American Journal of Case Reports

e-ISSN 1941-5923
© Am J Case Rep, 2026; 27: e953464
DOI: 10.12659/AJCR.953464

Received: 2026.03.17
Accepted: 2026.08.12
Available online: 2026.11.04
Published: 2026.XX.XX

Leukocytoclastic Vasculitis and Disseminated Intravascular Coagulation After a Single Dose of Ceftriaxone: A Case Report and Review of the Literature

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

ABCDEF Elif Nur Borulday
ABCEF Elif Rüveyda Baysal
ABCDEF Nil Berçem Telçeken
ABCDEFG Mustafa Timurkaan

Department of Internal Medicine, Fethi Sekin City Hospital, Elazig, Türkiye

Corresponding Author: Elif Nur Borulday, Department of Internal Medicine, Elazığ Fethi Sekin City Hospital, Üniversite District, Yahya Kemal Avenue No. 1, 23200 Elazığ, Türkiye
Phone: +90 (535) 051 43 99, e-mail: drelifnurborulday@gmail.com

Financial support: None declared
Conflict of interest: None declared

Patient: Female, 29-year-old
Final Diagnosis: Leukocytoclastic vasculitis
Symptoms: Deterioration of general condition • ecchymosis • hypotension • palpable purpura
Clinical Procedure: —
Specialty: General and Internal Medicine
Objective: Unusual clinical course

Background: Leukocytoclastic vasculitis (LCV) is a small-vessel vasculitis that usually presents with palpable purpura localized to the lower extremities and may occur secondary to infections, drugs, malignancies, or idiopathic causes. Reports of ceftriaxone-associated LCV are limited, and presentation with concomitant disseminated intravascular coagulation (DIC) and onset within hours is exceedingly rare.

Case Report: A 29-year-old woman presented to the emergency department with clinical findings suggestive of a urinary tract infection. She had no known chronic medical conditions or history of regular medication use. Within several hours of receiving a single dose of ceftriaxone, she developed widespread purpura subsequently diagnosed as LCV, accompanied by DIC. At presentation, elevated acute-phase reactants and the clinical findings initially raised suspicion of urosepsis. However, the development of widespread purpuric eruptions over the entire body prompted reconsideration of the diagnosis in favor of drug-induced vasculitis. Rapid clinical and laboratory improvement after discontinuation of the suspected causative drug and initiation of methylprednisolone indicated that a drug-induced process was predominant. Histopathological evaluation of a punch biopsy specimen confirmed the diagnosis of LCV; characteristic features included fibrinoid necrosis and erythrocyte extravasation.

Conclusions: This case emphasizes that LCV can develop rapidly, mimic sepsis at initial evaluation, and occur concomitantly with severe coagulation disorders such as DIC. It also demonstrates the importance of early discontinuation of the causative drug and careful evaluation for systemic complications in patients who present with widespread purpuric eruptions.

Keywords: Ceftriaxone • Disseminated Intravascular Coagulation • Drug-Related Side Effects and Adverse Reactions • Purpura • Vasculitis, Leukocytoclastic, Cutaneous

Full-text PDF: https://www.amjcaserep.com/abstract/index/idArt/953464

2107 6 3 29

Publisher's note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher

APPROVED GALLEY PROOF

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)

Indexed in: [PMC] [PubMed] [Emerging Sources Citation Index (ESCI)] [Web of Science by Clarivate]

APPROVED GALLEY PROOF

Introduction

Leukocytoclastic vasculitis (LCV) is an inflammatory process histopathologically characterized by the accumulation of neutrophils and immune complexes in the walls of small vessels [1,2]. It may develop secondary to various underlying etiologies, including infections, drugs, vaccines, malignancies, systemic diseases, and autoimmune disorders [3]. Rare cases of idiopathic LCV have also been reported [4]. LCV most commonly affects the lower extremities and typically presents as palpable purpura [5,6]. It may also present with urticaria-like papules and plaques. In contrast to urticaria, LCV lesions usually persist for longer than 24 hours. The lesions are typically nonpruritic, and patients commonly report a burning sensation. Ecchymotic lesions may appear after resolution [7]. The manifestations may not be limited to the skin and may involve multiple skin layers, including the epidermis and dermis. Systemic manifestations can also occur, including gastrointestinal, renal, and central nervous system involvement [8].

Case Report

A 29-year-old woman presented to the emergency department with fever, chills, shivering, left lower quadrant abdominal pain, dysuria, pollakiuria, and vomiting. Her medical history included curettage performed at an outside center 3 weeks earlier for endometrial hyperplasia. She had not been hospitalized after the procedure but had been prescribed oral fosfomycin. She reported no history of smoking or alcohol use.

