IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

POST-OPERATIVE COMPLICATION ASSOCIATED WITH ORIF IN LOWER LIMB AND ITS PHYSIOTHERAPY MANAGEMENT (DEEP VEIN THROMBOSIS)

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Abstract

Background: The development of a thrombus, or blood clot, in a deep vein is known as deep vein thrombosis(DVT).Thrombophlebitis, another name for clot, is an condition in which vein becomes inflamed. The leg's femoral vein or popliteal vein are frequent affected in DVT. Pulmonary embolism (PE), an major cause of DVT which mainly occur when lungs get affected due to blood clots. Medical emergency can also occur because pulmonary embolism is an life threatening condition**. Treatment:-**DVT affect the elderly population, with an slight male sex preferences. Clinically symptoms vary based on obstruction and blood vessel wall inflammation and are often asymptomatic. Diagnosis of DVT is based on some popular test. These test are D-dimer test and compression . **.** Ankle pumps, Knee motion, heel raise, Straight leg raise these are the treatment which were given to the patient for the treatment of DVT. **Results**: DVT is an clinical condition that carries some risk because it can result in pulmonary embolism, as a result it requires prompt diagnosis and treatment . DVT, consulting a physiotherapist for DVT treatment and prevention is the recommended plan of action if you are prone to the condition. Physical therapists have extensive knowledge of the anatomy and the responses of the body to various stimuli. Being active is the first step in treating DVT**.** Ankle pumps, Knee motion, heel raise, Straight leg raise these are the treatment which were given to the patient for the treatment of DVT

Keyword

DVT; D-dimer test; Thrombus; Venography; Embolism, Ankle toe , Heel Raise, Knee Motion straight leg raise tech(SLR)

Introduction:-

A-spot where bone tissue is no. completely continuous. Fracture is the medical term for this condition, which can affect any bone in the body. There are numerous ways that bones can shatter, including closed fractures, which do not harm the surrounding tissue.

Due to the increased danger of infection in compound fractures, which also damages surrounding tissue and penetrates the skin, they are more serious than typical fractures.

A surgeon uses a medullary nail, plate, and screw for broken bone reduction and internal fixation. When the bone fracture has breached the skin, it is utilized to heal badly displaced or open bone fractures. A procedure known as open reduction and internal fixation (ORIF) is performed to stabilize and cure shattered bones. Open reduction contrasts with closed. reduction, which can be accomplished without requiring surgery, in that the damaged bone is corrected during the "open" technique of surgery.Internal fixation describes the devices (screws, plates, or rods) utilized to stabilize the bone.ORIF is a two-stage operation that is completed in a single step.

In the final stage, the fractured bone is corrected and repositioned. This is what we mean by fracture. Reduction
Metal implants are utilized to hold the fractured bone together during the second step, also referred to as internal fixation the surgeon places the metal implant inside or on top of the broken bone. These hold the bone in place as the fracture heals. Bone alignment is only ideal in clean wounds.

In some cases, your consultant may use external fixation (metal pins in the bone above and below the fracture site held together with rods like scaffolding) to stabilise the bone while it heals. The pins and screws project out of the skin and are attached to metal or carbon fibre bars. They are removed once the bones are sufficiently healed or are ready to be changed to internal fixation devices.

After postoperative care, osteomyelitis infection, malunion, delayed union, joint stiffness, myositis ossification, and osteonecrosis, deep vein thrombosis is a more frequent complication (1).

