https://africanjournalofbiomedicalresearch.com/index.php/AJBR
Afr. J. Biomed. Res. Vol. 28(2s) (February 2025); 545-553
Research Article

Severe Post-Splenectomy Reactive Thrombocytosis with Active Bleeding: A Case Report

I Gede Eka Handrean[1*], Ni Made Putri Suastari[1], I Putu Pradiva Satriya Kirana[2]

[1]Medical Education Program, Faculty of Medicine, Universitas Mahasaraswati Denpasar
[2]Medical Student, Faculty of Medicine, Universitas Mahasaraswati Denpasar

***Correspondent Authors:** I Gede Eka Handrean.
*Medical Education Program, Faculty of Medicine, Universitas Mahasaraswati Denpasar.
Email: handrean@unmas.ac.id

Abstract
Background. Post-splenectomy reactive thrombocytosis is a well-documented complication, but its management becomes particularly challenging when complicated by active bleeding. This case presents a unique therapeutic dilemma where conventional platelet-lowering interventions were contraindicated due to ongoing hemorrhage, necessitating a carefully balanced management approach.
Case Presentation. A 30-year-old female presented with blunt abdominal trauma following a motorcycle accident, requiring emergency splenectomy for splenic rupture. Post-operatively, she developed severe reactive thrombocytosis with platelet counts reaching 945,000/μL by day 14, complicated by active bleeding manifesting as hematuria. The patient also sustained multiple injuries including left kidney trauma, rib fractures, and vertebral fractures, adding complexity to the management approach.
Management and Outcomes. Conservative management was adopted, prioritizing hemorrhage control over immediate platelet reduction. Serial monitoring demonstrated a gradual decline in platelet counts from 945,000/μL to 535,000/μL over one week without pharmacological intervention. Blood smear analysis confirmed reactive thrombocytosis, effectively ruling out myeloproliferative disorders. The patient remained stable throughout the observation period without developing thrombotic complications.
Conclusions. This case demonstrates that severe post-splenectomy thrombocytosis can be successfully managed conservatively in the presence of active bleeding through careful monitoring and individualized risk assessment. The natural resolution of thrombocytosis without pharmacological intervention suggests that aggressive platelet reduction may not always be necessary when close surveillance is maintained.

Key words: Post-splenectomy thrombocytosis, blunt abdominal trauma, reactive thrombocytosis, conservative management

***Authors for correspondence: E-mail Id:** handrean@unmas.ac.id*

Received 15/01/2025 Acceptance 03/02/2025

DOI: https://doi.org/10.53555/AJBR.v28i2S.6660

© 2025 The Author(s).
This article has been published under the terms of Creative Commons Attribution-Non-commercial 4.0 International License (CC BY-NC 4.0), which permits non-commercial unrestricted use, distribution, and reproduction in any medium, provided that the following statement is provided. "This article has been published in the African Journal of Biomedical Research"

Introductions

Blunt abdominal trauma represents a critical challenge in emergency medicine, contributing significantly to global morbidity and mortality rates in trauma cases (Ahmed et al., 2019; Shah et al., 2022). The demographic pattern shows a predominant occurrence in

young adult males between 20-30 years of age, highlighting its impact on a productive segment of the population(Ahmed et al., 2019; Krishnappa et al., 2017). Statistical evidence indicates that blunt trauma accounts for approximately 80% of abdominal injuries presenting to emergency departments, with specific injury patterns including duodenal involvement in 1-4% of cases (Shah et al., 2022; Zelić et al., 2010).

The management of blunt abdominal trauma often necessitates emergency splenectomy, particularly in cases of severe splenic rupture. This surgical intervention, while life-saving, introduces a cascade of physiological adaptations, most notably reactive thrombocytosis (Ejikeme et al., 2021; Ünver et al., 2015). The post-splenectomy period is characterized by a predictable pattern of platelet elevation, typically reaching peak levels within 1-3 weeks following the procedure, followed by a gradual normalization process (Ünver et al., 2015). This phenomenon is directly attributed to the spleen's fundamental role in platelet homeostasis, specifically in regulating platelet clearance from circulation (Ejikeme et al., 2021; Ünver et al., 2015).

