



## Case Report

# Splenic Complications Related to Epstein-Barr Infectious Mononucleosis; Case Reports and a Literature Review.

Joe Kadou<sup>1</sup>, Halit Ozel<sup>1</sup>, Ayoub Jaafari<sup>2</sup>, Karim Bochouari<sup>2</sup>, Rachid Attou<sup>2</sup>

<sup>1</sup>Emergency Care Department, CHIREC Delta Hospital, 1160 Auderghem, Belgium

<sup>2</sup>Intensive Care Unit Department, C.H.U Brugmann, 1160 Auderghem, Belgium

\*Corresponding author: Ayoub Jaafari, Intensive Care Unit Department, C.H.U Brugmann, 1160 Auderghem, Belgium

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## Abstract

Epstein-Barr virus (EBV) is one of the most lymphocytophilic human herpesvirus transmitted primarily through saliva and blood and mostly affects children and young adults. The most widely known form of the virus, primary infectious mononucleosis (MI), manifests itself as tiredness, uneasiness, sore throat, and enlargement of the cervical lymph nodes, liver, or spleen, which typically resolves spontaneously within a few weeks. While this infection is benign, self-limited, and carries a good prognosis, rare but life-threatening complications may arise. According to the literature, only 0.1% to 0.5% of patients with infectious mononucleosis will develop an infarct or splenic rupture, which remains the most common fatal complication in this disease. Herein, we present 2 rare cases of splenic complications in the setting of infectious mononucleosis, along with a comprehensive review of the literature.

## Introduction

Epstein-Barr virus (EBV) is a highly prevalent B-lymphotropic  $\gamma$ -herpes virus affecting over 90% of adults in the general population [1]. Generally, EBV is acquired through oral secretion early in life and persists as a quiescent or active pathogen throughout the life of infected individuals [2]. In developed countries, the age of primary infection has increased progressively over time, with the highest incidence occurring at 15–24 years, as better socio-economic status is associated with a lower age-related prevalence of antibodies [3]. Primary infectious mononucleosis (MI), a well-known virus presentation, is typically characterized by tiredness, uneasiness, sore throat, and enlargement of the cervical lymph nodes, liver, or spleen, which normally resolves spontaneously within a few weeks [4]. In some cases, rare complications such as infarct or splenic rupture may occur, and endanger the patient's life prognosis. While only occurring in 0.1% to 0.5% of cases,

splenic rupture remains the most frequently fatal complication of the disease [5]. Herein we present 2 rare cases of splenic complication in the setting of infectious mononucleosis, alongside a comprehensive review of the literature.

## Case Presentation

### First Case

We report on a 44-year-old man who was admitted to the emergency department with abdominal complaints that had been progressing poorly for several days. The pain was exacerbated by postural changes and relieved by lying down. The notion of a 'pinkish' macular skin rash that disappeared 5 days ago was noted. No other complaints were mentioned. He has no noteworthy medical or surgical history. On admission, the clinical parameters were as follows: blood pressure of 126/85mm Hg, heart beam rate of 94 beats per minute, the temperature of 37.4°C, oxygen saturation of

98% on room air, and associated respiratory rate of 15/min. The clinical examination showed small bilateral cervical adenopathy's, a left shoulder pain, and a reassuring cardiorespiratory and neurological profile. Abdominal examination revealed tenderness in the hypochondrium and left iliac flank, with no guarding or wooden belly. Given these findings, an admission biology and imaging examination were carried out. The laboratory showed a reassuring hemogram, elevated white blood cells with lymphocyte predominance, an inflammatory syndrome with CRP at 4.7mg/dL, preserved coagulation, normal renal function, significant cytolysis (AST 171U/L and ALT 275U/L; N <40) and cholestasis (yGT 160U/L; N < 60, and PAL 194U/L; N 40-130) with bilirubin in the normal range. Viral serologies including CMV, EBV, ParvoB19, measles/rubella, herpes, and hepatitis were performed and were positive for EBV. Abdominal ultrasound and CT imaging showed hepatosplenomegaly, peri-splenic fluid, and associated peri-splenic haemorrhage (Figure 1). The diagnosis of splenic haemorrhage due to EBV was retained, and the patient was hospitalized with a favourable clinical-biological and radiological evolution.