Second-worst scenario, if the infection cannot be managed and your life is in jeopardy, the limb may need to be amputated. It is essential to make an effort to prevent infection because of this. The surgically repaired bone will be immobilized with a sling, cast, or splint following the treatment to allow the fracture time to heal. How quickly you recover depends on a number of factors, including your age, the severity of the fracture and skin damage, the presence of an infection, and other factors. Following surgery, you can be prescribed a course of antibiotics and get physiotherapy to assist prevent(2)

In prosperous countries, venous thromboembolic disease is thought to affect one in 1000 persons annually.1 Although it can occur in other veins, such as those in the brain, limbs, retina, and mesentery, deep vein thrombosis of the leg is the most common symptom of the disorder.
It will cause death if it is not treated quickly. One of the morbidities linked to deep vein thrombosis is the post-thrombotic syndrome, which is brought on by chronic venous hypertension and results in limb discomfort, swelling, hyperpigmentation, dermatitis, ulcers, venous gangrene, and lip dermatosclerosis.
After surgery, we discover that the patient has DVT due to pain and oedema. Based on the patient's medical history and physical symptoms, the clinical diagnosis of deep vein thrombosis of the lower limbs screening tests for deep vein thrombosis. The patient was shown to have a strong negative predictive value for the screening test, which can be utilized as a rule-out test to lessen the requirement for imaging.

The necessity for an urgent screening test that can be carried out is paramount. Centred on the use of plethysmography and D- While there are some exercises you may do on your own to reduce your chance of developing DVT, consulting a physiotherapist for DVT treatment and prevention is the recommended plan of action if you are prone to the condition.

Physical therapists have extensive knowledge of the anatomy and the responses of the body to various stimuli. Being active is the first step in treating DVT. If you can, you must go for regular walks. Spend a few minutes standing up, walking down the hall, and then coming back if you work at a desk.

2: Screening investigations for deep vein thrombosis

D-dimer tests-Laboratory tests: Enzyme linked immunosorbent assay (ELISA) Latex agglutination.

- Near patient tests: Simpli RED (agglutination test) Simplify (immune chromatography test)
- Plethysmography-Digital photo plethysmography
- Strain gauge plethysmography
- Impedance plethysmography

D dimer evaluations Plasma D-dimers are

Particular cross-linked derivatives of fibrin that are formed when fibrin is destroyed by plasmin, and their quantities are higher in individuals with venous thromboembolism.

High D- dimer concentrations, while sensitive for venous thromboembolism, aren't adequately specific for a positive diagnosis because they frequently occur in other situations such cancer pregnancy and post-operative recovery. However, when combined with clinical probability and plethysmographs,

D-dimer tests typically show a high negative predictive value and are helpful rule-out tests that decrease the necessity for imaging. (3,4,5,6)

Plethysmography

Plethysmography is the word used to describe the recording of change in limb size brought on by tissue fluid or blood that has accumulated in the vein. This measurement can be undertaken in various ways: photo plethysmography, strain gauge, and electrical impedance.

Digital photo plethysmography –

Photo plethysmography depends on the absorption of light by haemoglobin in the red cell. Digital photo plethysmography is assisted by a microprocessor, and the test is easy to perform. (7) A digital measurement probe is placed on the skin, 10 cm above the medial malleolus of the affected leg 1). The patient then rests for 45 seconds after doing 10 dorsiflex of the foot in accordance with standard technique. Based on the characteristics of the reflected light the venous refilling time is calculated and presented as a printed graph (fig 2) in one study of 180 hospital inpatients a venous refilling time of longer than 20 seconds excluded a deep vein thrombosis and had a sensitivity of 100% and a specificity of 47%.(7) Digital photo plethysmography is a simple screening test to perform, but bigger studies are needed to evaluate its usefulness fully.

Computerised strain gauge plethysmography-

The principle behind computerised strain gauge plethysmography is to measure changes in calf dimensions while venous outflow is occluded by inflation of a thigh cuff. (8) The rate of decrease in calf size when this occlusion is removed gives a measure of venous outflow. The norm in healthy venous systems is rapid emptying. With thrombotic blockages of proximal vessels, outflow is obstructed. The stain gauge is calibrated using software, and measurements of blood flow in the leg are computed. The method can be

carried out with little training, and the test can be completed in 15 minutes. One study of 307 consecutive patients showed a sensitivity of 90% for proximal (popliteal, femoral, or iliac vein) deep vein thrombosis and 66% for distal (calf vein) deep vein thrombosis.(8)

