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Case Report

# Sub-segmental pulmonary thromboembolism in a pregnant woman with generalized lupus erythematosus, triple-negative antiphospholipid syndrome, and protein C deficiency. A case report☆,☆☆

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ABSTRACT

Autoimmune diseases and thrombophilic disorders, notably antiphospholipid syndrome (APS) and protein S deficiency, present a formidable challenge in pregnancy, substantially increasing the risk of thromboembolic complications by up to 20%. Pulmonary thromboembolism (PTE), characterized by a significantly higher maternal mortality rate, is of particular concern.

APS, defined by the presence of antiphospholipid antibodies, emerges as a pivotal risk factor for PTE during pregnancy, especially in women exhibiting triple negativity. Concurrently, protein S deficiency further amplifies vulnerability to thromboembolic events, establishing a high-risk scenario for pregnant individuals.

In a case involving a 29-year-old pregnant woman with a history of generalized lupus erythematosus, triple-negative antiphospholipid syndrome, and protein S deficiency, sudden-onset dyspnea prompted thorough investigation. Despite her complex medical history, a multidisciplinary approach led to the accurate diagnosis and successful management of

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subsegmental pulmonary thromboembolism, ensuring the well-being of both mother and fetus.

Effectively managing PTE during pregnancy demands a comprehensive, multidisciplinary approach involving collaboration among obstetricians, internists, rheumatologists, and hematologists. Accurate diagnosis, tailored anticoagulation strategies, and continuous monitoring stand as indispensable pillars for maternal and fetal well-being.



## Introduction

Autoimmune diseases and thrombophilic disorders, notably antiphospholipid syndrome (APS) and protein S deficiency, present a significant challenge in pregnancy, substantially increasing the risk of thromboembolic complications by up to 20% [1,2]. Of particular concern among these complications is pulmonary thromboembolism (PTE), characterized by a notably higher maternal mortality rate compared to the general population [3]. APS, defined by the presence of antiphospholipid antibodies, emerges as a pivotal risk factor for PTE during pregnancy, particularly in women exhibiting triple negativity, denoting the absence of anticardiolipin antibodies, anti-$\beta$2-glycoprotein I antibodies, and lupus anticoagulant [4]. Concurrently, protein S deficiency, an intrinsic anticoagulant protein, further amplifies the vulnerability to thromboembolic events, thereby establishing a high-risk scenario for pregnant individuals.

Effectively managing PTE during pregnancy necessitates a comprehensive and multidisciplinary approach, mandating collaboration among obstetricians, internists, rheumatologists, and hematologists. The intricate nature of this process underscores the indispensability of accurate diagnosis, tailored anticoagulation strategies, and continuous monitoring. These fundamental pillars are essential not only for the maternal well-being but also to ensure the optimal health of the developing fetus.

## Case report

A 29-year-old female, gravida 2, para 1, with a history of generalized lupus erythematosus, triple-negative antiphospholipid syndrome (previously treated with Warfarin for deep vein thrombosis of the popliteal vein, and currently on enoxaparin at 1 mg/kg daily), and protein S deficiency, presented to the emergency department with sudden-onset dyspnea lasting for 3 days. The dyspnea, triggered by moderate exertion without positional changes, was accompanied by nonproductive cough.

Upon physical examination, the patient displayed a heart rate of 102 bpm, respiratory rate of 26 rpm, blood pressure of 110/70 mmHg, oxygen saturation of 98%, and was afebrile. Pulmonary examination revealed no abnormalities, but fetal viability was confirmed. The electrocardiogram showed only sinus tachycardia (see Fig. 1), and chest X-ray revealed right parahilar enlargement (see Fig. 2).

Laboratory results, including complete blood count, blood chemistry, and coagulogram, were within normal parameters. Procalcitonin and PCR were negative. Arterial blood gas analysis revealed compensated respiratory alkalosis.

The patient underwent various diagnostic studies, including obstetric ultrasound confirming adequate fetal viability and Doppler ultrasound of the lower extremity ruling out thrombosis. Risk assessment scales (YEARS, Wells, Geneva) indicated intermediate risk. D-dimer was less than 0.5 ng/dL.

A transthoracic echocardiogram yielded normal results. Subsequently, a lung perfusion scintigraphy revealed photopenic areas with segmental distribution (wedge-shaped defect with pleural base), confirming sub-segmental pulmonary thromboembolism (see Fig. 3). The patient was managed with anticoagulation using enoxaparin 80 mg subcutaneously every 12 hours (1 mg/kg daily), in addition to aspirin 100 mg and oral hydroxychloroquine 400 mg daily.

After a 2-week hospitalization with symptom improvement, the patient was discharged for outpatient follow-up. At 27 weeks of gestation, she developed grade 1 thrombocytopenia (platelets 80,000) with minor bleeding manifestations (gingival bleeding). Deflazacort 30 mg was initiated for 7 days, followed by a gradual reduction of the weekly steroid, eventually discontinuing it at 31 weeks.

