Revista Română de Reumatologie
Romanian Journal of Rheumatology

CASE REPORT

Diagnostic and Therapeutic Challenge in a Case with Simultaneous Onset of Systemic Lupus Erythematosus and Severe Pulmonary Infection

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Abstract

Introduction: Systemic lupus erythematosus (SLE) is a chronic multisystem autoimmune disease with varied clinical manifestations. The concurrent onset of SLE with a severe infection is rare and represents a diagnostic and therapeutic challenge, requiring a multidisciplinary approach.

Case report: We present the case of a 50-year-old patient, known to have long-standing epilepsy and early menopause, who presented with inflammatory joint pain, diffuse alopecia, asthenia and evening fever. Investigations revealed pancytopenia, hypocomplementemia, positive ANA profile, positive direct Coombs test. Pulmonary imaging revealed multiple areas of ground-glass condensation and hydroaeric abscesses, and microbiological examination isolated Pseudomonas aeruginosa and Candida spp. The patient received complex treatment, including pulse corticosteroid therapy, broad-spectrum antibiotics, antifungals, hematological support and oxygen therapy, with careful monitoring of hematological and imaging evolution. The evolution was favorable, with regression of lung lesions and improvement of general condition. Subsequently, due to non-compliance, the patient presented relapses of SLE, being stabilized and proposed for biological therapy with anifrolumab.

Conclusions: The simultaneous onset of SLE and a severe pulmonary infection requires rapid recognition and multidisciplinary management. Careful monitoring, patient education and modern therapeutic options, including biological therapy, can prevent complications and optimize disease control.

Keywords: systemic lupus erythematosus, concurrent onset, severe pulmonary infection, anifrolumab, pancytopenia, multidisciplinary management.

Introduction

Systemic lupus erythematosus (SLE) is a chronic, multisystem autoimmune disease characterized by the production of autoantibodies and simultaneous involvement of multiple organs, including the skin, joints, hematological system or kidneys [1]. The disease occurs predominantly in young women, with a female:male ratio of approximately 9:1 and a common onset between the ages of 20 and 40 [2]. Clinical manifestations are highly variable, ranging from mild forms with skin and joint involvement to severe forms with renal, hematological, and immunological involvement, which can be life-threatening [1,3].

Infections are an important complication in SLE, frequently associated with immunosuppression induced by immunosuppressive treatments, corticosteroid therapy or cyclophosphamide therapy, but also with the intrinsic immune deficiency of the disease [4,5]. The concurrent onset of SLE with a severe infectious process is rare, but represents a major clinical challenge, as the initial symptoms may be difficult to differentiate from infectious signs and late diagnosis may lead to severe complications [6].

The management of these cases requires a multidisciplinary approach, combining rheumatological, hematological, pulmonary and infectious disease expertise. Modern biological therapy, including anifrolumab – an anti-type I interferon receptor monoclonal antibody – has demonstrated efficacy in controlling disease activity and reducing the dose of corticosteroids in patients with moderate-to-severe SLE, offering a promising therapeutic option in complicated cases [7,8].

In this report, we present a case of simultaneous onset of SLE and severe pulmonary infection in a 50-year-old female patient, highlighting the diagnostic and therapeutic challenges, as well as the importance of integrated management and strict monitoring.

Case presentation

The patient, a 50-year-old female from an urban area, known to have epilepsy since the age of 10,

initially treated with carbamazepine for approximately 30 years, interrupted for four years and replaced with levetiracetam 2000 mg/day, presented to the rheumatology outpatient clinic with inflammatory joint pain in the small joints of the hands and feet. The symptoms began approximately two years ago but were neglected by the patient during this period.