At presentation, the patient was evaluated in the emergency department with a preliminary diagnosis of urinary tract infection based on the predominance of urinary symptoms, particularly dysuria, the recent gynecological procedure, and elevated inflammatory markers. Initial laboratory tests showed a C-reactive protein (CRP) level of 78 mg/L and a leukocyte count of 8000/mm^3; urinalysis revealed leukocytes and erythrocytes. The patient received a single 1-g dose of intravenous ceftriaxone along with symptomatic treatment; she was discharged with a plan for oral antibiotic therapy. Baseline and follow-up laboratory parameters during hospitalization are summarized in **Table 1**.

Table 1. Laboratory parameters monitored from the time of the patient's hospitalization.

*	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
WBC (10^9/L)	8.6	12	10.2	22.4	28.8	18.7	21.8	13.4	12.3
PLT (10^9/L)	184	101	70	93	111	100	149	359	366
CRP (mg/L)	78.05	402.16	400.55	371.58	204.62	93.59	37.56	20.80	23.11
Procalcitonin (µg/L)	-	> 95.73	51.74	27.74	-	7.83	-	0.12	0.06
Amylase (U/L)	-	51	28	27	69	-	382	201	134
Lipase (U/L)	-	20	137	-	89	-	699	319	172
INR	-	1.83	1.29	1.32	1.14	1.18	1.01	1.09	0.95
D-dimer (plasma) (µg/mL)	-	23.49	-	4.08	-	-	2.25	1.08	0.42
Creatine kinase (U/L)	-	455	1991	1539	1185	-	271	86	63
Creatinine (mg/dL)	0.92	2.04	1.19	0.86	0.75	0.69	0.52	0.48	0.6
Urea (mg/dL)	19	51	48	32	45	55	39	25	25
Fibrinogen (g/L)	-	2.23	1.99	2.41	2.29	2.39	2.08	2.23	2.23

Abbreviations: CRP, C-reactive protein; INR, international normalized ratio; PLT, platelet; WBC, white blood cell. * Time points are as follows: (1) the patient's first emergency department presentation (before ceftriaxone administration); (2) the second emergency department presentation (after ceftriaxone administration); (3) the first day of hospitalization (meropenem day 1); (4) day 1 of methylprednisolone and vancomycin treatment; (5) meropenem day 3 and methylprednisolone and vancomycin day 2; (6) after 3 days of methylprednisolone treatment and on vancomycin day 3; (7) methylprednisolone day 7 and after discontinuation of antibiotic therapy; (8) day 12 of hospitalization on the ward; and (9) before discharge.

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)

Indexed in: [PMC] [PubMed] [Emerging Sources Citation Index (ESCI)] [Web of Science by Clarivate]



Figure 1. Clinical appearance of early multisystem mucocutaneous involvement. (**A**) **Extremity lesion (thigh region):** A large, confluent ecchymotic and purpuric plaque with poorly defined borders. (**B**) **Early lip lesion:** Erosion and early hemorrhagic crusting along the vermilion border of the lower lip. (**C**) **Abdominal region:** Scattered, millimetric petechiae and purpura on the abdominal wall. (**D**) **Ocular involvement:** Bilateral subconjunctival hemorrhage and conjunctival hyperemia. (**E**) **Upper extremity:** Widespread purpuric macules and swelling on the dorsum of the hand and forearm. (**F**) **Lower extremities:** Widespread polymorphic purpuric eruptions on the legs and around the ankles. (**G**) **Close-up of cutaneous lesion:** A purpuric patch on the extremity with a reticular pattern and darker central violet discoloration.

As shown in **Figure 1**, a few hours after antibiotic administration, the patient developed widespread non-blanching palpable purpura and ecchymoses throughout the body, watery diarrhea, and deterioration in her general condition. Following this rapid clinical worsening, the patient re-presented to the emergency department. At the second presentation, the CRP level was 402.16 mg/L, procalcitonin level was 95 ng/mL, leukocyte count was 12 000/mm^3, creatinine level was 2.04 mg/dL, international normalized ratio (INR) was 1.83, and D-dimer level was 23.49 µg/mL. Vital signs were as follows: blood pressure, 75/53 mm Hg; temperature, 36.2 °C; SpO_2, 95%; and pulse, 96 beats/min. The clinical presentation was considered

APPROVED GALLEY PROOF

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)

Indexed in: [PMC] [PubMed] [Emerging Sources Citation Index (ESCI)] [Web of Science by Clarivate]

APPROVED GALLEY PROOF

Table 2. International Society on Thrombosis and Haemostasis (ISTH) scoring system for disseminated intravascular coagulation (DIC) [9].

