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Splenic rupture as a rare complication of infectious mononucleosis – case report

Katarzyna Błaszczyszyn[1], Maciej Orzechowski[2], Aleksander Wójtowicz[3], Janusz Orzechowski[4]

[1]Jan Mikulicz – Radecki University Hospital in Wroclaw , Borowska 213 , 50-556 Wrocław | kb.blaszczyszyn@gmail.com
ORCID : 0009-0009-6529-8040

[2] The Voivodeship Specialist Hospital in Wroclaw, Kamieńskiego 73A, 51-124 Wrocław | maciek.orzech1@gmail.com
ORCID: 0009-0005-0195- 8805

[3] St Hedwig of Silesia Hospital , Prusicka 53-55 , 55-100 Trzebnica | aleksander.wojtowicz@onet.eu
ORCID: 0009-0002-3012-9879

[4] St Hedwig of Silesia Hospital , Prusicka 53-55 , 55-100 Trzebnica | jorzechowski@wp.pl
ORCID: 0009-0009- 3030-763X

Abstract

Infectious mononucleosis, caused by the Epstein-Barr virus, is a contagious disease primarily transmitted through bodily fluids, such as saliva. It is characterized by flu-like prodromal symptoms, followed by the tonsils enlargement, lymphadenopathy, and hepatosplenomegaly. Complications although rare, may include thrombocytopenia, anemia, encephalitis, myocarditis, or pancreatitis. One of the most dangerous is splenic rupture, which occurs in 0.1% to 0.5% of patients diagnosed with infectious mononucleosis.

We present the case of an 18-year-old patient, admitted to the general surgery department with acute abdominal pain, later diagnosed with Epstein-Barr virus-related splenic rupture unrelated to any trauma. The subsequent laboratory tests revealed leukocytosis, anemia, and abnormal liver function. Imaging revealed free fluid and an enlarged spleen, prompting laparoscopy, later converted to laparotomy due to surgical complexities. Splenectomy was performed, resulting in clinical improvement. Following effective treatment and implemented interventions, the patient was discharged after 7 days with specific postoperative instructions.

Keywords: mononucleosis; splenic rupture; EBV; infection; splenomegaly

Case Description

Due to acute abdominal symptoms, anemia and being in shock, an 18-year-old patient was admitted to the surgical ward late in the night on an emergency basis. Symptoms included severe abdominal pain, dizziness, fainting, and low blood pressure. Examination revealed increased tension and tenderness across the abdominal wall, with marked muscle guarding. The patient denied any history of trauma, but reported an ongoing upper respiratory tract infection for the past few days. Laboratory investigations revealed predominantly leukocytosis, anemia, elevated inflammatory markers, and elevated liver function tests [Tab. 1.]. The FAST ultrasound revealed the presence of free fluid in the peritoneal cavity. In the abdominal X-ray, shallow horizontal fluid levels were also observed on the right side of the abdominal cavity. In the left upper quadrant and mid-abdomen, a shadow was noted, displacing the intestines towards the right side, suggesting an enlarged spleen [Fig. 1]. Considering the severe condition of the patient, based on symptoms of hypovolemic shock and FAST examination findings, a decision to proceed with a surgical intervention was made. Laparoscopy revealed extensive intraperitoneal blood accumulation and a capsular spleen rupture with a massive subcapsular hematoma [Fig. 2]. Due to the challenging surgical conditions, the conversion to laparotomy was performed and the spleen was excised. Following hemostasis, a thorough inspection of the remaining abdominal organs revealed no other sources of bleeding.

During further hospitalization, the patient received transfusions of 3 units of packed red blood cells and 1 unit of fresh frozen plasma to treat anemia. Upon conducting a more detailed medical history, it was revealed that the patient had upper respiratory tract infection symptoms with tonsilitis, two days prior to admission to the hospital. During hospitalization, the patient was administered amoxicillin., followed by the appearance of a typical for mononucleosis rash within a few hours [Fig. 3] [1]. Given the previously diagnosed upper respiratory tract infection, typical rash after the administration of amoxicillin, and the suspected causal relationship with splenomegaly, MONO rapid test cassette detecting IM heterophile antibodies qualitatively in human blood was conducted, confirming the presence of infectious mononucleosis. After a seven-day hospitalization, the patient was discharged

home with standard surgical recommendations. These included daily care of surgical wounds, removing sutures after 12 days and medication use – analgesics as needed and antithrombotics for 10 days. Additionally, the patient was advised to follow a light diet for 2 weeks, wear an abdominal hernia prevention belt during usual physical activity for 8 weeks (removing it at night), avoid physical activity for 8 weeks, and get vaccinations against meningococcus, pneumococcus, and Haemophilus influenzae type B. Furthermore, it was recommended to undergo a complete blood count and upper respiratory tract examination in 7 days.

