

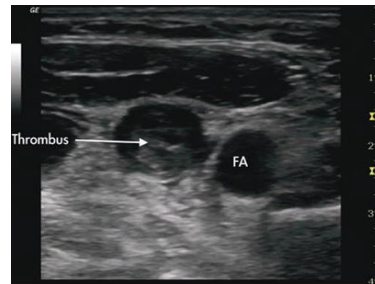
SENSITIVITY AND SPECIFICITY OF THREE-POINT COMPRESSION ULTRASONOGRAPHY TEST PERFORMED BY EMERGENCY PHYSICIANS FOR DIAGNOSIS OF LOWER LIMBS DEEP VENOUS THROMBOSIS

Assem Abd-Elrazek Abd-Rabo¹, Tamer Abdullah Helmi², Hassan Abd-Elsalam Fathi³, Asmaa Mohamed Alkafafy⁴, Eman Helmi Ahmed El-Gazzar⁴

¹DEPARTMENT OF ANAESTHESIA AND SURGICAL INTENSIVE CARE, ²DEPARTMENT OF CRITICAL CARE MEDICINE, ³DEPARTMENT OF RADIODIAGNOSIS, ⁴DEPARTMENT OF EMERGENCY MEDICINE, FACULTY OF MEDICINE UNIVERSITY OF ALEXANDRIA

INTRODUCTION:

- Deep vein thrombosis (DVT) is defined as development of thrombosis within the deep veins of the pelvis or lower limbs.
- Thrombus formation is a dynamic, multifactorial process that depends on a fine balance of physical and biochemical factors. The causes of thrombosis include three main causes: vessel wall injury, hypercoagulability, and venous stasis which is known as Virchow's triad.
- Early detection of deep venous thrombosis is very important not only to initiate anticoagulant therapy, but also very important to prevent further complications and to reduce morbidity and mortality.
- Diagnosis of DVT depends on clinical examination, laboratory and radiological investigations.
- Development of DVT is affected by many factors either genetic or acquired risk factors like age, Trauma, Cancer, Surgery, Pregnancy, Obesity, Immobility, hospitalization, hormonal therapy, inherited and acquired hypercoagulable states, anaesthesia, myocardial infarction, history of DVT, varicose veins, infections, inflammatory bowel disease, dehydration, and renal impairment are common risk factors.
- Compression ultrasonography is the first-line imaging tool for diagnosis of DVT because it is safe, easily accessible, cost-effective, and reliable. It is accurate to determine the size, chronicity, and degree of occlusion of a thrombus which is very helpful for making the decision of starting medical management or interventional techniques.



AIM OF THE WORK

- The aim of this study was to evaluate the sensitivity and specificity of the three-point compression ultrasonography test performed by emergency medicine residents at the emergency department of Alexandria Main University Hospital for early detection of lower limbs deep vein thrombosis in an expected shorter duration in comparison to the formal doppler ultrasonography by radiology residents.

SUBJECT:

- This study included 100 patients collected from (AMUH) Emergency Department, according to a sample size calculation done at the "Community Medicine Department, Faculty of Medicine, Alexandria University".

Inclusion criteria:

- Age > 18 years.
- Any patient complaining of acute unilateral or bilateral limb swelling.
- Suspected DVT according to Well's score for diagnosis of DVT.

Exclusion criteria

- Long bone fracture at the affected limb.
- Chronic lower limb swelling.
- Patients with chronic peripheral vascular diseases.
- Patients who have an inserted femoral catheter.
- Morbid obesity (body mass index 40 or more).
- Sever lower limb pain, agitation.

METHODS:

Study Design: prospective cross-sectional study.

1. Data Collection: Complete history taking; age, sex, medical, drug.. etc.

2. General physical examination: according to the ABCDE approach,

- Airway; maintain a patent, clear and secure airway.
- Breathing; maintain breathing, oxygenation and respiratory rate.
- Circulation; blood pressure, mean arterial pressure, heart rate.
- Disability; Glasgow coma scale, random blood sugar and pupils assessment.
- Exposure and general examination (head to toe examination).

3. Local examination of the suspected limb and Wells score (signs of DVT):

- Unilateral or bilateral lower limb edema.
- Hotness at the affected side.
- Tender calf muscles.
- Motor sensory functions.
- Presence or absence of skin changes; ulcers or discoloration.