Parameter and value	Points
Platelet count	
• ≥ 100 × 10^9/L	• 0
• 50 to < 100 × 10^9/L	• 1
• < 50 × 10^9/L	• 2
Elevation of fibrin degradation products (D-dimer levels)	
• No increase	• 0
• Moderate increase	• 2
• Strong increase	• 3
Prolongation of prothrombin time (PT)	
• < 3 seconds	• 0
• > 3 but < 6 seconds	• 1
• > 6 seconds	• 2
Fibrinogen level	
• > 1 g/L	• 0
• < 1 g/L	• 1
Total score:	
≥ 5: compatible with overt DIC; repeat scoring daily	
< 5: suggestive of non-overt DIC; repeat scoring within 1-2 days	

The ISTH scoring system is a widely used diagnostic tool for identifying DIC, a potentially fatal syndrome. After all laboratory parameters have been scored, the total score is interpreted as follows: A score of ≥ 5 is considered consistent with overt DIC and indicates a high risk of clinically significant coagulation abnormalities and bleeding complications. A score of < 5 is not considered consistent with overt DIC. However, if clinical suspicion persists, repeat testing is recommended within 1-2 days, depending on the severity of the clinical condition, or at an appropriate follow-up interval [9].

Table 3. Application of the ISTH scoring system using the patient's clinical and laboratory parameters.

Parameter	At presentation during clinical deterioration	Score
Platelet count	101 000/mm^3	0
Fibrin-related markers (fibrin degradation products, D-dimer)	23.49 µg/mL	3
Prothrombin time prolongation	6.3 s	2
Fibrinogen level	2.23 g/L	0
Total score		5

In this case, after clinical deterioration, the International Society on Thrombosis and Haemostasis (ISTH) score was calculated using blood samples obtained at presentation. The platelet count was 101 000/mm^3, corresponding to 0 points in the ISTH scoring system. The D-dimer level was 23.49, indicating a pronounced increase in fibrin-related markers and corresponding to 3 points. The reference range for prothrombin time in our laboratory is 10.5-13.5 seconds; the patient's prothrombin time was 19.8 seconds, representing prolongation of 6.3 seconds and corresponding to 2 points. The fibrinogen level was 2.23 g/L; because this value was above 1 g/L, 0 points were assigned. Overall, the total ISTH score was 5, meeting the criteria for overt disseminated intravascular coagulation (DIC).

consistent with septic shock, and the patient was admitted to the intensive care unit.

At this stage, hemodynamic stabilization was prioritized; intensive fluid replacement and norepinephrine and epinephrine infusions were introduced. The clinical presentation was initially suspected to represent septic shock of infectious origin. The primary differential diagnoses included meningococcemia, urosepsis, and severe bacterial sepsis. The infectious diseases department was consulted regarding antibiotic therapy, and meropenem and vancomycin were initiated.

Because widespread, non-blanching purpuric and ecchymotic lesions that were painful on palpation were observed on the trunk and extremities during physical examination, multidisciplinary consultations were requested. Dermatology consultation primarily considered purpura fulminans and vasculopathy secondary to disseminated intravascular coagulation (DIC). During rheumatology consultation, the patient was evaluated for systemic vasculitides, including Henoch-Schönlein purpura, antineutrophil cytoplasmic antibody (ANCA)-associated vasculitis, and systemic-lupus-erythematosus-associated vasculitis. Systemic rheumatic diseases were excluded based on

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)

Indexed in: [PMC] [PubMed] [Emerging Sources Citation Index (ESCI)] [Web of Science by Clarivate]



Figure 2. Clinical appearance of late multisystem mucocutaneous involvement. (**A**) **Lip involvement:** Hemorrhagic crusts, erosions, and focal desquamation on the upper and lower lips, with prominent mucosal involvement. (**B**) **Oral mucosal and tongue involvement:** Widespread whitish plaques with a pseudomembranous appearance and erythematous areas on the tongue. Fissuring and crusting are present at the corners of the mouth (angular cheilitis). (**C**) **Extremity lesions (thigh region):** Purpuric and ecchymotic patches of varying sizes with irregular borders. (**D**) **Lower extremity involvement:** Widespread non-blanching palpable purpura and large ecchymotic areas on both legs.

the clinical and laboratory findings, raising the possibility of drug-induced vasculitis. Given the thrombocytopenia, prolonged INR, elevated D-dimer, and preserved fibrinogen levels, DIC was suspected, and hematology consultation was requested. The International Society on Thrombosis and Haemostasis (ISTH) scoring system for overt DIC is shown in **Table 2**. When this scoring system was applied to the patient's laboratory findings, the total score was 5, supporting a diagnosis of overt DIC (**Table 3**).

