

**Case Report****EXTENSIVE DEEP VEIN THROMBOSIS WITH SILENT PULMONARY EMBOLISM DURING PUERPERIUM****Muhammad IH<sup>1\*</sup>, Ibrahim A<sup>1</sup>, Bura AI<sup>1</sup>, Abdulmumini H<sup>1</sup>, Abba U<sup>2</sup>**<sup>1</sup>Department of Radiology Yobe state University Teaching Hospital, Damaturu-Nigeria<sup>2</sup>Department of Obstetrics and Gynaecology, Yobe state Specialist Hospital Damaturu-Nigeria**\*Correspondence:** Isa Hassan Muhammad; Muhdisah206@gmail.com**Abstract**

**Background:** Deep vein thrombosis (DVT) is a condition characterised by one or more blood clots forming in a deep vein, commonly in the leg or pelvis. DVT is a serious complication during pregnancy and puerperium but often remains undiagnosed. Significant percentage of patients with DVT may have concomitant silent pulmonary embolism (PE).

**Case presentation:** We are reporting a case of extensive DVT involving the iliac veins with silent PE during puerperium, in a 40-year-old grand multiparous woman following Caesarean section in a referral teaching hospital of northeastern Nigeria. Patient had unilateral leg oedema, lower limb and pelvic pain. No clinical features suggestive of PE was detected. A diagnosis of DVT with silent PE was made by Doppler ultrasound of the lower limb and pelvis and high D-dimer level. Treatment was commenced immediately with lower molecular weight heparin (LMWH) and compression stockings, to which initial positive clinical response to anticoagulation therapy was noticed while on admission before the patient was referred to another tertiary hospital on request. As a result of this, follow up Doppler scan was not done to evaluate for radiologic response to the ongoing management.

**Conclusion:** DVT is one of the recognized causes of maternal deaths, occurring as a serious complication of pregnancy and puerperium or following Caesarean section. Significant percentage of patients with DVT may have concomitant silent PE. Puerperium is the time of highest relative risk of venous thromboembolism, approximately 20-fold. Although PE may not occur nor be clinically obvious despite extensive DVT, a high index of suspicion of silent PE among obstetricians is necessary in the presence of any risk factor and early radiodiagnostic work up for DVT and PE is required for prompt treatment. This is essential in reducing maternal morbidity and mortality.

**Keywords:** Deep Venous Thrombosis, Puerperium, Caesarean section, Silent pulmonary embolism.

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**INTRODUCTION**

Deep vein thrombosis (DVT) is a condition characterised by one or more blood clots forming in a deep vein, commonly in the leg or pelvis.<sup>1</sup> It originates in the venous system of the lower extremity, starting at the calf veins and progress proximally to involve the popliteal, femoral, or iliac system.<sup>2</sup> The clots may migrate to the lungs, causing pulmonary embolism (PE).<sup>1</sup> Three aetiological factors are involved in thrombosis: vascular endothelial damage, stasis of blood flow and hypercoagulability.<sup>2</sup>

DVT is a serious complication during pregnancy and puerperium but often remains undiagnosed. Its incidence is about 1 per 1000 deliveries, of which 1-2% are fatal.<sup>3</sup> In addition to the mortality and immediate morbidity, there is also long term morbidity associated with the post-thrombotic syndrome (PTS). The majority of women, who suffer from DVT during pregnancy, develop sequelae that range from edema and skin changes to recurrent thrombosis and ulceration.<sup>4</sup>

Puerperium itself is a risk factor for DVT. Other risk factors for DVT during pregnancy and puerperium are congenital and acquired thrombophilias, varicose veins,

Caesarean section, prolonged immobility, obesity and smoking.<sup>5</sup> In approximately 50% of patients with a hereditary thrombophilia, the initial thrombotic event occurs in the presence of an additional risk factor such as pregnancy, oral contraceptive use, orthopedic trauma, immobilization, or surgery.<sup>3</sup> About 40-50% of patients with DVT may have concomitant silent PE.<sup>6</sup> Venous thromboembolism (VTE) can occur at any stage of pregnancy but the puerperium is the time of highest risk, with estimates of relative risk of approximately 20-fold.<sup>7</sup> Here, we report a case of extensive DVT in a high risk patient during early puerperium without clinical evidence of pulmonary thromboembolism.

