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Severe Thrombocytopenia As A Life-threatening Complication Of Primary Epstein-barr Virus Infection In A Young Adult: A Case Report

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ABSTRACT

Background:

Epstein–Barr virus (EBV) infection commonly manifests as infectious mononucleosis and is usually benign. However hematologic complications such as immune thrombocytopenia may occur and can be severe. Thrombocytopenia identified in the emergency department requires prompt evaluation to rule out life-threatening conditions including disseminated intravascular coagulation, thrombotic microangiopathy, and purpura fulminans.

Case Report:

A healthy 27-year-old man presented with fever, lumbar pain and dysuria. Initial laboratory testing revealed isolated thrombocytopenia (39 × 10/L) which rapidly deteriorated to < 5 × 10/L within 48 hours. He developed persistent bleeding at a venipuncture site, hemorrhagic oral bullae and purpura. Imaging showed presence of splenomegaly. Peripheral smear showed presence of activated hyperbasophilic lymphocytes. Serologic testing confirmed acute EBV infection. The findings supported a diagnosis of EBV-associated immune thrombocytopenia. The patient was admitted to the intensive care unit due to the high risk of hemorrhage and received intravenous immunoglobulin followed by corticosteroids. Clinical status and platelet counts improved rapidly and patient could be discharged after six days.

Conclusion:

Acute EBV infection should be recognized as a potential cause of severe isolated thrombocytopenia in adults. Early identification can prevent unnecessary invasive investigations and enable timely initiation of immunomodulatory therapy. Although infectious mononucleosis is usually self-limited its hematologic complications, such as severe thrombocytopenia, may be life-threatening.

Keywords: Epstein–Barr virus, Immune thrombocytopenia, Infectious mononucleosis, Intravenous Immunoglobulin.

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INTRODUCTION

The Epstein–Barr virus (EBV) is a herpesvirus transmitted mainly through close contact, particularly via saliva, from an infected individual.[1] Primary infection is often asymptomatic but may manifest as infectious mononucleosis. This condition is classically characterized by a triad of fever, tonsillar hypertrophy, and cervical lymphadenopathy. However, other symptoms such as myalgia, palatal petechiae, or organomegaly may also occur, and the classical triad may be incomplete in some cases.[2]
Serological testing confirms the diagnosis by detecting anti–viral capsid antigen (VCA), IgM antibodies specific to EBV. In the general adult population, EBV seropositivity is very common, with 90–95% of individuals exhibiting VCA IgG antibodies due to prior immunization or past infection.[3]
Thrombocytopenia is defined as a platelet count below 150 × 10/L. It is often asymptomatic when mild, but moderate thrombocytopenia (50–99 × 10/L) may present with non-blanching petechiae or ecchymoses. When platelet counts fall below 50 × 10/L, the risk of severe hemorrhage—including gastrointestinal, urinary, or intracranial bleeding—increases significantly, often accompanied by hemorrhagic oral bullae.
Thrombocytopenia may result from decreased platelet production (central causes) or increased peripheral destruction. Peripheral mechanisms include immune-mediated platelet destruction, excessive platelet consumption due to thrombus formation, splenic sequestration, hemodilution, or in vitro platelet aggregation during sample analysis.[4]

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CASE REPORT

A 27 years-old man with no significant medical history or allergies presented with fever (102.2 °F), left lumbar pain and dysuria for five days. He was referred to the emergency department for suspected pyelonephritis. On examination, he was hemodynamically stable and febrile (102 °F) with no lumbar tenderness or signs of sepsis.Urine dipstick testing showed mild ketonuria without leukocyturia or hematuria. Laboratory results revealed thrombocytopenia (39 × 10/L) with normal hemoglobin, mild inflammatory response (CRP 49 mg/L), and no leukocytosis. The automated hematology analyzer (pocH-100™) reported an error in leukocyte differentiation, and repeated tests confirmed persistent thrombocytopenia (58 × 10/L). The patient was discharged with ciprofloxacin 500 mg twice daily for 14 days, acetaminophen for fever, and instructions for repeat testing after 48 hours.