Relevant medical history included early menopause at 35 years of age and severe osteoporosis confirmed by DXA of the lumbar spine (T-score -3.1 DS). At the time of presentation, the patient complained of increasing joint pain, diffuse alopecia, marked physical asthenia and weight loss of approximately 6 kg in the last two months. At each outpatient presentation, the patient was recommended to be admitted to the Rheumatology Clinic of the Craiova County Emergency Hospital, which she repeatedly refused. Laboratory investigations performed in the outpatient clinic revealed bicytopenia (hemoglobin 9 g/dl, platelets 100,000/mm³), hypocomplementemia of the C3 fraction, abnormal immunoglobulins (increased IgA, decreased IgG) and an extended ANA Blot profile with positivity for anti-nucleosome, anti-histone, anti-AMA M2, anti-Sm and anti-dsDNA antibodies. The direct Coombs test was positive. Admission to the Rheumatology Clinic is recommended, which the patient accepts this time in the context of the marked alteration of her general condition. Upon admission in July 2024, the patient presented with an influenced general condition, afebrile, cachectic, dyspneic and SaO2 of 91%, with pale skin and mucous membranes, friable nails and hair and also reported prolonged evening fever (38.8°C) for approximately seven days prior to admission and persistent dry cough, for which she administered paracetamol at home. Pulmonary auscultation revealed diminished vesicular murmur and crepitant rales disseminated in both lung areas. The patient presented with quasi-permanent, predominantly inflammatory polyarthralgias, myalgias and marked physical asthenia. This combination of articular, hematological, cutaneous manifestations and fever suggests the simultaneous onset of SLE and an infectious process, which constituted an important and rare element, representing a diagnostic and therapeutic challenge.

Initial laboratory tests revealed marked pancytopenia (Hb 5g/dl, leukocytes 3 000/mm³, platelets 40 000mm³), hypocomplementemia of the C3 fraction (56.93 mg/dl, N=90–180 mg/dl) increased LDH (306 U/L, N=125–220) and marked inflammatory biological syndrome (Table 1). Renal function was preserved, and 24-hour proteinuria was within normal limits.

Table 1. *Evolution of the complete blood count (CBC) during hospitalization*

Period / Timepoint	Hemoglobin (g/dl)	Leukocytes (/mm³)	Platelets (/mm³)	Remarks
Initial admission (Rheumatology/ Pneumology)	5.0 – 5.8	3 000 – 7 000	40 000 – 70 000	Severe pancytopenia
After transfusional support	6.0 – 7.2	3 080 – 5 480	25 000 – 72 500	Partial stabilization
Discharge from Pneumology	8.7 – 8.8	5 000 – 6 000	~100 000	Clinical and biological improvement

Chest radiography revealed pulmonary condensation suggestive of complicated pneumonia with progression to abscess (Figure 1).

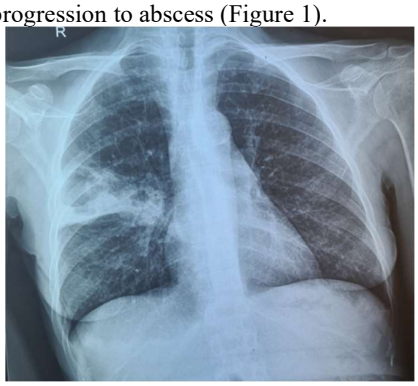
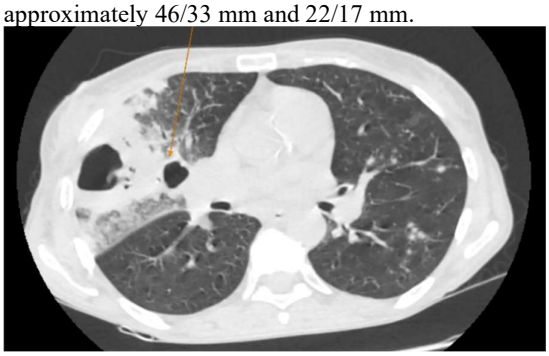


Figure 1. *Chest radiography revealed triangular opacity with dimensions of 55/81.1mm located in the ventral segment, right upper lung lobe, with diffuse upper contour, delimited by horizontal fissure with inhomogeneous structure due to the presence of transparent areas inside.*

A contrast-enhanced chest CT was performed (Figure 2), which revealed diffuse areas of reduced transparency in the right upper lobe anterior and posterior segments with a "ground glass" appearance, with a confluent character and organization in condensation areas, with an air bronchogram, tangential to the parietal pleura and to the fissures, and two hydroaeric images with dimensions of approximately 46/33 mm and 22/17 mm.



