

# Is it always DVT? Evaluation of Leg Swelling with Color Doppler Sonography

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**Objective:** The aim of this study was to assess the value of duplex ultrasound examination in establishing diagnosis in swollen lower limbs. **Setting:** This study was conducted at the Department of Diagnostic radiology Mayo hospital Lahore.

**Method:** 50 consecutive patients presenting with leg swelling, submitted for colour Doppler sonography of the lower extremities were examined for deep vein thrombosis (DVT). **Results:** 46% of the patients were detected as having DVT, when examined through Doppler Ultrasonography. While 28% of the patients were not having any pathology in the limb. 26% of the patients were having pathology other than DVT. **Conclusion:** The veins of the calf muscles are a common site of acute DVT and a source of pulmonary embolism. They should always be investigated in patients with leg swelling. Complete venous evaluation with duplex imaging can be very helpful in determination of underlying cause of the swelling.

**Key words:** DVT, Pulmonary Embolism, Color Doppler

Deep venous thrombosis (DVT) is a common and severe disease which can produce a pulmonary embolism as an acute consequence and post-phlebitic syndrome as a late complication

Recently, it has been referred to as "Economy Class Syndrome" due to the occurrence after sitting on long flights. Color-Doppler and Power Doppler currently allow an accurate and early diagnosis of deep venous thrombosis (DVT). Superficial thrombophlebitis is the name for a blood clot in a vein just below the skin, such as a varicose vein. This is almost never a life threatening condition. Deep venous thrombosis is not the same as superficial thrombophlebitis. Deep veins, in which a DVT occurs, can not be seen or felt under the skin. Major surgery, particularly hip and knee replace, increases the risk of DVT due to venous injury and immobilization. This is true even in patients without any other risk factors for DVT. Persons affected are generally older.

**Method:** We examined 50 patients presenting with complaint of leg swelling. Both limbs were examined in all patients. An informed consent was obtained in all patients. All veins including superficial femoral, deep femoral, anterior tibial, posterior tibial were examined. Venous flow was examined in each vein regarding their compressibility, respiratory phasicity, and augmentation. Veins having thrombus were not compressible when pressure was applied. An increased flow was not seen when compression was applied lower down. They also didn't respond to respiratory cycle. In patients not having DVT, all these three tests were positive. Thrombus was seen more commonly in femoral veins. P opliteal vein was the 2<sup>nd</sup> more common vein. DVT was seen less commonly in anterior and posterior tibial veins.

## Results:

Diagnosis of DVT was made by means of color Doppler sonography in 23 patients. 3 patients were having incompetent venous valves.

Fourteen had no evidence of venous obstruction or incompetence at the areas evaluated. 8 patients were found having Baker's cyst and 1 was having calf haematoma) and inguinal lymphadenopathy was noted also in 1 patient.

The results were as follows:

46% patients.....DVT  
28% patients.....Normal  
16% patients.....Baker's Cyst  
6% patients.....Incompetent valves  
2% patients.....Calf Hematoma  
2% patients.....Inguinal Lymphadenopathy.