Based on these clinical evaluations, the medical team determined that the condition was unlikely to be of infectious origin and that a strong immunologic/inflammatory mechanism was involved, leading to initiation of high-dose intravenous methylprednisolone (100 mg/day). Pulse steroid therapy was continued for 3 days. After steroid treatment, the patient's hemodynamic status stabilized, vasopressor requirements decreased, and CRP and procalcitonin levels substantially declined. Although procalcitonin is widely used as a biomarker of bacterial infection, elevated levels have also been reported in noninfectious conditions, including trauma, certain carcinomas (eg, small-cell lung carcinoma, medullary thyroid carcinoma, and bronchial carcinoid tumors), burns, cardiogenic shock, and liver cirrhosis, as well as after peritoneal dialysis [10]. In our patient, the elevated procalcitonin level appeared to occur in a noninfectious inflammatory setting and decreased following corticosteroid treatment. This rapid response to corticosteroids made an infectious cause less likely and prompted reconsideration of the diagnostic approach. The empiric antibiotics initiated because of concern for an infectious process

APPROVED GALLEY PROOF

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)

Indexed in: [PMC] [PubMed] [Emerging Sources Citation Index (ESCI)] [Web of Science by Clarivate]

APPROVED GALLEY PROOF

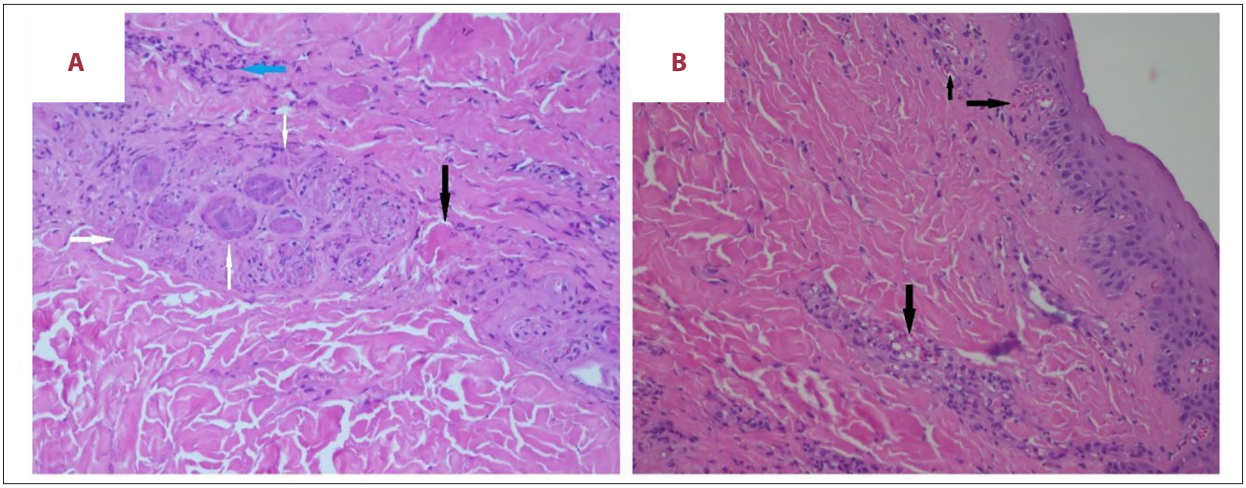


Figure 3. Histopathological examination of the skin biopsy. Microscopic examination of a hematoxylin-and-eosin-stained skin and subcutaneous tissue specimen measuring 0.3 × 0.4 cm, obtained from the patient's lesional skin (× 20 magnification): (**A**) **Dermal section:** Lesions concentrated around vascular structures in the upper and mid dermis. **White arrows:** Perivascular inflammatory infiltration. **Black arrows:** Pink amorphous fibrin deposition (fibrinoid necrosis), indicating vascular injury, within the vascular lumina and vessel walls. **Blue arrow:** Nuclear debris (leukocytoclasia) resulting from fragmentation of inflammatory cells, supporting the diagnosis of leukocytoclastic vasculitis. (**B**) **Epidermal-dermal section: Black arrows:** Extravascular erythrocytes and persistent fibrin deposition in the small vessels of the papillary dermis.

were subsequently discontinued based on this response and guidance from the infectious diseases department.