Two days later, he returned to the emergency department with persistent bleeding from the venipuncture site lasting more than one hour. Physical examination revealed hemorrhagic oral bullae and purpura on the upper limbs. He reported diffuse myalgia but no neurological or abdominal symptoms. Laboratory testing showed profound thrombocytopenia (< 5 × 10/L).

Comprehensive investigations, including blood cell count, coagulation profile, renal and hepatic function tests, and thoraco-abdomino-pelvic contrast-enhanced CT were performed. Imaging revealed marked splenomegaly. A bone marrow aspiration was attempted twice without success (Figure 1).

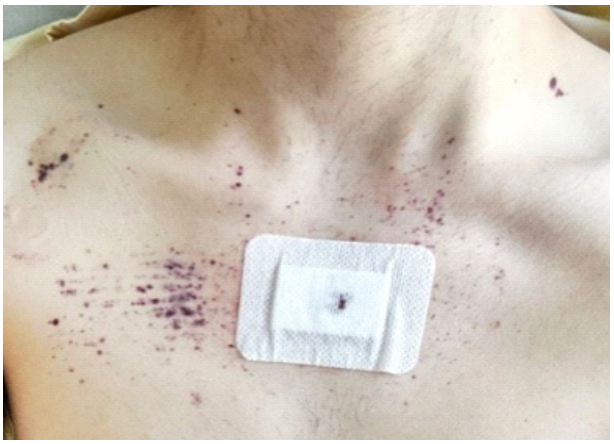

Figure 1. Purpura on the torso after bone marrow aspirate attempts.

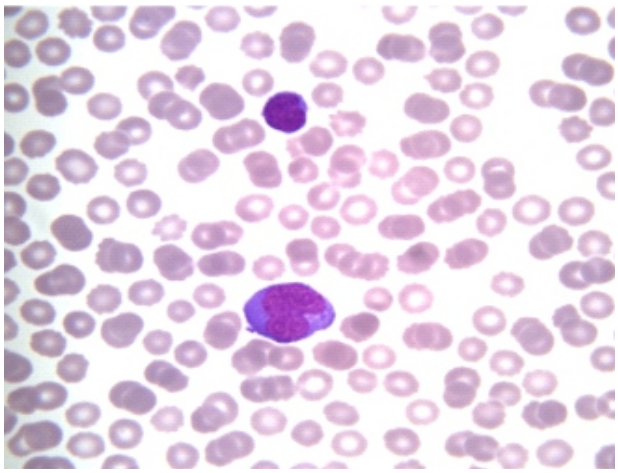

Figure 2. Activated hyperbasophilic lymphocytes between a normal-sized one on peripheral blood smear (Wright–Giemsa stain, oil immersion, magnification ×1000)

Serologic testing confirmed acute EBV infection. No other cytopenias were observed, and hemolysis markers were normal, ruling out TMA or DIC. Examination of peripheral smear showed activated hyperbasophilic lymphocytes. Given the isolated severe thrombocytopenia and evidence of acute EBV infection, immune thrombocytopenia related to infectious mononucleosis was diagnosed. (Figure 2).

The patient was admitted to the intensive care unit for close monitoring due to the high risk of hemorrhage and splenic rupture. Intravenous immunoglobulin therapy was initiated, followed by intravenous corticosteroids at 1 mg/kg/day, later transitioned to oral corticosteroids with tapering (40 mg daily for one week, then 20 mg daily for one week). Folic acid and weekly platelet count monitoring were prescribed.

The patient showed rapid clinical improvement, with cessation of bleeding and progressive normalization of platelet counts. He was discharged after six days of hospitalization with outpatient follow-up. No relapse or further complications were reported during follow-up.

DISCUSSION

Thrombocytopenia discovered in the emergency department must not be underestimated. False thrombocytopenia due to platelet clumping must first be excluded, either by repeating the blood draw in a sodium citrate tube or by performing a manual platelet count by a trained biologist. Etiology of thrombocytopenia must be determined with the help of relevant diagnostic investigations (Table 1).

The initial diagnostic work-up should include a complete blood count, C-reactive protein (CRP), renal and hepatic function tests, lactate dehydrogenase (LDH), haptoglobin, bilirubin, and coagulation studies with fibrinogen dosage, factor V activity, D-dimer levels, prothrombin time (PT or Quick), and activated partial thromboplastin time (aPTT).