## Second Case

We report the case of a 17-year-old woman admitted to the emergency department with her beloved for 2 days of worsening abdominal pain, vomiting, and fever up to 38,1°C. No other complaints were reported. No other complaints were reported. The patient reports that a viral infection is probably inherited from her boyfriend, who was ill 2 weeks ago. Her medical and surgical history was unremarkable—no notable medication at home. On admission, the clinical parameters were as follows: blood pressure of 112/78mm Hg, heart beam rate of 110 beats per minute, temperature of 37.9°C, oxygen saturation of 94% on room air, and associated respiratory rate of 18/min. Her clinical examination revealed bilateral cervical adenopathy, pharyngitis, and a reassuring cardiopulmonary and neurological examination. Nonetheless, we noticed a marked pain in the left hypochondrium, associated with a discreet tenderness. Given these findings, an admission biology and imaging examination were carried out. The laboratory showed a reassuring hemogram, elevated white blood cells with lymphocyte predominance, an inflammatory syndrome with CRP at 12,5mg/dL, preserved coagulation, normal renal and significant cytolysis (AST 82U/L and ALT 126U/L; N <40) and cholestasis (yGT 159U/L; N < 60, and PAL 232U/L; N 40-130) with bilirubin in the normal range. Viral serology included CMV, EBV,

ParvoB19, measles/rubella, herpes, and hepatitis, and EBV came back positive. Abdominal CT imaging showed splenomegaly and splenic hypodensities with suspicion of spleen infarction (Figure 2). The diagnosis of splenic infarction due to EBV was retained, and the patient was treated by anticoagulation and hospitalized with significant clinical-biological and radiological outcomes.

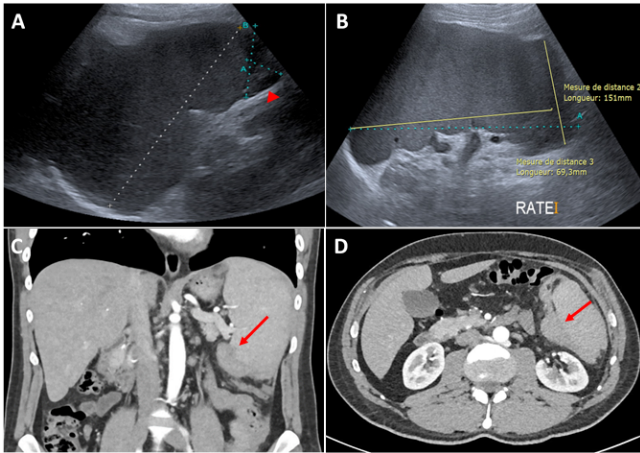
## Discussion

Recently, there has been no in-depth study of the characteristics of mononucleosis (MI)-associated splenic rupture and infarction. Although these complications are rare, they remain elusive, and the data reported in the literature are sketchy; mostly cases or series of case reports [6].

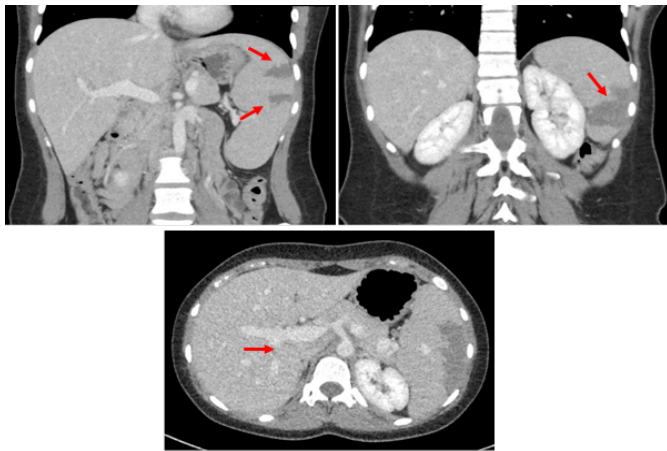
According to the literature, rupture and infarction mainly arise in men, generally aged between 15 and 30, and manifest themselves one to three weeks after the onset of symptoms of MI as acute, diffuse abdominal pain, more often localized in the left upper quadrant, and pain in the left shoulder (referred pain known as “Kehr’s sign”) as our first reported case [6,7]. Moreover, Patients may sometimes experience haemodynamic complications secondary to splenic rupture or haemorrhage in 1/3 of cases, which fortunately did not occur in our 2 patients [8].