Sepsis was considered in the differential diagnosis. At presentation, the patient displayed tachycardia, with a heart rate above 90 beats/min; however, her body temperature was within the normal range, respiratory rate did not exceed 20 breaths/min, and white blood cell count was not greater than 12 000/mm^3. According to the historical systemic inflammatory response syndrome (SIRS)-based framework, the patient met only 1 SIRS criterion and did not fulfill the SIRS-based criteria for sepsis [11]. However, because the current Sepsis-3 definition characterizes sepsis as life-threatening organ dysfunction caused by a dysregulated host response to infection rather than infection accompanied by SIRS alone, absence of SIRS was not regarded as the sole basis for excluding sepsis [12]. Given the lack of convincing evidence of infection and the rapid clinical and biochemical response to corticosteroid therapy, sepsis was considered less likely, prompting revision of the initial diagnostic approach.

Methylprednisolone treatment was continued at 64 mg/day for 7 days. The dose was then tapered; the patient received methylprednisolone 32 mg/day for 3 days, 16 mg/day for 7 days, 8 mg/day for 5 days, 4 mg/day for 5 days, and 4 mg every other day for 10 days before discontinuation. Late mucocutaneous findings, including hemorrhagic crusting and epithelial healing changes, are shown in **Figure 2**.

Histopathological examination of the skin biopsy, performed during ongoing treatment, demonstrated superficial and deep dermal perivascular inflammation predominantly composed of polymorphonuclear leukocytes, accompanied by erythrocyte extravasation, fibrinoid necrosis, and cellular debris, as shown in **Figure 3**. These histopathological findings supported a final diagnosis of LCV. Considering the negative autoimmune serologic markers, clinical course, and temporal relationship with antibiotic administration, the patient was diagnosed with LCV secondary to a ceftriaxone-related drug reaction accompanied by DIC. Review of the electronic medical records and direct questioning of the patient revealed no previous exposure to ceftriaxone. Accordingly, the reaction was not attributed to prior sensitization to ceftriaxone. Causality was assessed using the Naranjo Adverse Drug Reaction Probability Scale (**Table 4**) [13]. Previous cases of LCV following ceftriaxone administration have been reported in the literature. In our patient, skin lesions developed within hours after administration of the suspected drug; clinical improvement was observed upon discontinuation of ceftriaxone and initiation of corticosteroid therapy. Ceftriaxone was not re-administered because of the patient's clinical condition and the severity of the reaction. By day 14 of hospitalization, the cutaneous lesions had substantially regressed; concomitant improvement was noted in the patient's clinical status and laboratory parameters. Given the favorable clinical response, the patient was deemed suitable for discharge. Alternative causes that could independently explain the reaction were excluded through clinical, laboratory, and histopathological evaluation. Placebo was not administered, and ceftriaxone levels were not measured

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)

Indexed in: [PMC] [PubMed] [Emerging Sources Citation Index (ESCI)] [Web of Science by Clarivate]

Table 4. Naranjo Algorithm—Adverse Drug Reaction (ADR) Probability Scale [13].

Question	Yes	No	Do not know	Score
1. Are there previous conclusive reports of this reaction?	+1	0	0	+1
2. Did the adverse event appear after the suspected drug was administered?	+2	-1	0	+2
3. Did the adverse event improve when the drug was discontinued or a specific antagonist was administered?	+1	0	0	+1
4. Did the adverse event reappear when the drug was readministered?	+2	-1	0	0
5. Are there alternative causes that could independently have caused the reaction?	-1	+2	0	+2
6. Did the reaction reappear when a placebo was administered?	-1	+1	0	0
7. Was the drug detected in blood or other body fluids at concentrations known to be toxic?	+1	0	0	0
8. Was the reaction more severe when the dose was increased or less severe when the dose was decreased?	+1	0	0	0
9. Did the patient have a similar reaction to the same or similar drugs during any previous exposure?	+1	0	0	0
10. Was the adverse event confirmed by any objective evidence?	+1	0	0	+1
	Total Score:	Total Score:	Total Score:	Total Score: 7

The Naranjo Algorithm, also known as the ADR Probability Scale, is a standardized questionnaire widely used to assess the likelihood that an observed adverse event is related to drug therapy. The scale consists of 10 questions evaluating criteria such as the temporal relationship, presence of alternative causes, dose-response relationship, drug levels, and previous exposure to the drug. Based on the total score, the probability of an adverse drug reaction is classified as definite, probable, possible, or doubtful. Application of the Naranjo Algorithm to the present case resulted in a total score of 7.

Table 5. Naranjo Algorithm Interpretation.