Post-splenectomy complications present a spectrum of clinical challenges, with particular emphasis on hematological and vascular sequelae. In the United States alone, annual statistics reveal approximately 16,500 cases of reactive thrombocytosis and 1,100 cases of thrombosis following splenectomy (Ejikeme et al., 2021). These complications necessitate vigilant monitoring and targeted management strategies to prevent adverse outcomes.

The therapeutic approach to post-splenectomy thrombocytosis demands a comprehensive understanding of its underlying pathophysiology (Sarbay & Akbayram, 2019). Management strategies are primarily guided by the etiology of thrombocytosis, with different approaches required for cases complicated by infection, anemia, or inflammatory conditions. While thrombocytosis associated with these conditions typically resolves with treatment of the primary cause, post-splenectomy thrombocytosis often demonstrates greater resistance to conventional management approaches. This resistance necessitates more intensive monitoring protocols and may require pharmacological intervention, such as hydroxyurea, particularly in cases where platelet counts remain persistently elevated (Sarbay & Akbayram, 2019).

Case Presentation

A 30-year-old female with no significant past medical history presented to the emergency department on March 17, 2024, following a motorcycle accident. Her primary complaints included severe left flank and back pain with breathing difficulty. She maintained consciousness throughout and denied any visual disturbances or neurological symptoms.

Diagnostic Assessment and Surgical Intervention

Urgent CT imaging revealed high-grade splenic and left kidney injury with hemoperitoneum, accompanied by thoracic injuries including mild left pneumothorax and multiple rib fractures. Following rapid assessment by a multidisciplinary team, the patient underwent emergency laparotomy with splenectomy and left kidney repair. Chest tube placement was performed concurrently to manage the pneumothorax. Intraoperative blood loss necessitated transfusion of 4 units packed red cells and 5 units fresh frozen plasma.