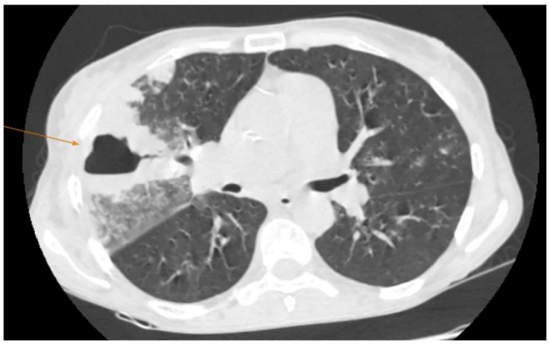


Figure 2. *Contrast-enhanced chest CT: diffuse areas of reduced transparency in the right upper lobe anterior and posterior segments with a "ground glass" appearance, with a confluent character and organization in condensation areas, with an air bronchogram, tangential to the parietal pleura and to the fissures, and two hydroaeric images with dimensions of approximately 46/33 mm and 22/17 mm (arrows).*

A pneumology consultation was requested, who recommended sputum examination for Mycobacterium tuberculosis using the GeneXpert test and sputum culture, and antibiotic therapy with moxifloxacin 400mg/250mg was initiated. The following day, the cough intensified, the patient presented with moderate hemoptysis, which required transfer to the Pneumology department. Microbiological investigations confirmed the presence of Candida spp. and Pseudomonas aeruginosa, sensitive to cephalosporins and quinolones, the GeneExpert result being negative. Antibiotic therapy with Moxifloxacin and Sulcef, as well as Metronidazole and Fluconazole, was associated, and hemostatics, nutritional supplements, PPIs and injectable corticosteroid therapy were administered (initially HHC 100 mg 1 vial/12 hours, followed by Dexamethasone 1 fl/12 hours). The patient received oxygen therapy (2–3 l/min), anti cough medication, rehydration and hydroelectrolytic rebalancing solutions, as well as isogroup and isoRh red blood cell and platelet transfusion. This stage highlighted the diagnostic challenge of the concurrent onset of SLE and severe pulmonary infection, the need for multidisciplinary management and the importance of rigorous imaging and biological monitoring to prevent complications.

Lung CT performed shortly after transfer revealed a well-demarcated mixed hydroaeric image in the middle lobe, with a drainage bronchus present, and multiple air cavities in the left upper lobe, some with a drainage bronchus, indicating an inflammatory-infectious process with progression to abscess. Repeated imaging monitoring subsequently showed dimensional and numerical regression of the cavities and lesions, demonstrating a favorable response to the combined treatment and multidisciplinary approach. (Table 2).

Table 2. *Chest CT evolution during follow-up*

Timepoint / CT scan	Findings
Initial CT (admission)	Right middle lobe: mixed hydro-aeric lesion, well-defined, wall 4 mm, overall dimensions 58 × 42 × 60 mm, with drainage bronchus; adjacent cavitary lesion 32 × 24 mm, wall 4 mm; left lung: multiple excavated nodules up to 10 mm (apico-posterior LUL); small right pleural effusion (8 mm).
CT after 7 days of antibiotics	Regression in size and number of cavitary lesions. Right superior lobe posterior segment: cavitary lesion 40 × 36 mm, with bronchial drainage, adjacent cavity 25 × 26 mm and 8.6 × 10 mm. Left lung: small cavitary lesions with thin walls, max. 6.5 × 5 mm.
Final CT before discharge	Significant regression of cavitary lesions bilaterally, no new nodules, thin-walled residual cavities, improved aeration.

During hospitalization, a progressive improvement in the general condition and a gradual stabilization of the hematological parameters were observed, with an increase in hemoglobin and platelets and a decrease in inflammatory markers. The patient was discharged with improved general condition, hemodynamically stabilized and with increasing hematological values. At the time of discharge, hemoglobin was 8.78 g/dl, leukocytes 6 000/mm³, and platelets 100 000/mm³, indicating a progressive recovery after the combined therapy with corticosteroids and transfusion support. Inflammatory markers improved, with ESR 15 mm/h and CRP 11.8 mg/l.

