

# Allen Buerger's Exercise on Peripheral Vascular Disease

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**Abstract-** Allen Buerger exercise is an effective exercise against the obstructed lower extremity perfusion. The disease condition peripheral vascular disease is a condition in which the blood flow in the arteries altered due to certain reason like plague or arteriosclerosis the condition leads to furthermore complication. In this article the author discussed about the introduction, causes, types of peripheral vascular disease, symptoms, diagnostic test, management, Allen Buerger exercise.

## I. INTRODUCTION

The peripheral vascular disease is the disease condition of blood perfusion. The disease condition may include like blockage, spasm, blood supply narrowing towards heart and brain. The narrowing of the blood circulation happens in the arteries and veins. The disease condition causes pain generally in legs most often during performing the exercise.

Furthermore, if there is alteration in blood supply it may alters the oxygen saturation inside the arteries, veins and that leads to decrease level of oxygen depletion in tissues and cells. The major body parts which affected through this alteration are legs, renal system, abdominal and intestinal blood flow. The narrowing of the blood circulation pathway and stiffness in the muscles may due to plague or thrombus formation in the blood vessels that restrict the blood flow and oxygen supply.

The thrombus accumulation in the blood stream further grown and develop partial or complete obstruction in arteries that limits the blood supply in the organs and limbs.

The complication of the disease condition if not treated on time leads to cell or tissue necrosis and proceed to damage of organs and loss of particular body part.

The peripheral vascular disease only affects the arterial blood supply, oxygenated blood perfuses in arteries.

## TYPES OF PERIPHERAL VASCULAR DISEASE

- Functional peripheral vascular disease
- Organic peripheral vascular disease

In functional PVD, there is not any physical damage occurs in the blood stream structure. There is narrowing and widening of the shape of vessels. The symptoms include change in body temperature and brain impulses. Aetiology consists of extreme low temperature, stress, electronic vibratory instruments, drugs.

On other hand organic PVD includes inflammation, thrombus or plague formation and damage in tissues. Aetiology includes diabetes mellitus type 2, high serum cholesterol level, hypertension, cigarette smoking.

Other aetiological factors included severe trauma in arteries, muscles and ligaments inflammation of blood vessels and due to certain infection.

## II. RISK FACTORS OF PERIPHERAL VASCULAR DISEASE

- Age above 50 years
- Obesity
- High cholesterol level
- Cerebrovascular disease
- Cardiac disease
- Diabetes mellitus type 2
- Hereditary factor
- Hypertension
- Renal disease on hemodialysis
- Sedentary life style
- Cigarette smoking

### III. SYMPTOMS OF PERIPHERAL VASCULAR DISEASE

- Gangrene formation
- Necrosis of cell and tissues
- Claudication: Inadequate blood perfusion condition leads to limits the blood flow. Claudication is the most often symptom of peripheral vascular disease.
- Pain in lower extremities
- Peripheral oedema
- Cellulitis
- Bluish or reddish color of skin

### IV. COMPLICATIONS OF PERIPHERAL VASCULAR DISEASE

If the condition of peripheral vascular disease untreated or not diagnosed on time it can be serious health problem or even life threatening. Obstruction in blood flow can be the serious warning signs of other type of vascular disease.

Other complications included:

- Cell or tissue death that further lead to amputated limb
- Pallor skin
- Occurrence of pain during rest or movement time
- Extreme level of pain that obstruct the physical mobility
- Delay or slow wound healing process
- Spreading of infection to the blood or septicemia
- If the obstruction increases in arteries that may lead to obstruction in the blood flow of vital organs like brain stroke, cerebrovascular accident and even heart attack.

### V. DIAGNOSTIC EVALUATION

- Doppler ultrasound
- Ankle brachial index
- Angiography
- Magnetic resonance angiography
- Computer tomography angiography

### VI. MANAGEMENT

Medical management

- Cilostazol or pentoxifylline
- Aspirin
- Atorvastin
- Angiotensin converting enzyme inhibitor

### SURGICAL MANAGEMENT

- Amputation
- Angioplasty
- Vascular surgeries
- Vein grafting

### VII. ALLEN BUERGER'S EXERCISE

The Buerger's exercise was proposed by Leo Buerger and it is modified by Arthur Allen. This exercise was formulated against those who are suffering from lower extremity insufficiency. Patients with Diabetes Mellitus type 2 having higher incidence and prevalence rate all over worldwide. Globally the estimated percentage of Diabetes Mellitus in year 2011 was at 8.3% that will be raised to 9.9% by the year 2030. Worldwide over 350 million population affecting from Diabetes Mellitus. The basic mechanism for the Buerger's exercise using gravitational force during changing the position of patients which is to applied on smooth muscles of vessels. The gravitational force helps the blood columns to fill up and emptying alternatively which helps to increase the perfusion of blood through them.

### VIII. ALLEN BUERGER'S EXERCISE

#### DEFINITION

Allen Buerger's exercise: it refers to active postural exercise administered to improve the peripheral circulation.

#### PURPOSE

The main purpose of performing this exercise is to improve the lower extremity perfusion and reduce the risk of diabetic neuropathies, or lower limb insufficiency.

#### ARTICLES

- Sphygmomanometer
- Blanket
- Pillow
- Bed

## IX. METHOD

- The client lying on the bed with elevated legs up to 45° till the skin appears pale or blanch for 2 minutes. Then patient should sit on the edge of the bed and feet will towards the down position or in hanging down position.
- Now the exercises like flexion, extension, dorsiflexion, plantarflex, abduction, adduction of the feet and following by toes performing by the patients.
- The next phase includes that patient should remain for at least 2 minutes as same till the redness or rubor has appearing on legs.
- Atlast the patient will lie in supine position and feet covers with warm blanket for 5 minutes. Each cycle of steps should perform by the patients for at least 3 to 5 times in a day for 5 days.

## X. MECHANISM OF ACTION

The role of gravitational force in this exercise plays an important role during changing the position that may cause alternatively emptying and filling the blood vessels.

During exercise the elevation of legs in which the gravity helps to emptying the veins that enhance the blood supply in the right atrium so that furthermore increase cardiac output.

At the legs independency gravity will enhance the blood flow to the arterioles.

## XI. BENEFITS

- Helps to improve the collateral circulation
- Reduce the peripheral neuropathy symptoms in diabetes mellitus patients
- Enhance the walking ability
- Helps after post-operative surgeries like orthopedic surgeries and gynecological surgeries to improve local blood circulation
- Buerger Allen exercise effective as prophylactic exercise for diabetes patients to prevent diabetic foot

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