Examination	Results	Deviation
WBC	17.10 x 10^3/µl	H
RBC	3.15 x 10^6/µl	N
HGB	9.5 g/dl	L
HCT	27.6 %	L
NEUT	7.47 x 10^3/µl	H
LYMPH	7.24 x 10^3/µl	H
MONO	1.95 x 10^3/µl	H
BASO	0.32 x 10^3/µl	H
PLT	272 x 10^3/µl	N
CRP	26.04 mg/l	H
K+	4.18 mmol/l	N
Na+	122 mmol/l	L
CRT	2.99 mg/dl	H
UREA	69 mg/dl	H
ASPAT	44.93 U/l	H
ALAT	65.48 U/l	H

Tab. 1. Laboratory test results.

Fig. 1. Abdominal X-ray.

Fig. 2. Photograph of a laparoscopic subcapsular splenic hematoma.

Fig. 3. Rash after amoxicillin treatment.

Discussion

Described case report highlights splenic rupture as a rare but serious complication of infectious mononucleosis. Patients should be cautioned about the symptoms of splenic rupture to ensure prompt medical attention and minimize treatment delays. The presentation of acute abdominal pain, confusion, and hypotension underscores the need to consider this complication, especially with recent upper respiratory tract infection. Prompt diagnosis and intervention are crucial to prevent potentially life-threatening outcomes. In this case, splenectomy was necessary, a procedure that may lead to complications such as overwhelming post-splenectomy infection (OPSI), higher susceptibility to infections, especially from encapsulated bacteria, pancreatitis, and vascular and arterial complications,

including stroke or myocardial infarction. Additionally, asplenic patients are at higher risk of developing pulmonary hypertension and cancers, particularly in the head and neck, digestive tract, and hematological systems [2, 3]. Potential complications of infectious mononucleosis include acute interstitial nephritis, hemolytic anemia, splenic rupture, splenomegaly, encephalitis, myocarditis, and thrombocytopenia [4]. Spontaneous splenic rupture, the most feared and critical complication, occurs in 0.1 to 0.5% of cases, and poses a life-threatening risk [5]. Splenomegaly occurs in approximately 50% of patients and hemodynamic instability from circulatory shock happens in about one-third of splenic rupture cases and remains potentially fatal [5, 6]. Spontaneous splenic rupture can be triggered by the expansion of a subcapsular hematoma, ultimately causing the capsule to tear. This can occur in response to a Valsalva maneuver, such as during coughing, sneezing, or vomiting, which increases venous portal pressure, or exert compression on the spleen, contributing to the rupture [7].

Furthermore, this report emphasizes the importance of postoperative care, vaccination, and patient education as they are essential for optimal recovery and to prevent complications. Avoiding sports for 8 weeks after the onset of mononucleosis helps reduce the risk of spleen rupture. Excessive activity during the first weeks of this disease can prolong symptoms and make them more severe. The spleen is crucial in the immune system, removing senescent and damaged red blood cells and pathogens. After splenectomy, individuals demonstrate decreased IgM levels, reduced antibody production against pneumococci and Escherichia coli, and impaired cellular immune function [8]. Consequently, the weakened immune system shortly after surgery increases infection risk, especially during intense physical activity, which may also exacerbate the risk of internal injuries and severe bleeding. Before resuming rigorous activity confirmation of normal spleen size (if not removed) or proper healing and absence of complications through ultrasound, physical examination, and blood tests is essential. This careful approach ensures patient safety and promotes full recovery.

In conclusion, splenic rupture should be considered in the differential diagnosis of acute abdominal pain in patients, even when trauma is not evident. Early recognition and prompt intervention, including the use of imaging studies and timely surgical management, are critical for reducing mortality associated with splenic rupture. Comprehensive postoperative care and patient education are crucial for proper recovery and complication prevention.

DISCLOSURE

Author`s contribution:

Conceptualization: KB; methodology: MO; check: AW; formal analysis: JO; investigation: KB, AW ; resources: MO, JO ; data curation: JO, AW; writing - rough preparation: KB, MO; writing - review and editing: MO, KB, AW, JO; visualization: AW; supervision: JO, KB, AW, MO; project administration: KB, MO, JO

All authors have read and agreed with the published version of the manuscript.

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Institutional Review Board Statement

According to our ethics review board, ethics approval is not necessary for a case report; therefore, ethical approval is not required for this case report in accordance with local guidelines. All procedures performed in this study were in accordance with the ethical standards of the Institutional and/or National Research Committee(s) and with the Helsinki Declaration. Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Informed Consent Statement

Informed consent was obtained for the patient photos and information used in the paper.

Data Availability Statement

All the data generated or analyzed during this case report are included in this article. Further inquiries can be directed to the corresponding author.

Acknowledgments

Not applicable.

Conflicts of Interest

The authors declare no conflict of interest.

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