During this period, the patient also benefited from cardiology and gynecology consultations, which did not reveal significant pathologies, confirming the predominantly pulmonary and hematological nature of the complications. Hematological evolution was carefully monitored, with progressive increases in leukocytes and platelets after the initiation of pulse corticosteroid therapy and transfusion support.

This stage highlighted the complexity of the case: the onset of SLE concomitant with a severe pulmonary infection, the need for rapid integration of pneumological, microbiological and rheumatological assessments and the importance of prompt management to prevent severe complications, such as hemoptysis and lung abscess. She was discharged from the pneumology department of SCJU Craiova, maintaining antibiotics and antifungals for up to 28 days, according to previous regimens - cefuroxime 400 mg / day and moxifloxacin 400 mg / day as well as antifungal - fluconazole 150 mg / day, supplements and nutritional support, chronic neurological treatment: levetiracetam 1 g / day and valproic acid 500 mg / day as well as hydroxychloroquine 400mg / day. Recommendations: pneumological and

neurological reevaluation, rheumatological re-consultation to establish immunosuppressive management, and the patient was advised on strict adherence to treatment and avoidance of risk factors, especially smoking.

After 2 months, the patient voluntarily discontinued hydroxychloroquine treatment, did not attend the recommended rheumatology check-ups and continued to smoke heavily, which contributed to the exacerbation of the disease.

In April 2025, the patient was admitted to the rheumatology clinic again, with an altered general condition, BMI = 14.06, diffuse alopecia, polyarthralgias and myalgias, pale skin and mucous membranes, friable skin with moderate to severe disease activity with a SELENA-SLEDAI score of 8. Biologically, hypocomplementemia (C3 = 73.62 mg/dl), anemia (Hb = 7.12 g/dl), inflammatory syndrome (CRP = 36.8 mg/l, ESR = 120 mm/h) and elevated serum ferritin (644.9 ng/ml) are maintained. From the recent history, the administration of four vials of cyclophosphamide was mentioned during December 2024–January 2025 in the Hematology clinic, as part of the treatment for autoimmune hemolytic anemia and leukopenia and the control of disease activity. Laboratory tests indicated persistent pancytopenia, with severe leukopenia (600/mm³). Hematological reevaluation is recommended to explore the cause of leukopenia (post-cyclophosphamide immunosuppression vs. disease activity), as well as digestive endoscopic evaluation to exclude a secondary cause of anemia. Severe leukopenia required close surveillance and prophylactic treatment with antibiotics (Meropenem), hematological support and strict monitoring of HLG. Pulse therapy with methylprednisolone 1 g/day was performed for three days, the evolution being favorable, leukocytes progressively increasing to values of 1.140–1.930/mm³, and the general condition improving significantly. Upon discharge, the patient was stabilized, with resumption of hydroxychloroquine 400 mg/day, oral corticosteroid therapy 1 mg/kg/day. Given the history of severe relapses, immunosuppression and complicated infections, as well as suboptimal adherence to treatment, careful outpatient follow-up is recommended and anifrolumab therapy is considered as a therapeutic option to control disease activity and reduce the dose of corticosteroids, in accordance with the EULAR and ACR guidelines for systemic lupus erythematosus. This modern approach could contribute to the prevention of severe relapses and to maintaining a better quality of life, in the context of multidisciplinary monitoring and control of opportunistic infections. This therapeutic option represents a promising perspective for patients with severe, recurrent SLE, at high risk of infectious and hematological complications.

This stage highlighted the importance of close collaboration between rheumatology and hematology in the management of patients with severe SLE with hematological relapses and the need for an integrated therapeutic strategy, including consideration of modern biological therapy, such as anifrolumab, to control disease activity and reduce the infectious risk associated with corticosteroid therapy and cyclophosphamide.