While rare, splenic infarction and haemorrhage are generally associated with conditions that lead to embolic events, vasculitis, or direct trauma to the spleen [9]. Infectogenic causes are scarce and reported viral aetiologies include cytomegalovirus (CMV), parvovirus B19, adenovirus, and COVID-19. However, Epstein-Barr virus (EBV) is rarely associated with those complications [9,10]. In addition, some reported cases of splenic infarction quite frequently present with a pre-existing haematological pathology such as spherocytosis or sickle cell trait, a condition that may predispose to these severe infectious mononucleosis-related complications [6].

Given the rarity of these complications associated with MI, there is no clear consensus on treatment strategy. The non-operative management of hemodynamically stable cases is nowadays the standard of care [11]. In certain circumstances, anticoagulation is used in cases of splenic infarction, in view of the suspected pro-thrombotic background (but data are lacking), or renal artery embolization. Partial splenectomy and splenic repair are not currently recommended [12].



**Figure 1:** Abdominal ultrasound (A, B) showing hepatosplenomegaly and the presence of free peri-splenic fluid collected opposite the lower pole of the spleen (red head arrow). Additional imaging by abdominal CT scan (Figure C and D) was quickly performed to clarify the nature of the fluid and its significance, and confirmed the hepatosplenomegaly, demonstrating the presence of a peritoneal effusion with hyperdense peri-splenic fluid (2 cm) corresponding to blood and a fluid flow along the left paracolic gutter (red arrows).



**Figure 2:** Abdominal CT scan revealed splenomegaly with multiple splenic hypo densities of mixed topography, suggestive of areas of splenic infarction (red arrows).

## Conclusion

Splenic infarction and rupture are rare but potentially serious complications requiring appropriate multidisciplinary management. Splenic complications should be considered in patients with infectious mononucleosis who develop abdominal pain. Complementary laboratory tests and abdominal imaging

are essential for diagnosis, and management depends on the patient's clinical presentation and hemodynamic status. We would emphasize to our colleagues, particularly emergency physicians, that they should be well acquainted with the possibility of these complications, so as not to delay appropriate management.

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**Data Availability Statement:** The data used and analysed in this study are available from the corresponding author on reasonable request.

## References

- Gares V, Panico L, Castagne R, et al. (2017) The role of the early social environment on Epstein Barr virus infection: a prospective observational design using the Millennium Cohort Study. *Epidemiol Infect* 145:3405.
- Cohen JI. (2000) Epstein-Barr virus infection. *The New England journal of medicine* 343: 481–492.
- Dunmire SK, Verghese PS, Balfour HH Jr (2018) Primary Epstein-Barr virus infection. *J Clin Virol* 102:84–92.
- Vouloumanou EK, Rafailidis PI, Falagas ME. (2012) Current diagnosis and management of infectious mononucleosis. *Curr Opin Hematol*. 2012:14–20.
- Szokó M, Matolcsy A, Kovács G, Simon G. (2007) Tünetmentes mononucleosis infectiosa szövődményeként kialakult spontán lépruptúra [Spontaneous splenic rupture as a complication of symptom-free infectious mononucleosis]. *Orv Hetil*. 148:1381-4.
- Toti, J, Gatti B, Hunjan I, Kottanattu L, Faré P, et al (2023) Splenic rupture or infarction associated with Epstein-Barr virus infectious mononucleosis: a systematic literature review. *Swiss Medical Weekly*. 153: 40081.
- Renzulli P, Hostettler A, Schoepfer AM, Gloor B, Candinas D. (2009) Systematic review of atraumatic splenic rupture. *Br J Surg*. 2009:1114–21.
- Naviglio S, Abate MV, Chinello M, Ventura A. (2016) Splenic Infarction in Acute Infectious Mononucleosis. *J Emerg Med* 50:e11.
- Kalfoutzou A, Dimitrakoudi, M, Mylonakis A, & Kanellis T, & Mostratou, E (2023). Splenic Infarcts in an Adult Male with EBV Infection: A Rare Complication. *Oman Medical Journal*.
- Childers J, Do TV, Smith F, Vangara A, Ganti SS, Akella R. (2022) Incidental and Asymptomatic Splenic Infarction and Infrarenal Thrombus in a COVID-19 Patient. *Cureus*. 14: e26555.
- Williamson J. (2015) Splenic injury: diagnosis and management. *Br J Hosp Med (Lond)*. 2015:204–6.
- Ko A, Radding S, Feliciano DV, DuBose JJ, Kozar RA, et al. (2022) Near disappearance of splenorrhaphy as an operative strategy for splenic preservation after trauma. *Am Surg*. 2022:429–33.