In the presence of clinical or laboratory signs of infection, further investigations should include blood cultures (in case of fever), as well as serologic testing for HIV, hepatitis A, B, and C viruses, Epstein–Barr virus (EBV), cytomegalovirus (CMV), and herpes simplex virus types 1 and 2. Additional tests to consider include serum protein electrophoresis, thyroid function tests, vitamin B9 and B12 levels, Helicobacter pylori testing (urease breath test or stool antigen), and a contrast-enhanced thoraco-abdomino-pelvic CT scan, especially in cases of severe thrombocytopenia of unclear origin.

The emergency physician facing severe thrombocytopenia must promptly exclude life-threatening conditions such as purpura fulminans, disseminated intravascular coagulation (DIC), and thrombotic microangiopathy (TMA).[5]

The diagnosis of purpura fulminans is primarily clinical and may be confirmed by lumbar puncture when appropriate. In cases of DIC, coagulation studies typically reveal prolonged PT and aPTT, elevated D-dimers, and decreased fibrinogen levels. When anemia is also present, the detection of schistocytes on the peripheral smear, along with elevated reticulocyte count, LDH, indirect bilirubin, and low haptoglobin, suggests mechanical hemolysis, consistent with a thrombotic microangiopathy.[6]

A decreased reticulocyte count, on the other hand, points toward a central production defect. In such cases, the peripheral smear may reveal circulating blasts suggestive of myelodysplastic syndrome or hematologic malignancy. Activated lymphocytes on the smear may orient the diagnosis toward infectious mononucleosis.[7]

A bone marrow aspiration should be performed promptly if central thrombocytopenia is suspected—especially in the presence of additional cytopenias or clinical signs of malignancy such as lymphadenopathy or organomegaly.

Causes	Etiologies	Complementary investigations
Consumptive coagulopathy / Microangiopathic processes	Disseminated intravascular coagulation (DIC)	Fibrinogen, factor V, D-dimers, PT, aPTT
	Thrombotic microangiopathy	Peripheral smear (schistocytes), reticulocytes, haptoglobin, LDH, free bilirubin
	Thrombotic thrombocytopenic purpura (TTP)	Anti-ADAMTS13 antibodies
Bacterial infection	Purpura fulminans	Clinical diagnosis, lumbar puncture for confirmation
	Helicobacter pylori infection	Urease breath test, stool antigen test
Oncologic disorders	Myelodysplasia, hematologic malignancy	Bone marrow aspirate, thoraco-abdomino-pelvic CT scan
Viral infection	HIV, HBV, HCV, EBV, CMV, Parvovirus B19, HSV	Serologies for HIV, HBV, HCV, EBV, CMV, Parvovirus B19, HSV1–2
Chronic liver disease	Hypersplenism, portal hypertension	Liver function tests, abdominal ultrasound
Storage diseases	–	Hepatic panel, abdominal ultrasound, enzymatic assays
Immune thrombocytopenia	Evans syndrome	Direct Coombs test, haptoglobin, LDH, bilirubin, antineutrophil antibodies
	Systemic lupus erythematosus / antiphospholipid syndrome	Lupus anticoagulant, anticardiolipin, anti–β2-GP1, ANA, anti-DNA, anti-ENA
	Autoimmune thyroid disease / Graves' disease	TSH, anti-thyroid peroxidase antibodies, anti-TRAK, anti-thyroglobulin
Iatrogenic	Heparin-induced thrombocytopenia	Anti-PF4 antibodies
	Post-transfusion purpura	Anti-HPA1a antibodies
Nutritional deficiencies	Vitamin B12 and B9 deficiency	Serum vitamin B12 and B9
Primary immunodeficiency	Common variable immunodeficiency, lymphoproliferative autoimmune syndromes	Serum protein electrophoresis
Hereditary thrombocytopenia	von Willebrand disease, MYH9-related syndromes, Wiskott–Aldrich syndrome, X-linked thrombocytopenia	von Willebrand factor, peripheral smear (Döhle bodies, microplatelets), karyotype

Table 1. Main etiologies of thrombocytopenia and complementary diagnostic investigations.