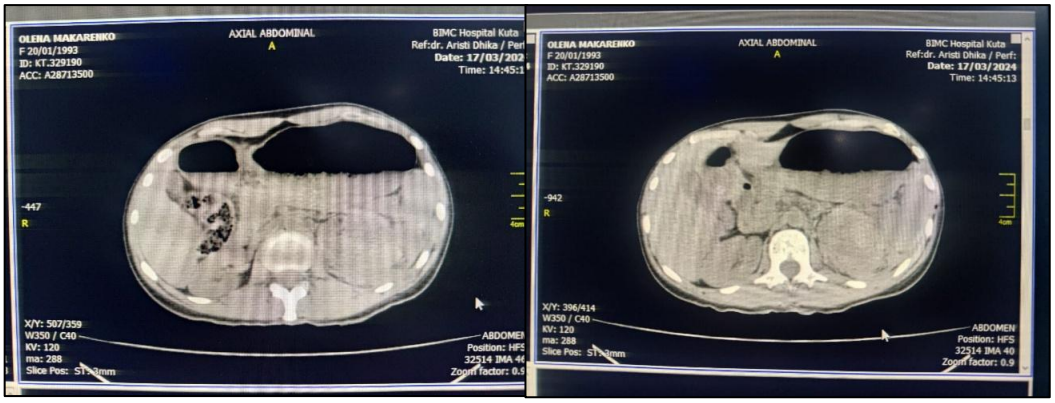

Figure 1 Abdominal CT-Scan

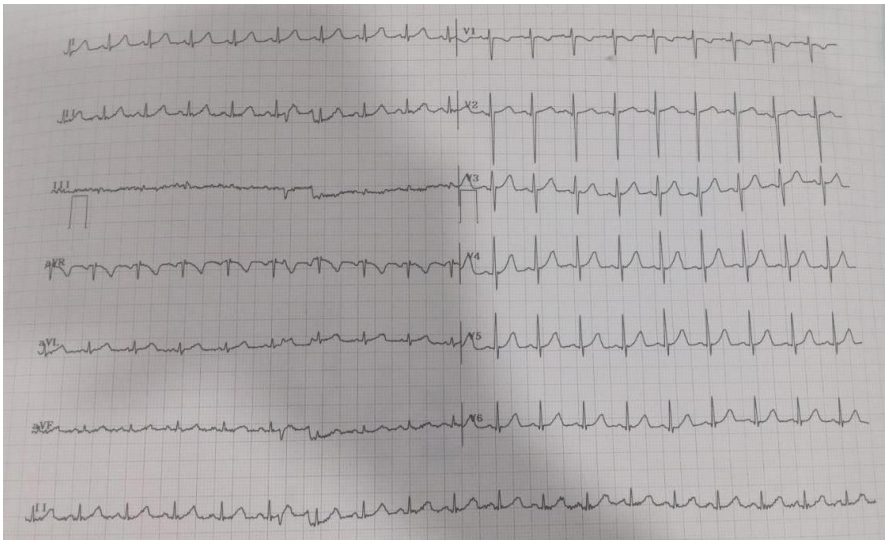

Figure 2 ECG

On March 29, 2024, a blood smear examination revealed several significant findings. The erythrocyte analysis showed normocromic normositer characteristics, with poikilocytosis indicated by the presence of ovalocytes and polychromasia. Importantly, no nucleated red blood cells (NRBC) were detected. The leukocyte count appeared elevated, with a differential count demonstrating neutrophilia and the presence of immature granulocytes. Notably, there was no evidence of vacuolization, toxic granules, or blasts. The platelet analysis indicated an increased platelet count, with the presence of giant platelets and no platelet clumps observed. The overall conclusion from the examination was that the patient exhibited normocromic anemia accompanied by leukocytosis and thrombocytosis, with a differential diagnosis pointing towards reactive thrombocytosis. Additionally, the procalcitonin level was measured at 0.11 ng/mL, suggesting a low likelihood of bacterial infection.

Tabel 1. Complete Blood Count

Parameter	**20-03-2024**	**21-03-2024**	**22-03-2024**	**29-03-2024**	**30-03-2024**	**31-03-2024**	**02-04-2024**	**05-04-2024**	**08-04-2024**	**Reference Value**	**Unit**
Hemoglobin	9.4	10.0	10.3	9.62	9.46	10.61	11.07	11.07	11.27	12-16	g/dL
Hematocrit	28.5	30.0	30.8	28.6	27.8	31.6	33.7	33.7	34.4	36-46	%
Erythrocytes	2.94	3.43	3.37	3.08	2.99	3.54	3.76	3.76	3.81	4-5.2	10^6/uL
MCV	88.2	90.1	91.4	92.8	93.0	89.3	89.7	89.7	90.4	80-100	fL
MCH	28.6	29.2	29.4	31.2	31.6	30.0	29.4	29.4	29.6	26-34	pg
MCHC	32.4	32.4	32.6	33.6	34.0	33.6	32.8	32.8	32.8	31-36	g/dL
RDW	14.4	14.3	14.2	15.2	15.2	17.2	17.2	17.2	17.6	11.6-14.8	%
RDW-CV	13.3	13.3	13.3	-	-	-	-	-	-	11.0-16.0	%
Leukocytes	8.9	11.1	13.6	16.50	17.59	20.77	18.11	18.11	15.41	4.1-11	10^3/uL
Neutrophils (%)	74.0	88.0	80.4	72.87	79.91	80.68	78.63	78.63	76.63	47-80	%
Lymphocytes (%)	19.0	7.3	10.0	13.87	9.92	10.21	13.84	13.84	15.34	13-40	%
Monocytes (%)	6.0	4.6	4.8	9.45	7.80	6.56	6.47	6.47	6.60	2-11	%
Eosinophils (%)	0.0	0.1	1.8	3.63	2.19	2.38	0.83	0.83	0.89	0-5	%
Basophils (%)	0.0	0.0	0.0	0.18	0.18	0.16	0.23	0.23	0.53	0.05-0.47	%
Platelets	196	192	294	886	788	945	704	704	535	150-450	10^3/mm^3
MPV	10.8	10.7	11.2	8.38	8.71	8.23	8.78	8.78	9.16	6.8-10	fL

Tabel 2. Abdominal CT scan & Thorax X-ray

Date	**Procedure**	**Finding**
17/03/2024	CT Whole ABD Non-CNTRS	- High grade spleen and left kidney injury. - Hemoperitoneum at perisplenic space and left paracolic gutter. - Lung contusion at lateral segment of left lower lobe.

