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FALSE-POSITIVE HIV SCREENING IN NEW-ONSET SYSTEMIC LUPUS ERYTHEMATOSUS PRESENTING WITH POLYSEROSITIS AND LUPUS NEPHRITIS

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ABSTRACT

False-reactive human immunodeficiency virus (HIV) screening can occur in systemic lupus erythematosus (SLE) and may delay recognition of the underlying autoimmune disease.

A 23-year-old woman presented with weight loss, polyserositis and nephrotic-range proteinuria. Her HIV antigen/antibody screen was reactive, but supplemental testing did not confirm HIV infection. Lupus serologies, hypocomplementemia and kidney biopsy established SLE with mixed proliferative and membranous lupus nephritis. Recurrent pleural and progressive pericardial effusions required immunosuppression, pericardial drainage, a surgical window and pleural decortication.

The reactive HIV screen initially favoured an infectious diagnosis; however, proteinuria, haematuria and low complement levels suggested immune-complex disease. This illustrates the risk of diagnostic anchoring on a preliminary screening result. A reactive HIV screen is not diagnostic. Prompt supplemental testing and parallel evaluation for autoimmune disease can prevent delayed diagnosis of SLE.

KEYWORDS

Systemic lupus erythematosus, lupus nephritis, pericardial effusion, pleural effusion, human immunodeficiency virus

LEARNING POINTS

- A reactive HIV screening assay is preliminary, not diagnostic; in patients with autoimmune features, prompt supplemental testing is essential because systemic lupus erythematosus can cause false reactivity.
- A reactive HIV screen may create diagnostic anchoring when weight loss, serosal effusions and renal abnormalities coexist; discordant clinical and laboratory findings should trigger reassessment rather than premature attribution to HIV.
- In a young patient with unexplained polyserositis, proteinuria and glomerular haematuria, early lupus serology, complement testing and careful family history can expedite the diagnosis of severe lupus nephritis.

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INTRODUCTION

False-reactive human immunodeficiency virus (HIV) screening results are an uncommon but recognised diagnostic problem in systemic lupus erythematosus (SLE). Earlier reports described positive enzyme immunoassays or indeterminate immunoblots in patients with lupus, and false reactivity has also been reported with modern fourth-generation antigen/antibody assays[1,2]. Cross-reacting autoantibodies and non-specific polyclonal B-cell activation have been proposed as mechanisms, although the precise cause cannot always be established.

This distinction matters because a reactive screening assay is not equivalent to a diagnosis of HIV. The recommended laboratory algorithm requires supplemental HIV-1/HIV-2 antibody differentiation testing and, when the initial assay is reactive but the differentiation assay is nonreactive or indeterminate, HIV-1 nucleic acid testing[3]. Failure to preserve that distinction can produce diagnostic anchoring, unnecessary distress and delay in identifying another multisystem disease.

We report on a young woman with new-onset SLE whose presentation included weight loss, polyserositis and renal disease. A reactive HIV screen initially strengthened concern for infection, but supplemental testing did not confirm HIV infection. Severe lupus nephritis and progressive lupus serositis ultimately explained the presentation. Although large pleural or pericardial effusions and tamponade are uncommon initial manifestations of SLE[4-6], the false-reactive HIV screen was the central diagnostic trap in this case.

CASE DESCRIPTION

A 23-year-old African American woman with no known medical history presented with generalised swelling, productive cough, pleuritic right anterior chest pain and an unintentional weight loss of approximately 20 pounds over three months. Five weeks earlier, she had experienced a brief viral-like illness followed by a persistent cough. She was afebrile, normotensive and oxygenating well on room air. Examination showed mild facial oedema, diminished breath sounds at the left lung base and bilateral 1+ pitting lower-extremity oedema.

Laboratory testing showed haemoglobin 10.1 g/dl, serum albumin 3.2 g/dl and NT-proBNP 520 pg/ml. Urinalysis demonstrated 4+ protein, more than 100 white blood cells and 21–50 red blood cells per high-power field, with numerous hyaline casts. The urine protein-to-creatinine ratio was 3.8, and the urine microalbumin-to-creatinine ratio was 2,216.1 mcg/mg. Chest radiography demonstrated a large left pleural effusion *(Fig. 1)*.