### CASE REPORT

A 40-year-old grand multiparous woman referred to radiology department of the Yobe State university teaching hospital (YSUTH) for vascular scan on account of pelvic pain and left lower limb swelling, redness and pain of three weeks duration. Patient has had emergency caesarian section at a peripheral hospital performed five weeks prior to presentation on account of placenta praevia. Patient received three pints of blood while on admission and was discharged home one week after the surgery. On the second week of operation, patient developed the above-mentioned clinical symptoms. Pregnancy was adversely uneventful. No maternal exposure to radiation, toxic substances or unprescribed drugs during pregnancy. She had no personal or family

history of thromboembolism. No history of chronic illnesses such as hypertension or diabetes mellitus (DM) in the mother. Physical examination revealed a swollen left lower limb with tenderness and pitting oedema. Homan's sign (pain on passive dorsiflexion of the foot) was also positive. The clinician suspected DVT. Ultrasound examination of the left lower limb and abdomen was performed in both grey scale and Duplex Doppler modes. They showed thrombosis of the left common iliac vein, external iliac vein, femoral vein, popliteal vein, and tibial veins. The findings were immediately communicated to the managing specialist for prompt management action. Patient informed consent was obtained and the case was followed up. Laboratory investigations showed the following findings: hemoglobin - 10g%, platelet count - 140,000/uL; prothrombin time - 24 seconds (13-18); partial thromboplastin time - 55seconds (37-52); D-dimer - 3376 ug/L FEU (fibrinogen-equivalent unit) (0-500). The gynaecologist commenced her on low molecular weight heparin (LMWH) (Enoxaparin 1 mg/kg body weight twice daily) and application of compression stocking. Initial positive clinical response to anticoagulation therapy patient was noticed while on admission for nine days, however patient requested for a referral to University of Maiduguri teaching hospital but the reason was not disclosed. Therefore, we lost the opportunity to re-scan the patient again to evaluate her for radiological improvement.



**Figure 1: Showing swollen left lower limb**

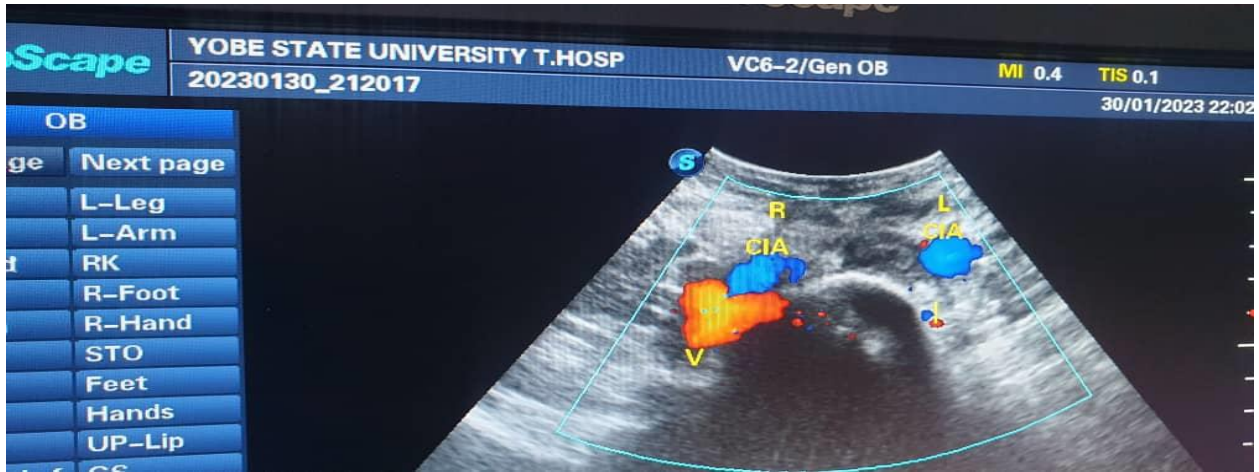


Figure 2: Transabdominal colour Doppler sonogram in transverse section showing filling defect in the left common iliac vein due to thrombus.