Tabel 2. Abdominal CT scan & Thorax X-ray

Date	Procedure	Finding
		- Displaced fracture at lateral aspect of 7th, 9th left ribs with adjacent subcutaneous emphysema. - Incomplete fracture at lateral aspect of 10th left rib.
18/03/2024	X-ray Thorax AP/PA	- Lungs: No infiltrates/nodule - Mediastinum: Normal - Trachea and Bronchus: Normal - Pulmonary Hilum: Normal - Pleura: Normal - Diaphragm: Normal - Heart: Normal - Aorta: Normal - Thoracic Spine: Normal - Other visualized bones: Displaced fractures at lateral aspect of 7th and 9th left ribs - Visualized soft tissues: Normal - Other: ET tube in situ, distal tip projected at level C6, Right Subclavian CVC insertion, distal tip projected at caval-atrial junction, Left chest tube insertion, distal tip projected at left ICS IV, posteriorly

Early Post-operative Course (Days 1-5), the patient was managed in the ICU with comprehensive post-operative care that included mechanical ventilation with planned weaning, intravenous analgesia using paracetamol and regulated opioids, broad-spectrum prophylactic antibiotics, early chest physiotherapy, and careful fluid management. Initial laboratory values indicated an appropriate response to treatment, with platelet counts recorded at 196,000/µL and hemoglobin at 9.4 g/dL by post-operative day 3.

Development of Complications (Days 6-10), by post-operative day 10, two significant developments were noted. The patient experienced the onset of hematuria, which was confirmed by urinalysis showing proteinuria at +3, occult blood at +4, and active bleeding in the urinary sediment. Additionally, there was an emerging thrombocytosis characterized by a rapid elevation in platelet counts.

Management of Thrombocytosis (Days 11-22), serial monitoring during this period revealed progressive thrombocytosis. On day 12, the platelet count was recorded at 886,000/µL, which peaked at 945,000/µL by day 14. Subsequently, the platelet count began to decline, reaching 704,000/µL by day 16 and further reducing to 535,000/µL by day 22. This monitoring was crucial in managing the patient's condition, particularly in the context of her active bleeding and the need for careful therapeutic intervention.

Tabel 3: Routine Urine

Parameter	Result	Reference	Unit
Color	Reddish Yellow	Yellow	-
Turbidity	Turbid	Clear	-
Specific Gravity (SG)	1.010	1.000 – 1.030	-
pH	7.0	4.5 – 8.0	-
Leukocyte Esterase	Positive(+1)	Negative	-
Protein	Positive(+3)	Negative	-
Glucose	Negative	Negative	-
Ketone	Negative	Negative	-
Urobilinogen	Normal	Normal	-
Bilirubin	Negative	Negative	-
Occult Blood	Positive(+4)	Negative	-
Sediment			
- Erythrocyte	Many	0 – 5	/hpf
- Leukocyte	8-10	0 – 5	/hpf
- Cylinder	Negative	Negative	-
- Epithelial Cell	Squamous	0-1	/lpf
- Crystal	Negative	Negative	-
- Bacteria	Negative	Negative	-
- Others	Negative	-	-

The concurrent presence of active bleeding and severe thrombocytosis presented a unique management challenge for the clinical team. Blood smear analysis confirmed reactive thrombocytosis characterized by giant platelets, effectively ruling out myeloproliferative disorders, with procalcitonin levels at 0.11 ng/mL.

Given the active bleeding, conventional platelet-lowering interventions were contraindicated, necessitating a modified therapeutic approach. The conservative management strategy involved withholding antiplatelet and cytoreductive therapy, implementing an enhanced monitoring protocol, and conducting regular clinical assessments for thrombotic complications.