Score	Interpretation of scores
Total score ≥ 9	Definite. The reaction (1) followed a reasonable temporal sequence after drug administration or occurred when a toxic drug level had been established in body fluids or tissues, (2) followed a recognized response to the suspected drug, and (3) improved after drug withdrawal and reappeared upon reexposure
Total score 5 to 8	Probable. The reaction (1) followed a reasonable temporal sequence after drug administration, (2) followed a recognized response to the suspected drug, (3) improved after drug withdrawal but was not confirmed by reexposure, and (4) could not reasonably be explained by known characteristics of the patient's clinical condition
Total score 1 to 4	Possible. The reaction (1) followed a temporal sequence after drug administration, (2) possibly followed a recognized response to the suspected drug, and (3) could be explained by characteristics of the patient's disease
Total score ≤ 0	Doubtful. The reaction was likely attributable to factors other than the drug

≥ 9 points: Definite adverse drug reaction (ADR)—There is a strong and clear causal relationship between the drug and the adverse reaction. 5-8 points: Probable ADR—The relationship between the drug and the adverse reaction is likely but not certain.
1-4 points: Possible ADR—The relationship between the drug and the adverse reaction is weak; alternative causes are also plausible.
≤ 0 points: Doubtful ADR—There is little or no evidence of a relationship between the drug and the adverse reaction.

APPROVED GALLEY PROOF

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)

Indexed in: [PMC] [PubMed] [Emerging Sources Citation Index (ESCI)] [Web of Science by Clarivate]

APPROVED GALLEY PROOF

Table 6. Previously reported cases of ceftriaxone-associated leukocytoclastic vasculitis [20,27-29].

Publication	Age (years)	Sex	Duration of antibiotic use	Cutaneous involvement	Systemic involvement	Treatment	Outcome
Agrawal et al, 2014 [27]	17	Female	5 days	Yes	Renal involvement	Discontinuation of antibiotics and systemic corticosteroids	5 days
Raina et al, 2018 [28]	61	Male	3 days	Yes	No	Discontinuation of antibiotics	10 days
Haehn et al, 2019 [29]	35	Male	14 days	Yes	No	Discontinuation of antibiotics and systemic corticosteroids	Unknown
Almasoudi et al, 2022 [20]	49	Female	2 days	Yes	No	Discontinuation of antibiotics and systemic corticosteroids	1 month
Present case, 2026	29	Female	Single dose	Yes	DIC	Discontinuation of ceftriaxone and systemic corticosteroids	14 days

This table summarizes previously reported cases of ceftriaxone-associated leukocytoclastic vasculitis alongside the present case. It presents patient demographics (age and sex), duration of antibiotic exposure, extent of clinical involvement (cutaneous and systemic), treatment, and clinical outcomes. In all reported cases, discontinuation of the offending antibiotic was the foundation of management, frequently combined with systemic corticosteroid therapy. Recovery time varied among cases; in the present case, clinical improvement was achieved within 14 days after discontinuation of ceftriaxone and initiation of systemic corticosteroids.

in blood or other body fluids. The patient was not exposed to a toxic dose, and the reaction occurred after administration of a standard dose. No dose reduction or escalation was performed, and the drug was not re-administered. The adverse event was objectively supported by skin biopsy findings consistent with LCV. Based on these findings, the Naranjo score was calculated as 7, indicating a probable ceftriaxone-associated adverse drug reaction (**Table 5**).

The coexistence of DIC and purpuric skin lesions initially raised the possibility of infection-associated purpura fulminans. However, purpura fulminans typically begins as retiform, reddish-blue purpuric lesions with a livedo racemosa-like pattern, predominantly involving acral areas such as the nose, feet, and knees. Histopathologically, fibrin-rich microvascular thrombosis is the predominant finding [14]. In our patient, purpura fulminans was considered less likely because of the lesion distribution, histopathological findings consistent with LCV, absence of convincing evidence of infection, and rapid response to corticosteroid therapy.

Discussion

The annual incidence of LCV is approximately 15 to 38 cases per million population [8]. Approximately 50% of cases are idiopathic, whereas the remaining 50% are secondary to other causes [15]. In a recent study, antibiotic use and infectious agents ranked second among the reported etiologies [16]. LCV may remain limited to the skin; however, systemic manifestations, including renal, pulmonary, and ocular involvement, can occur in approximately 30% of cases. Joint involvement is reportedly the most common extracutaneous manifestation [17].

Although many drugs can cause drug-induced LCV, beta-lactam antibiotics are the antibiotic class most often implicated. Penicillins, particularly amoxicillin and ampicillin, and cephalosporins are the most frequently reported agents in the literature [18]. Although less common, macrolides (eg, clarithromycin and erythromycin) and tetracyclines, particularly minocycline, have been associated with LCV. Minocycline has also been associated with the development of antineutrophil cytoplasmic antibody (ANCA)-associated vasculitis [19].