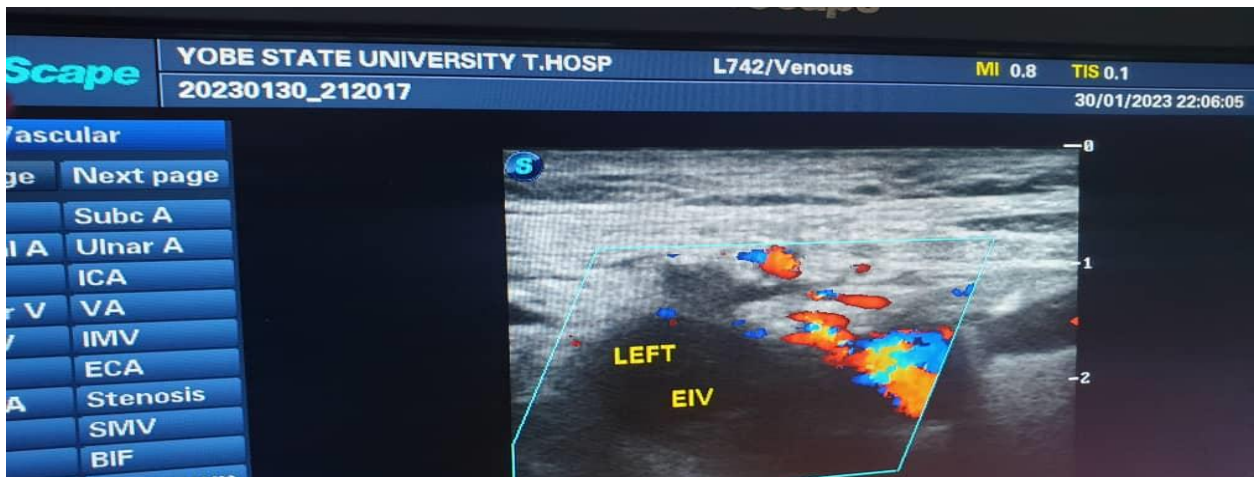


Figure 3: High resolution sonogram through the pelvis with colour Doppler in transverse section showing filling defect in the left external iliac vein due to thrombus.

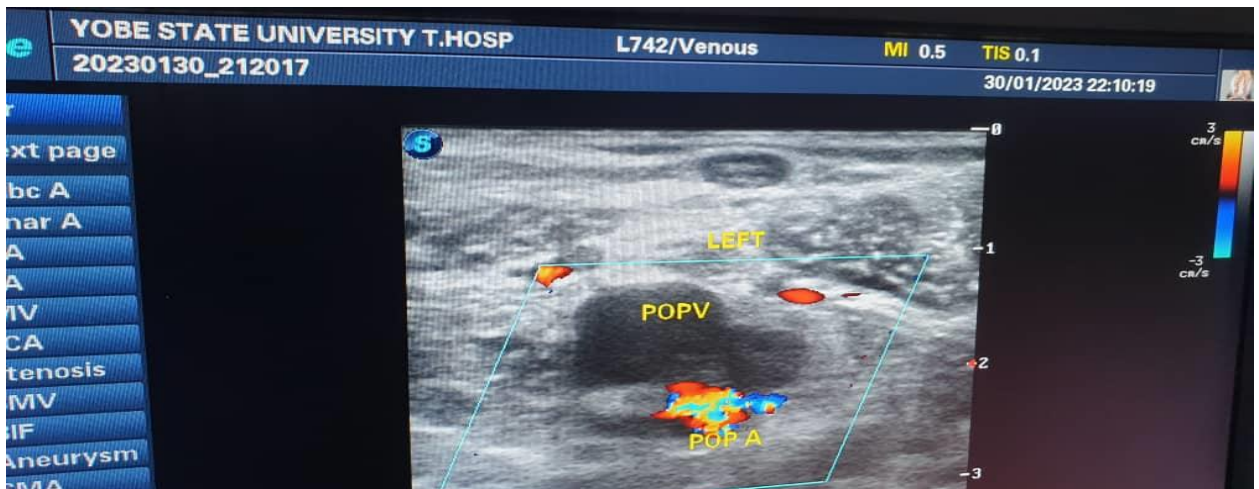


Figure 2: High resolution sonogram of the thigh with colour Doppler in transverse section showing filling defect in the left popliteal vein due to thrombus.