The monitoring protocol included twice-daily platelet counts during peak thrombocytosis, daily complete blood counts and coagulation profiles, regular assessments of kidney and liver function, and continuous clinical surveillance for complications. This conservative management approach proved effective, as evidenced by gradual normalization of platelet counts, no development of thrombotic complications, stabilization of bleeding parameters, and overall improvement in the patient's clinical status.

The patient's recovery was further supported by comprehensive rehabilitation, which included early mobilization and physical therapy. Upon discharge, she was provided with a structured follow-up plan that incorporated regular outpatient platelet monitoring, wound care follow-up, a rehabilitation program for multiple trauma recovery, and scheduled clinical assessments for potential delayed complications.

Throughout her treatment, the patient expressed significant concern regarding her complex medical condition, particularly about the severe thrombocytosis that developed post-splenectomy. Initially, she showed anxiety about the frequent blood sampling required for monitoring; however, she demonstrated a good understanding of its necessity after a thorough explanation of the management plan. When discussing the conservative approach chosen due to her active bleeding, she expressed relief that medications which might increase bleeding risk could be avoided.

The patient's compliance with the intensive monitoring protocol was excellent, and she maintained a positive attitude despite her prolonged hospital stay. She particularly appreciated the regular updates about her platelet count trends, noting that watching the numbers gradually decrease helped alleviate her concerns about potential complications. During follow-up discussions, she acknowledged that while the conservative management approach required patience, she felt confident in the team's decision-making process and was satisfied with the gradual improvement in her condition. Her active engagement in her care plan and willingness to participate in regular monitoring significantly contributed to the successful implementation of the conservative management strategy. This experience provides valuable insight into the psychological aspects of managing complex post-operative complications and highlights the importance of clear communication in maintaining patient cooperation during prolonged observation periods.

Discussion

Pathophysiology of Post-Splenectomy Thrombocytosis

The development of severe reactive thrombocytosis following emergency splenectomy represents a well-documented pathophysiological process characterized by multiple interacting mechanisms (Arora & Arora, 2023; Monga et al., 2017). The primary driver of this condition stems from the fundamental disruption of platelet clearance following splenic removal. The spleen, serving as the principal site for platelet sequestration and destruction, plays a crucial role in maintaining platelet homeostasis. Its removal leads to a significant reduction in platelet turnover, resulting in a marked elevation of circulating platelet counts that typically peaks within 1-3 weeks post-surgery (Kim et al., 2022; Monga et al., 2017).

A critical component in this pathophysiological cascade involves the dysregulation of thrombopoietin (TPO) dynamics. TPO, predominantly produced by the liver and kidneys, functions as the primary regulator of platelet production. Following splenectomy, the reduction in platelet clearance results in decreased TPO consumption. This leads to elevated circulating TPO levels, which in turn stimulates enhanced platelet production, creating a cycle that contributes to sustained thrombocytosis (Ejikeme et al., 2021; Kim et al., 2022).

The inflammatory response triggered by both the initial trauma and subsequent surgical intervention adds another layer of complexity to this process. Proinflammatory cytokines, particularly interleukin-6 (IL-6) and interleukin-1 (IL-1), play significant roles in this cascade. These cytokines not only stimulate additional TPO production but also directly promote megakaryocyte differentiation and platelet release, further contributing to the elevated platelet counts (Arora & Arora, 2023; Monga et al., 2017).

The natural history of post-splenectomy thrombocytosis follows a characteristic pattern, beginning with a rapid rise in platelet counts that typically peaks within 1-3 weeks after the procedure. While these elevated levels may persist for several weeks to months, they generally return to normal as the body adapts to the absence of splenic function (Arora & Arora, 2023; Monga et al., 2017; Zaja et al., 2016). However, some cases demonstrate resistance to normalization or prolonged elevation, necessitating careful monitoring and potential therapeutic intervention (Kim et al., 2022; Zimmerman et al., 2016).

Understanding this complex pathophysiological cascade is crucial for clinicians, as it informs both monitoring strategies and therapeutic interventions. The interplay between platelet clearance disruption, TPO dysregulation, and inflammatory responses creates a dynamic process that requires careful clinical attention and individualized management approaches to prevent potential complications and optimize patient outcomes.