The CT pulmonary angiography excluded pulmonary embolism but confirmed a large left pleural effusion with compressive atelectasis and a pericardial effusion *(Fig. 2)*.

Computed tomography of the abdomen and pelvis showed mild ascites with peritoneal thickening and enhancement. Bilateral lower-extremity Doppler ultrasonography



Figure 1. *Chest X-ray showing large left pleural effusion.*



Figure 2. *Computed tomography angiogram showing large left-sided pleural effusion.*

showed no deep-vein thrombosis. The initial differential diagnosis included tuberculosis, HIV-associated disease, parapneumonic effusion, malignancy, primary nephrotic syndrome and autoimmune serositis. Diagnostic concern shifted towards infection after the HIV antigen/antibody screening assay was reactive. Infectious Diseases was consulted, tuberculosis testing was initiated, and airborne isolation was instituted. Supplemental HIV testing subsequently failed to confirm infection. Thoracentesis removed 1.2 L of yellow serous fluid, which was exudative and monocyte-predominant. Gram stain and cytology, and QuantiFERON-TB Gold testing were negative.

The renal abnormalities and serosal disease prompted parallel autoimmune evaluation. Antinuclear antibodies were positive in a speckled pattern at a titre greater than 1:640; anti-double-stranded DNA antibodies and extractable nuclear antigens, including ribonucleoprotein, were strongly positive. Complement levels were markedly reduced (C3 40 mg/dl and C4 3.5 mg/dl). MPO, PR3,