A literature review published in 2022 identified 66 cases of antibiotic-induced LCV. Five cases were associated with cephalosporins, including 4 that developed after ceftriaxone administration [20]. In our literature search for reports published after that review, we identified 6 additional cases, 1 of which was associated with a cephalosporin [21-26]. Including the present case, 73 cases of antibiotic-induced LCV have been reported, including 6 associated with cephalosporins and 5 associated with ceftriaxone. Previously reported cases of ceftriaxone-associated LCV included in this comparison are summarized in **Table 6**.

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)

Indexed in: [PMC] [PubMed] [Emerging Sources Citation Index (ESCI)] [Web of Science by Clarivate]

The present case appears to differ from previously reported cases of ceftriaxone-associated LCV because the reaction developed after a single dose and exhibited a shorter latency period. Additionally, the concomitant occurrence of DIC represents an unusual feature that has not been emphasized in previous reports.

As summarized in **Table 6**, among the reported cases of ceftriaxone-associated LCV, 3 patients were female and 2 were male. The diagnosis was established by skin biopsy in all cases. The primary management approach in all cases was discontinuation of the causative drug. Corticosteroid therapy was administered in 4 of the 5 reported cases. The duration of antibiotic use before LCV onset ranged from 2 to 14 days in previously reported cases. In contrast, our patient developed LCV within hours after a single dose. Systemic involvement, including renal involvement, was reported in 1 previous case. Our case differs from those previously reported in that LCV developed within hours after a single dose of ceftriaxone and was accompanied by DIC.

Conclusions

This case demonstrates that ceftriaxone-associated LCV is not only a rare drug reaction but can also occur much earlier than the expected latency period and be accompanied by severe systemic complications. Although most reported cases have involved skin-limited disease or limited systemic involvement, the rapid development of disseminated intravascular coagulation in the present case suggests that immune-mediated vascular injury can trigger a severe inflammatory response in some patients. Thus, in patients who develop sudden purpuric eruptions after drug exposure, clinicians should consider not only cutaneous vasculitis but also potential systemic complications. Clinical presentation within hours after a single dose suggests rapid activation of the immune response, even in the absence of known prior exposure. However, the pathophysiological basis of this association requires further investigation. Accordingly, the present case emphasizes the importance of early recognition of rare but potentially severe antibiotic-associated vasculitic reactions and highlights the need for careful evaluation of systemic involvement in patients who develop sudden purpuric lesions, particularly after ceftriaxone administration.

Acknowledgements

We would like to express our gratitude to Specialist Dr. Sait Fatih Öner for his support during the monitoring and treatment of the patient in the intensive care unit, to Specialist Dr. Alper Koç for his valuable contributions during hematology consultations, to Specialist Dr. Tuncer Şak for his support in rheumatology consultations, to Prof. Dr. Gülden Eser Karlıdağ for her contribution to the management of the patient's antibiotic therapy, to Specialist Dr. Harun Yıldırım for obtaining the biopsy specimen from the lesions, and to Specialist Dr. Nezahat Yıldırım for her assistance with the examination and reporting of the pathology slides.

Department and Institution Where Work Was Done

Elazig Fethi Sekin City Hospital, Elazig, Türkiye.

Patient Consent

The patient provided informed consent for publication of this report and accompanying images.

Declaration of Figures' Authenticity

All figures submitted have been created by the authors who confirm that the images are original with no duplication and have not been previously published in whole or in part.

APPROVED GALLEY PROOF

References:

