effective functioning of collateral circulation to prevent stasis. Studies have demonstrated that exercising enhances microvascular endothelial

function, resulting in increased venous flow. Blood flow acceleration is due to muscular contractions that squeeze intermuscular veins and intramuscular venous networks. A coordinated chain of muscular pumps is sequentially activated during walking, and respectively, activating the plantar, calf, thigh, and gluteal pumps. Hence, toe walking and heel raises have shown effect. [19]

For reduction of knee pain and maintaining the strength of associated areas, isometric contractions of hamstrings, quadriceps, abductors, adductors, and gluteus muscles were performed. This causes recruitment of muscle fibers in response to increased intramuscular tension. Furthermore, 30% strengthening can be done with isometric recruitment of muscles as strong muscles protect the joint, and weak muscles lead to joint dysfunction and pain. Small amplitude oscillatory glides were given for pain management as they inhibit mechanoreceptors that transmit nociceptive stimuli to the spinal cord. The glides also improve nutrition to the joint and remove pain-causing enzymes. [20] To improve thoracic mobility, trunk rotations and side flexions were done, 10 repetitions on each side. Along with this, the patient was taught diaphragmatic breathing to reduce the work of breathing and improve oxygenation to all parts of the lungs.

4- Conclusion:

Specific physiotherapeutic protocol was effective in the treatment of varicose veins for the case we presented. Protocol must be formulated with proper assessment before starting the treatment considering all factors associated. To the best of our knowledge, there are no published studies with a clear regimen to treat varicose veins, and hence this study would contribute to enhancing knowledge of health-care practitioners and students.

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