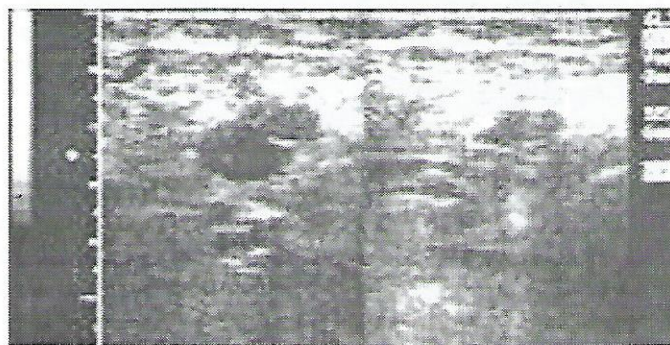


Fig 1. Gray Scale finding, no compression and echogenic thrombus

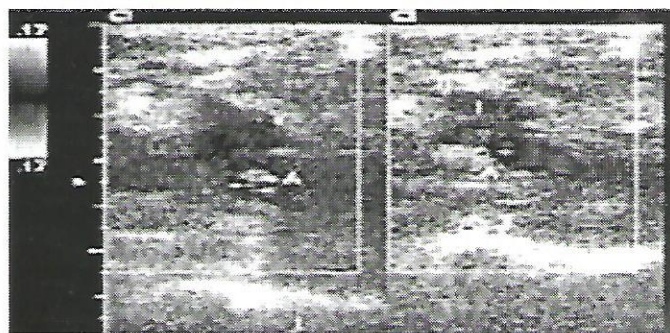


Fig. 2. Absent flow in the popliteal vein and thrombus

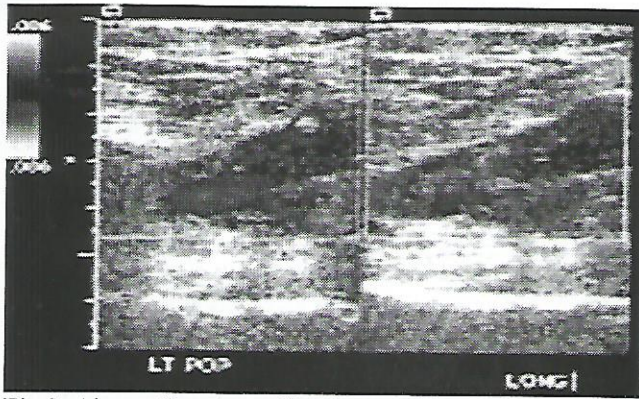


Fig 3. Absent flow in popliteal vein , DVT

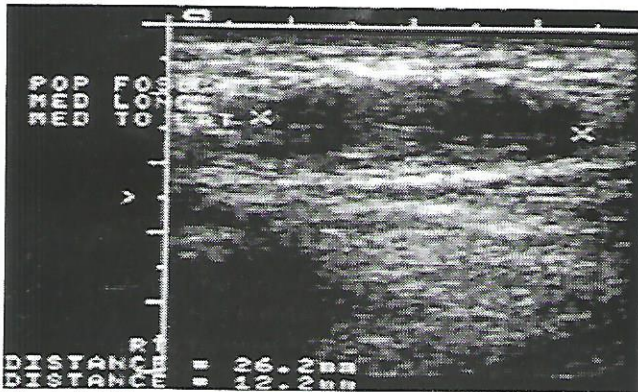


Fig 4. Calf haematoma

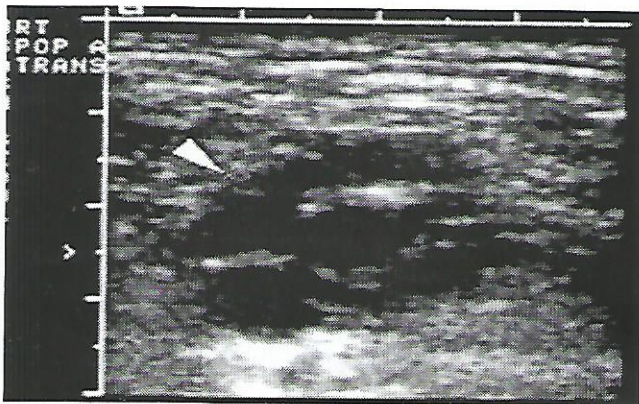


Fig 5. Baker cyst

**Discussion:**

Deep vein thrombosis can be detected through venography and radionuclide venography, Doppler ultrasonography, and impedance plethysmography. Venography is the most accurate test, but it is not used much, because it is often painful, expensive, exposes the patient to radiation, and can cause reactions.

Doppler ultrasonography is usually the preferred procedure for detecting deep vein thrombosis. This technique uses sound waves to measure blood flow through leg veins and arteries. A blood pressure cuff is wrapped around the patient's ankle and a transducer with gel on it is placed over pulse points of the foot and lower leg. High-frequency sounds bounce off the soft tissue and the echoes are converted into images on a monitor. It is very accurate in detecting clots above the knee that can become pulmonary embolisms.

**Conclusion:**

Doppler is a painless and convenient test, which is readily available and is not expensive in evaluation of patients with leg swelling and can confidently diagnose diseases.

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