1. Bhesania S, Raol K, Medina C, et al. Leukocytoclastic vasculitis: Depiction of the diagnostic dilemma. Cureus. 2021;13(8):e17462
2. Órfão A, Madeira D, Duarte DM, Galante Pereira F, Matos C. Gabapentin-induced cutaneous leukocytoclastic vasculitis: A case report. Cureus. 2023;15(9):e44616
3. Sakkab R, Fabrikant JM. Leukocytoclastic vasculitis of the foot and ankle: A case report with over five-year follow-up. Cureus. 2022;14(5):e25371
4. Strubchevska K, Kozyk M, Balanescu DV. A case report of leukocytoclastic vasculitis: Diagnostic approach and treatment. Am J Case Rep. 2023;24:e939541
5. Cakiter AU, Kucuk OS, Ozkan DB, et al. Demographic characteristics, aetiology, and assessment of treatment options in leukocytoclastic vasculitis. Postepy Dermatol Alergol. 2017;34(2):104-9
6. Ball-Burack MR, Kosowsky JM. A case of leukocytoclastic vasculitis following SARS-CoV-2 vaccination. J Emerg Med. 2021;63(2):e62-65
7. Fraticelli P, Benfaremo D, Gabrielli A. Diagnosis and management of leukocytoclastic vasculitis. Intern Emerg Med. 2021;16(4):831-41
8. Tezcan D, Limon M, Gülcemal S, Yılmaz S. Lökositoklastik vaskülitli hastaların demografik, etyolojik ve klinik özellikleri: tek merkez deneyimi. J Contemp Med. 2019;9(4):395-99 [in Turkish]
9. Mayne ES, Mayne A, Louw S. Diagnosis of human immunodeficiency virus associated disseminated intravascular coagulation. PLoS One. 2022;17(1):e0262306
10. Hatzistilianou M. Diagnostic and prognostic role of procalcitonin in infections. ScientificWorldJournal. 2010;10:1941-46
11. Bone RC, Balk RA, Cerra FB, et al. Definitions for sepsis and organ failure and guidelines for the use of innovative therapies in sepsis. Chest. 1992;101(6):1644-55
12. Singer M, Deutschman CS, Seymour CW, et al. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). JAMA. 2016;315(8):801-10
13. Naranjo CA, Busto U, Sellers EM, et al. A method for estimating the probability of adverse drug reactions. Clin Pharmacol Ther. 1981;30:239-45

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)

Indexed in: [PMC] [PubMed] [Emerging Sources Citation Index (ESCI)] [Web of Science by Clarivate]

14. Bendapudi PK, Losman JA. How I diagnose and treat acute infection-associated purpura fulminans. Blood. 2025;145(13):1358-68
15. Ramteke V, Pattewar S, Barde N, Deshpande N. Sirolimus-induced leukocytoclastic vasculitis. Korean J Transplant. 2023;37(4):310-12
16. Ertekin SS, Koku Aksu AE, Leblebici C, et al. Systemic disease in leukocytoclastic vasculitis: A focus on direct immunofluorescence findings. An Bras Dermatol. 2022;98(1):59-67
17. Nasseri M, Jia JL, Crofoot J. Systemic involvement of leukocytoclastic vasculitis in skin of color. Cureus. 2025;17(4):e82105
18. Kang S, Amagai M, Bruckner AL, et al, editors. Fitzpatrick's Dermatology. 9th ed. New York: McGraw-Hill; 2019
19. Grau RG. Drug-induced vasculitis: new insights and a changing lineup of suspects. Curr Rheumatol Rep. 2015;17(12):71
20. Almasoudi AA, Bablghait ES, Alaauldeen S, et al. Ceftriaxone-induced leukocytoclastic vasculitis: A case report and review of the literature. J Int Med Res. 2022;50(5):03000605221097768
21. Carrasquel M, Quasem K, Patterson T, et al. Vicious Vanco: Vancomycin-induced cutaneous small-vessel vasculitis in a patient with end-stage renal disease. Cureus. 2026;18(1):e101537
22. Singh I, Gidda H, Nashed B. Vancomycin-induced leukocytoclastic vasculitis: A rare complication of a commonly used drug. Cureus. 2023;15(3):e36532
23. Bhatt P, Montreuil N, Olayiwola A, et al. Leukocytoclastic vasculitis caused by sulfamethoxazole-trimethoprim. Clin Case Rep. 2024;12(2):e8437
24. Shivarajpur A, Londono S, Shaw J, et al. Drug-induced leukocytoclastic vasculitis secondary to trimethoprim/sulfamethoxazole: A case report. Clin Pract Cases Emerg Med. 2025;9(1):61-64
25. Cabrita A, Gonçalves PL, Marques CA. Ciprofloxacin-induced leukocytoclastic vasculitis. Cureus. 2025;17(2):e78662
26. Tang W, Tan J. Cephalexin-induced leukocytoclastic vasculitis. Cureus. 2022;14(7):e26545
27. Agrawal SR, Rajput A, Jain AP. Leukocytoclastic vasculitis and acute allergic interstitial nephritis following ceftriaxone exposure. J Pharmacol Pharmacother. 2014;5:268-70
28. Raina AI, Bilal J, Sipra QUAR, Chamarthi G. Ceftriaxone-associated leukocytoclastic vasculitis. Am J Ther. 2018;25(2):e281-82
29. Haehn DA, Patel A, Youngberg G, Gonzalez-Estrada A. Ceftriaxone-induced leucocytoclastic vasculitis. BMJ Case Rep. 2019;12(4):e229411

APPROVED GALLEY PROOF

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)

Indexed in: [PMC] [PubMed] [Emerging Sources Citation Index (ESCI)] [Web of Science by Clarivate]