Finally, at 37 weeks, the decision was made to deliver the fetus by caesarian section for obstetric reasons due to premature placental maturation and oligohydramnios. Enoxaparin was suspended 24 hours before the cesarean section and resumed 12 hours later, with no complications for both the mother and the child.

## Discussion

Autoimmune diseases and thrombophilic disorders, such as antiphospholipid syndrome (APS) and protein S deficiency, present a formidable challenge in pregnancy management, elevating the risk of thromboembolic complications by up to 20% [2]. Among these complications, pulmonary thromboembolism (PTE) stands out as one of the most severe, with a considerably higher maternal mortality rate compared to the general population [3]. APS, characterized by the presence of antiphospholipid antibodies, emerges as a prominent risk factor for PTE during pregnancy, especially in women with triple negativity (absence of anticardiolipin antibodies, anti-$\beta$2-glycoprotein I antibodies, and lupus anticoagulant) [4]. Concurrently, protein S deficiency, a natural anticoagulant

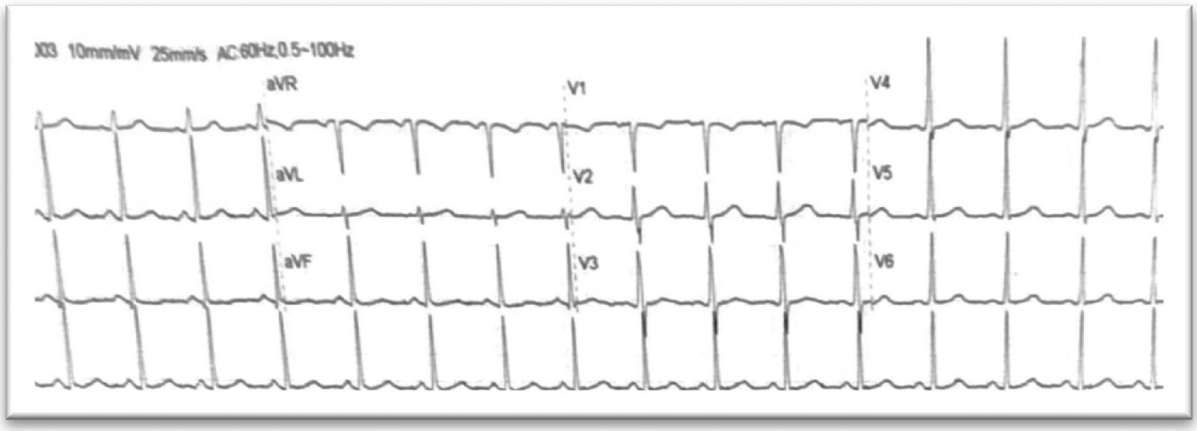


**Fig. 1 – 12-lead Electrocardiogram showing Sinus Tachycardia.**

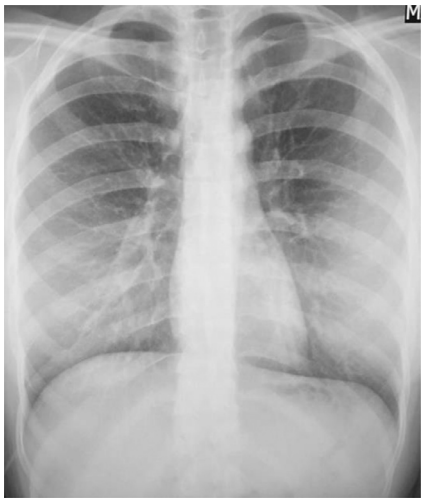

**Fig. 2 – Posteroanterior chest X-ray illustrates right parahilar enlargement.**

protein, increases susceptibility to thromboembolic events, consolidating a high-risk scenario for the pregnant patient [5].

The intricate case involves a 29-year-old pregnant woman with generalized lupus erythematosus, triple-negative APS, and protein C deficiency. The sudden onset of dyspnea in the second trimester raised concerns, leading to a meticulous diagnostic journey that unveiled subsegmental pulmonary thromboembolism [6].

Multifaceted diagnostic studies played a crucial role in unraveling the complexities of this case. From obstetric ultrasound confirming fetal viability to Doppler imaging ruling out thrombosis and lung perfusion scintigraphy pinpointing subsegmental pulmonary thromboembolism, each modality contributed to a comprehensive understanding of the patient's condition [6].

Given that pulmonary embolism (PE) stands as a leading cause of maternal mortality, prompt diagnosis through imaging becomes paramount. The literature substantiates the diagnostic equivalence of computed tomographic pulmonary angiography (CTPA) and lung scintigraphy in identifying PE in pregnant women [7]. Consequently, maternal-fetal radiation exposure should constitute a pivotal consideration in diagnostic testing. Guidelines endorse the use of ventilation/perfusion (V/Q) scans in the pregnant population with normal chest X-rays, acknowledging the maternal radiation dose associated with CTPA [8].