## DISCUSSION

DVT is one of the important causes of maternal deaths.<sup>8</sup> Pregnancy is classically thought to be a hypercoagulable state. Fibrin generation is increased, fibrinolytic activity is decreased, levels of coagulation factors II, VII, VIII, and X are all increased, free protein S levels are decreased, and acquired resistance to activated protein C is common.<sup>9</sup> During the third trimester and during the first 2 weeks following delivery, women have a relatively high risk of VTE, which is the leading cause of maternal death in Western countries.<sup>10</sup> The most important risk factors are multiparity, puerperium, post-operative periods, infections, neoplasm, systemic lupus erythematosus and hypercoagulability states.<sup>11</sup> In our case Caesarean section was one of the major risk factors involved. Also, reduction in venous flow velocity of approximately 50% occurs in the legs by third trimester and lasts until approximately 6 weeks after delivery, at which time it returns to normal nonpregnancy flow-velocity rates.<sup>12</sup> There is a striking predisposition for deep-vein thrombosis to occur in the left leg (approximately 70 to 90% of cases), possibly because of exacerbation of the compressive effects on the left iliac vein due to its being crossed by the right iliac artery.<sup>13</sup> Another probable explanation is that the left venous system follows a more tortuous course leading to increased incidence of left iliofemoral DVT. The approach to making a diagnosis currently involves an algorithm combining pretest probability, D-dimer testing, and compression ultrasonography. This will guide further investigations if necessary.<sup>1</sup> In our patient diagnosis was made by Doppler USG of the left lower limb and pelvis and a high D-dimer level. A study showed that by 4-6 weeks postpartum, D-dimer had returned to non-pregnant normal levels in 70 % of women. There was a high variability in D-dimer levels in the early postpartum period; level ranged between 550-5700 ng/ml. In later postpartum period D-dimer level had decreased between 100- 900 ng/ml. D-dimers levels were significantly elevated among women who had caesarean section when compared to women who had normal vaginal delivery (2500 ng/ml -1350 ng/ml).<sup>14</sup> In a study, a D-dimer value > 500 ng/ml was considered abnormal.<sup>15</sup> Patients with extensive DVT usually presents with PE. Fiengo et al reported a case of a 33-year-old woman with extensive DVT and PE.<sup>16</sup> Similarly, Nartey et al reported similar case in patient with bleeding uterine fibroid.<sup>17</sup> In

another different case, a 24-year-old lady presented with PE from extensive DVT following prolonged sitting of approximately 80 hours of continuous game play.<sup>18</sup> Despite having extensive DVT, our patient has no clinical features of PE. Studies have found that increased age, D-dimer level, proximal DVT, right side DVT, and unprovoked DVT, were associated with a higher incidence of silent PE.<sup>19</sup> Currently anticoagulants specifically targeting components of the common pathway have been recommended for prophylaxis. These include fondaparinux, a selective indirect factor Xa inhibitor and the new oral selective direct thrombin inhibitors (dabigatran) and selective factor Xa inhibitors (rivaroxaban and apixaban). Others are currently undergoing trials. Thrombolytics and vena caval filters are very rarely indicated in special circumstances.<sup>1</sup> Following confirmation of diagnosis of DVT, our patient was immediately commenced on subcutaneous LMWH and compression stockings to which initial clinical response noted. Follow up scan however was not done because patient was transferred to another tertiary hospital on request.

## Conclusion

DVT is one of the important causes of maternal deaths. It is a serious complication of pregnancy and puerperium not only in the western world but also in Africa. DVT can occur following Caesarean section without any additional risk factor. Significant percentage of patients with DVT may have concomitant silent PE. Puerperium is the time of highest relative risk of venous thromboembolism, approximately 20-fold. Although PE may not occur nor be clinically obvious despite extensive DVT, a high index of suspicion of silent PE among obstetricians is necessary in the presence of any risk factor and early radiodiagnostic work up for DVT and PE is required for prompt treatment. This is essential in reducing maternal morbidity and mortality.

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