4. Laboratory investigations:

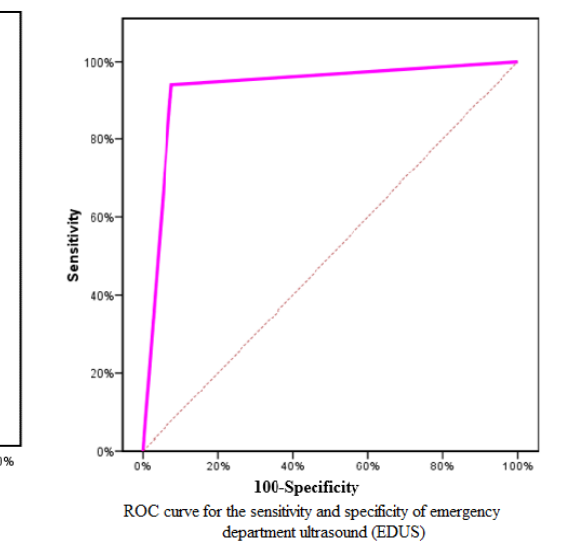
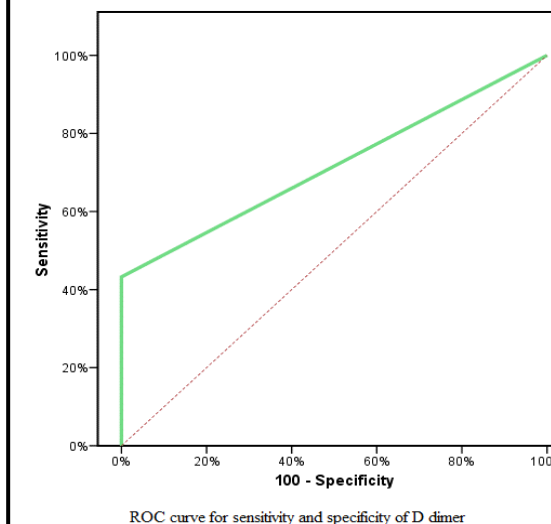
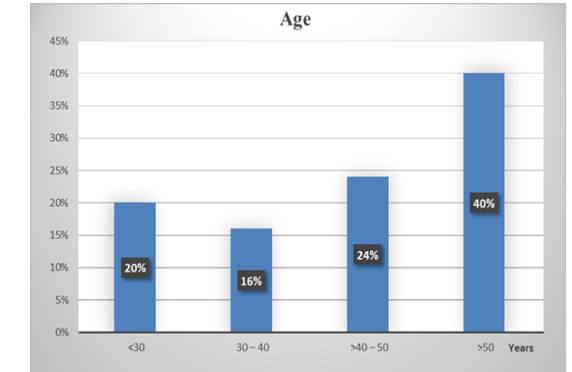
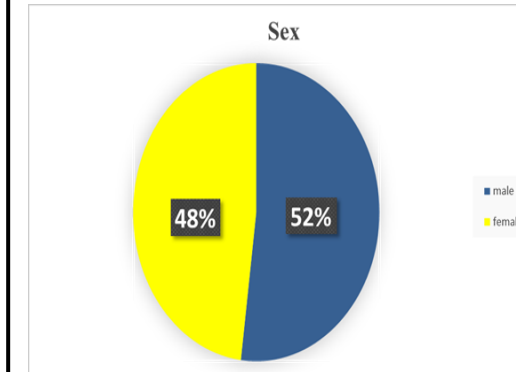
- Complete blood picture, prothrombin time, International normalized ratio, Serum creatinine, D-Dimer.

5. Emergency department three-point compression test:

- Ultrasound examination of 3 sites: common femoral vein, sapheno-femoral junction, popliteal vein.
- Methods to distinguish the artery from the vein: The artery is minimally compressible while the vein is fully compressible, it is larger than the artery, and will demonstrate respiratory collapse.

6. Formal radiological ultrasound examination.

RESULTS:



CONCLUSION:

- The emergency department ultrasound can be conducted after shorter duration of admission (38.80 minutes after triage), which saves time and allow early diagnosis and management. Emergency department ultrasound is highly sensitive (94.12%), highly specific (92.42 %) and very accurate (93.0 %) diagnostic tool. No statistically significant difference between the results of ultrasound done by emergency physician and that done by radiology resident.