The challenges posed by the coexistence of autoimmune disorders and thrombophilic conditions required a tailored treatment plan. Anticoagulation with enoxaparin, along with aspirin and hydroxychloroquine, emerged as cornerstones in mitigating the intricate risks associated with the patient's medical history and current condition [9].

Further complicating the scenario, the patient developed thrombocytopenia and minor bleeding manifestations at 27 weeks. This added layer of complexity led to the introduction of deflazacort, and a carefully managed tapering of steroids ensued [6]. The decision to terminate the pregnancy at 37 weeks due to obstetric reasons emphasizes the delicate balance required in managing such intricate cases.

This case discussion significantly contributes to the ongoing dialogue on the intersection of autoimmune diseases, thrombophilic disorders, and pregnancy-related complications [10]. It underscores the importance of a collaborative approach involving specialists from internal medicine, rheumatology, and nuclear medicine, emphasizing the necessity for a holistic understanding of the intricate medical landscape presented by these coexisting conditions [11].

The successful management of this challenging case offers valuable insights for clinicians, emphasizing the imperative for ongoing research, shared experiences, and a patient-centered approach [10]. As the medical community continues to refine its understanding of these complexities, this case stands as a noteworthy contribution to the evolving knowledge base, ultimately informing improved strategies for diagnosis and management in this specialized area of healthcare [11].

In conclusion, subsegmental pulmonary embolism in pregnant women with hypercoagulable states is a serious condition. The optimal management of these patients requires a multidisciplinary approach.

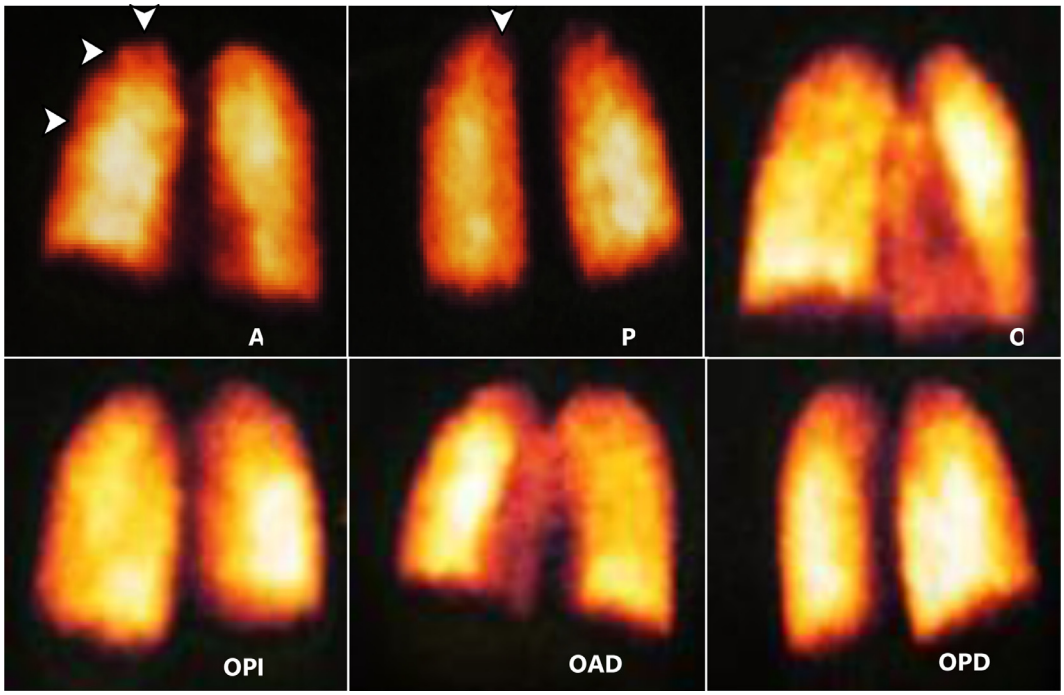


**Fig. 3 – Lung Perfusion Scintigraphy - Photopenic areas with segmental distribution, wedge-shaped defect with pleural base, seen in both anterior and posterior projections. OPI: left posterior oblique projection, OAD: right anterior oblique projection, OPD: right posterior oblique projection.**

## Contributors

Arlin Montoya Rodríguez contributed to conception of the case report and undertaking the literature review. Mario Mayorga Duarte contributed to patient care, acquiring and interpreting the data, and drafting the manuscript. Sayonara Sandino López contributed to patient care and acquiring and interpreting the data. Víctor Rosales Obregón contributed to patient care, acquiring and interpreting the data, and drafting the manuscript, Mario Enmanuel Lopez Marenco contributed to conception of the case report and undertaking the literature review. All authors approved the final submitted manuscript.

## Patient consent

Written informed consent was obtained from the patient for publication of this case report.

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