Impedance plethysmography-

Impedance plethysmography relies on the principle that the volume of blood in the leg affects the blood's ability to conduct an electrical current, which is inversely proportional to the impedance between two electrodes placed along the calf. A cuff is inflated around the thigh to obstruct venous outflow but not arterial inflow. As blood accumulates in the leg below the cuff, impedance between the calf electrodes falls. The sudden release of the cuff results in the blood volume of the leg decreasing, resulting in a rapid increase in impedance. Obstruction to venous flow such as with a deep vein thrombosis causes a reduction in the rate of venous emptying (and slower increase in impedance) than normal. (9)

Definitive investigations for deep vein thrombosis

- Venography
- Ultrasonography: Compression ultrasound Duplex ultrasonography Colour coded Doppler ultrasonography.
- Computed tomography.
- Magnetic resonance imaging

A D-dimer test and ultrasonography are two other approaches. According to some research, patients who had a normal initial ultrasound test and a normal D-dimer concentration did not require a second ultrasound scan. (10)

These are the diagnostic approach to diagnose the Deep vein thrombosis. To prevent the deep vein thrombosis, we should start the pre and post operative physiotherapy treatment. No doubt that doctor prescribed some medicines to reduce the DVT.

TREATMENT: -

Anticoagulation is a crucial part of treatment.

Patients with DVT can mostly be managed only with oral anticoagulants, with a few significant exceptions and catheter directed thrombolysis (CDT) may be recommended in the acute.(11,12)

The following can increase your risk of developing a DVT:-

1. Air travel, especially on long-haul flights
   - sitting or lying still for long periods of time
   - surgery or hospitalization
   - pregnancy and the first few weeks after giving birth
   - overweight or obesity
   - a previous history of a blood clot in your legs, chest or arms
   - varicose veins.
   - taking the oral contraceptive pill can also increase your risk of developing a DVT.

2.Major signs and symptoms to look out for: The affected limb will likely experience discomfortedema, warmth, and redness.Leg discolouration and edoema, or swelling of the ankle and foot, arefurther symptoms.These sensations frequently spread to the foot and toe

Physiotherapy Treatment for Deep Venous Thrombosis

DVT, consulting a physiotherapist for DVT treatment and prevention is the recommended plan of action if you are prone to the condition. Physical therapists have extensive knowledge of the anatomy and the responses of the body to various stimuli. Being active is the first step in treating DVT. If you can, you must go for regular walks. Spend a few minutes standing up, walking down the hall, and then coming back if you work at a desk.

The best exercises for this condition are:

Ankle pumps:

To perform, first point your toes away from your head before pulling them back.Perform quickly and use al l of your possible range of motion.Repeat at least 10 times every hour while you are awake.This straightfor ward workout promotes blood circulation and lowers the chance of clotting

Knee motion:

Place your foot flat on the ground while seated in a chair.For two to three minutes, carefully rock your kne e from side to side while keeping your foot on the ground.The ligaments around your ankle are stretched a nd relaxed as a result.

Heelraise:-

Stand with your hands in front of you and lean on a wall, countertop, or chair back for support during the h eel raise exercise.Step apart with your feet and slowlyraise and lower yourself onto your toes.Start with ro ughly 10 of them and increase the number to 20 or more.

Straight leg raises:

This is a simple exercise that aid to build muscle and increase circulation.

Lay on your back on the floor to perform. While keeping the other leg flat on the ground, bend one knee to a 90-degree angle. Lift the straight leg six inches off the ground while taking a slow, deep breath. Lower the leg after three seconds of holding the other leg and repeat.

After the surgery to prevent the Deep vein thrombosis lower limb of the patient position is that a pillow should be placed under the limb and take a step for patient to prevent the DVT is RICE which stand for rest , icing, compression, elevation.

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