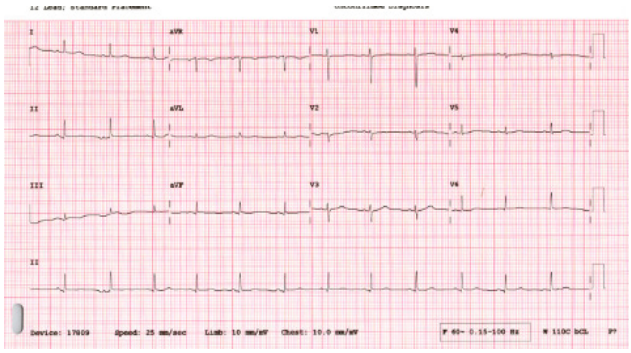


Figure 3. *Electrocardiogram showing low amplitude QRS complex.*

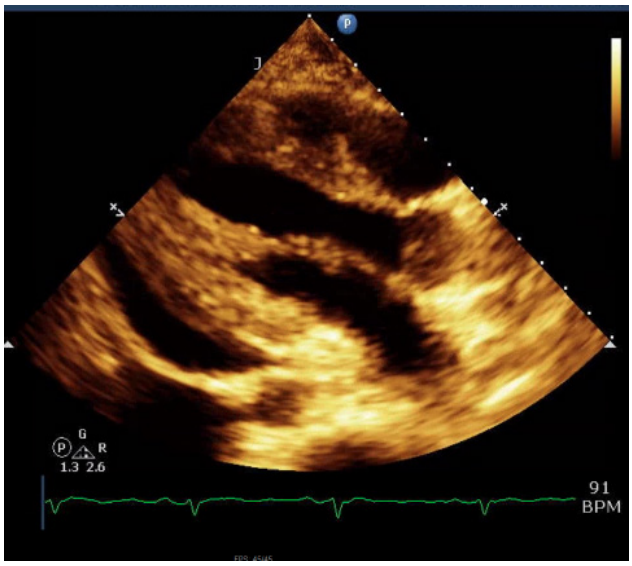


Figure 4. *Transthoracic echocardiogram showing pericardial effusion.*

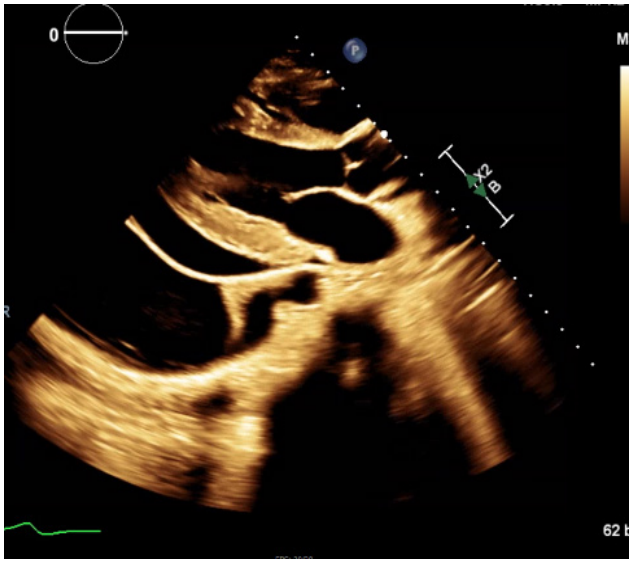


Figure 5. *Repeat transthoracic echocardiogram showing worsening pericardial and pleural effusion despite drainage of pleural effusion.*

hepatitis B serologies and PLA2R antibody were negative, and immunofixation showed no monoclonal gammopathy. A family history obtained during hospitalisation revealed that her brother had lupus.

Electrocardiography showed a sinus rhythm with low voltage *(Fig. 3)*.

An initial transthoracic echocardiography demonstrated a moderate pericardial effusion without tamponade *(Fig. 4)*.

Colchicine was started for pleuritic, positional chest discomfort attributed to inflammatory pericarditis. A kidney biopsy established mixed proliferative and membranous lupus nephritis (class III/IV with class V). The patient received pulse intravenous methylprednisolone followed by oral prednisone, tacrolimus and mycophenolate sodium.

Despite immunosuppression, left pleural effusion recurred and required repeat thoracentesis. It later became loculated, while the pericardial effusion enlarged and developed early echocardiographic tamponade physiology *(Fig. 5)*.

After transfer for definitive management, the patient underwent pericardial drainage followed by a left video-assisted thoracoscopic pericardial window and pleural decortication. She improved with combined immunosuppressive and procedural treatment.

DISCUSSION

The principal lesson is not merely that SLE can cause severe serositis; it is that SLE can also produce a false-reactive HIV screen that redirects the diagnostic narrative. In this patient, weight loss, cough, pleural and pericardial effusions, ascites, and a reactive HIV screen formed a coherent infectious hypothesis. That hypothesis was reasonable, but it became hazardous when the screening result was interpreted before completion of the diagnostic algorithm.

Published reports show that lupus-associated serologic cross-reactivity predates current HIV assays[1], and a recent case demonstrates that false reactivity can also occur with a fourth-generation antigen/antibody screen[2]. Therefore, clinicians should document the result as reactive rather than positive until supplemental testing is complete. When the screen and supplemental tests disagree, HIV-1 nucleic acid testing is used to distinguish acute infection from a false-reactive screen[3]. In this case, supplemental testing did not confirm HIV infection; the result was therefore interpreted as false reactive in the clinical context of active SLE.

Several findings argued against allowing HIV to become the unifying diagnosis. Nephrotic-range proteinuria accompanied by microscopic haematuria suggested glomerular inflammation rather than isolated hypalbuminaemia. Marked hypocomplementemia, high-titre antinuclear antibodies and anti-double-stranded DNA positivity strongly supported immune-complex disease. The later discovery of lupus in the patient's brother further increased the pretest probability of SLE. These clues justified simultaneous autoimmune and infectious evaluation rather than a sequential approach dependent on the screening result.

The serositis also required continued reassessment.

Pericardial involvement is well recognised in SLE, but tamponade as an initial manifestation is rare[4-6]. The initially moderate effusion progressed despite haemodynamic stability at presentation, and the recurrent pleural effusion became loculated. Serial echocardiography and multidisciplinary management were therefore essential. Kidney biopsy provided the decisive tissue diagnosis and supported intensive immunosuppression, while progressive serosal complications required drainage, a pericardial window and thoracoscopic decortication.

CONCLUSION

A reactive HIV screening assay can be a diagnostic red herring in active SLE. It should prompt completion of the HIV diagnostic algorithm, not premature attribution of a multisystem illness to HIV. In young patients with polyserositis, proteinuria, glomerular haematuria or low complement levels, autoimmune evaluation should proceed in parallel. In this case, recognising the discordance between the preliminary HIV screen and the broader clinical picture enabled diagnosis of severe lupus nephritis and progressive lupus serositis before further delay.

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