Discussions

The simultaneous onset of systemic lupus erythematosus and a severe infectious process, such as a pulmonary one, is rarely described in the literature, representing a major challenge for early diagnosis and therapeutic management [1,4]. In the reported case, the patient presented with inflammatory joint manifestations, alopecia, asthenia and fever, concomitant with signs orf pulmonary and hematological involvement, which made it difficult to deliniate between autoimmune disease activity and concomitant infection [9,10]. SLE usually manifests with joint, skin or hematological symptoms, while infectious complications occur more frequently secondary to immunosuppressive treatment [11]. In this particular case, the initial clinical picture was dominated by severe pulmonary manifestations – large pulmonary abscess, adjacent cavities and bilateral excavated nodules – which raised the suspicion of pulmonary tuberculosis, especially in the context of hemoptysis. However, GeneXpert and cultures for Mycobacterium tuberculosis were negative, and the etiology was established as a mixed bacterial and fungal infection, with a favorable evolution under targeted antimicrobial treatment.

The major peculiarity of this case is the overlap of the infectious panel with autoimmune and hematological manifestations. Severe pancytopenia, documented at initial admission, required multiple transfusions and imposed a complex differential diagnosis between: autoimmune cytopenia mediated by SLE (positive Coombs, hypocomplementemia) vs. bone marrow suppression induced by infection or sepsis. Infections are one of the main causes of morbidity and mortality in patients with SLE, facilitated by the intrinsic immunodepression of the disease and by immunosuppressive treatments such as corticosteroids and cyclophosphamide [4,5,7]. In our case, the isolation of Pseudomonas aeruginosa and Candida spp. in sputum confirmed the complex nature of the pulmonary process, and the negativity of the GeneXpert test excluded active tuberculosis. Moderate hemoptysis and the evolution towards cavitation required close collaboration between rheumatology and pulmonology, as well as the adjustment of antibiotic and antifungal therapy according to microbiological sensitivities.

Multidisciplinary management proved essential, including corticosteroid therapy, red blood cell and platelet transfusion, combined antibiotic therapy, antifungal, nutritional support and strict monitoring of hematological and imaging parameters. This approach allowed the regression of lung lesions and stabilization of the general condition, demonstrating that early recognition and coordination between specialties are

key factors in reducing complications [6].

Subsequent relapses, with severe leukopenia and cyclophosphamide administration, highlighted the continuing challenge of controlling disease activity and the increased risk of infections. In these contexts, modern therapeutic options, such as anifrolumab – a monoclonal antibody against the type I interferon receptor – have demonstrated efficacy in controlling moderate-to-severe SLE activity, with reductions in SLEDAI scores and a decrease in the cumulative dose of corticosteroids, without significantly increasing the risk of infection [7,8]. Data from the TULIP-1 and TULIP-2 studies support its use in cases refractory to or with contraindications to conventional therapies [12]. In the present case, after stabilization of the infection and normalization of hematological parameters, anifrolumab could represent an optimal therapeutic option, with the aim of reducing relapses and the risk of toxicity associated with corticosteroid therapy.

The presented case also highlights the importance of patient adherence to treatment and rigorous monitoring, as spontaneous interruptions of therapy contributed to exacerbations and additional complications. This confirms that patient education and active involvement in disease management are essential components of the therapeutic strategy..

Conclusions

The presented case emphasizes the diagnostic and therapeutic challenges generated by the concurrent onset of systemic lupus erythematosus and a severe pulmonary infection. This association required a prompt multidisciplinary approach, rigorous monitoring, requiring the involvement of a rheumatologist, a pulmonologist and a hematologist to establish the optimal course of action.

The particularity of the case consists in the overlap of infectious and autoimmune manifestations, with severe hematological impact (pancytopenia) and with major difficulties in balancing the relationship between the control of autoimmune inflammation and the prevention of infectious complications. The clinical evolution demonstrated the need for strict monitoring of the immune and hematological status, as well as the patient's compliance, an essential element for the prevention of relapses and long-term complications.

The experience of this case suggests that the introduction of modern biological therapies, such as anifrolumab, after stabilization of the infectious and hematological episode, could provide better disease control, reduce the need for corticosteroids, and decrease the risk of cumulative toxicity associated with conventional therapies.

Thus, this case represents an illustration of the need for personalized management, based on infectious and autoimmune risk stratification, and confirms that SLE remains a major challenge in clinical practice, requiring both therapeutic innovation and good patient compliance to achieve favorable long-term outcomes.

Conflicts of Interest: The authors declare no conflicts of interest.

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Received: 18.05.2025

Accepted: 11.06.2025