In contrast, an isolated thrombocytopenia associated with a compatible clinical presentation and no other abnormalities supports the diagnosis of immune thrombocytopenia (ITP) or viral etiology as such as EBV infection. In such cases, bone marrow aspiration is unnecessary, though it is more often performed in adults than in children when diagnostic uncertainty persists.[8]

Recent studies have reported an increasing incidence of infectious mononucleosis in developed countries due to delayed primary EBV infection. Consequently, more severe forms now occur in young adults without comorbidities. A French study demonstrated that the later the infection occurs, the higher the risk of hospitalization and longer hospital stay.[9]

In adults, diagnosis is often delayed because atypical or severe complications predominate, such as hepatosplenomegaly, severe odynophagia, jaundice, or neurological involvement. Laboratory findings may show intense inflammatory response, marked lymphocytosis, and hepatic cytolysis, suggesting a dysregulated immune reaction. Complications include neurological syndromes (meningitis, encephalitis, Guillain–Barré), hepatic failure, hemolytic anemia, and severe thrombocytopenia. Life-threatening hemorrhagic events related to EBV-induced immune thrombocytopenia have been rarely described. Although usually benign, its complications can be severe and justify ICU admission for close observation.[10]

CONCLUSION

Thrombocytopenia discovered in the emergency department should never be overlooked. After ruling out purpura fulminans, disseminated intravascular coagulation (DIC), and thrombotic microangiopathy, an etiological work-up must be conducted promptly and comprehensively from the outset. This should include exclusion of hematologic malignancies and systematic evaluation for viral causes.

Given the increasing incidence of infectious mononucleosis among young adults, this differential diagnosis should be considered early to prevent unnecessary and invasive investigations. Although infectious mononucleosis is most often benign, potential complications must always be assessed, as some may be life-threatening and require admission to an intensive care unit for close monitoring.

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REFERENCES

1. Odumade OA, Hogquist KA, Balfour HH Jr. Progress and problems in understanding and managing primary Epstein -Barr virus infections. Clin Microbiol Rev 2011;24:193–209.
2. Luzuriaga K, Sullivan JL. Infectious mononucleosis. N Engl J Med 2010;362:1993–2000.
3. Koçak M, Güven D. Complications of infectious mononucleosis in children. Med J Islam World Acad Sci 2020;28:61–71.
4. Gauer RL, Whitaker DJ. Thrombocytopenia: evaluation and management. Am Fam Physician 2022;106:288–98.
5. Ashworth I, Thielemans L, Chevassut T. Thrombocytopenia: the good, the bad and the ugly. Clin Med (Lond). 2022 May;22(3):214-217. doi: 10.7861/clinmed.2022-0146.
6. Arnold DM, Patriquin CJ, Nazy I. Thrombotic microangiopathies: a general approach to diagnosis and management. CMAJ. 2017 Jan 30;189(4):E153-E159. doi: 10.1503/cmaj.160142. Epub 2016 Oct 17.
7. Pinto MPB. Infectious mononucleosis by Epstein-Barr virus: A complete laboratory picture. Hematol Transfus Cell Ther. 2024 Apr-Jun;46(2):210-211. doi: 10.1016/j.htct.2023.10.002. Epub 2023 Dec 5.
8. Stensby JD, Long JR, Hillen TJ, Jennings JW. Safety of bone marrow aspiration and biopsy in severely thrombocytopenic patients. Skeletal Radiol. 2021 May;50(5):915-920. doi: 10.1007/s00256-020-03623-5. Epub 2020 Oct 4.
9. Hocqueloux L, Causse X, Valery A, et al. The high burden of hospitalizations for primary EBV infection: a 6-year prospective survey in a French hospital. Clin Microbiol Infect 2015;21:1041.e1–1041.e7.
10. Walter RB, Hong TC, Bachli EB. Life-threatening thrombocytopenia associated with acute Epstein-Barr virus infection in an older adult. Ann Hematol. 2002 Nov;81(11):672-5. doi: 10.1007/s00277-002-0557-1. Epub 2002 Oct 29.

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Author Contribution:-

· MR : patient care, data collection, manuscript drafting, literature review, supervision· CP : patient care, data collection, manuscript drafting· SD,SM : manuscript revision SM: manuscript revision

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