Review of Published Literature

A notable case report by Arora and Arora described a patient who experienced significant reactive thrombocytosis post-splenectomy, with platelet counts reaching 1.2 million/μL. Their report emphasized the critical importance of vigilant monitoring and highlighted the potential necessity of interventions including antiplatelet agents and hydroxyurea in managing this condition (Arora & Arora, 2023).

The potential severity of complications associated with post-splenectomy thrombocytosis was starkly illustrated in a case reported by Monga et al. (2017), where a patient developed fatal pulmonary embolism following splenectomy for blunt abdominal trauma. This tragic outcome underscored the crucial need for prophylactic anticoagulation and meticulous monitoring in post-splenectomy patients, particularly those developing thrombocytosis.

When analyzing management approaches across the literature, a comprehensive strategy emerges as the standard of care. This includes regular monitoring of platelet counts and, when indicated, the implementation of antiplatelet therapy or cytoreductive medications such as hydroxyurea (Arora & Arora, 2023). The consideration of prophylactic anticoagulation has also been emphasized as a crucial preventive measure against thrombotic complications (Monga et al., 2017). The literature particularly stresses the importance of identifying the underlying cause of thrombocytosis, as this fundamentally influences treatment decisions and outcomes (Arora & Arora, 2023).

A distinctive characteristic of post-splenectomy thrombocytosis, compared to thrombocytosis arising from other causes such as infection or inflammation, is its potential resistance to conventional treatment approaches (Arora & Arora, 2023). This resistance necessitates a more aggressive monitoring protocol and may require more intensive therapeutic interventions. The temporal pattern of platelet count elevation, typically peaking within 1-3 weeks post-procedure, appears consistent across multiple case reports and aligns with the expected physiological response to splenectomy (Monga et al., 2017).

Management Challenges and Therapeutic Approaches

The management of severe reactive thrombocytosis following emergency splenectomy presents complex clinical challenges requiring careful consideration of multiple therapeutic options. A comprehensive risk-benefit analysis is essential when considering intervention with antiplatelet agents or cytoreductive medications, such as hydroxyurea, which is typically initiated at 500-1000 mg daily and titrated based on response. This medication represents a primary pharmacological intervention in cases of severe thrombocytosis; however, clinicians must carefully weigh its potential benefits against risks such as myelosuppression and other adverse effects (Arora & Arora, 2023; Monga et al., 2017).

The implementation of a structured monitoring protocol forms the cornerstone of post-splenectomy care, involving daily platelet count monitoring in the immediate post-operative period, transitioning to every 2-3 days monitoring during weeks 1-3 post-surgery, and weekly monitoring thereafter until stabilization (Arora & Arora, 2023; Monga et al., 2017).

Prophylactic anticoagulation plays a crucial role in preventing thrombotic complications, with low-molecular-weight heparin (LMWH), typically enoxaparin 40 mg subcutaneously once daily, commonly employed as the first-line prophylactic agent. In cases of higher thrombotic risk, the dose may be increased to 40 mg twice daily based on individual risk assessment. For patients with contraindications to LMWH, alternative anticoagulation strategies may include unfractionated heparin (5000 units subcutaneously every 8-12 hours) or direct oral anticoagulants in specific cases (Monga et al., 2017). For severe cases where platelet counts exceed 1,000,000/μL, more aggressive interventions may be warranted, including aspirin (81-325 mg daily) when bleeding risk is acceptable, hydroxyurea (starting at 500-1000 mg daily, with dose adjustments based on response), or plateletpheresis in extreme cases or when rapid platelet reduction is necessary (Zimmerman et al., 2016).

Patient monitoring should extend beyond platelet counts to include regular assessment for signs of thrombotic complications, incorporating regular physical examinations focusing on signs of deep vein thrombosis, a low threshold for diagnostic imaging when thrombosis is suspected, monitoring of complete blood count to assess for other cytopenias if on cytoreductive therapy, and regular assessment of liver and kidney function in patients receiving hydroxyurea (Arora & Arora, 2023; Monga et al., 2017).

The literature emphasizes that post-splenectomy thrombocytosis often demonstrates greater resistance to conventional treatments compared to reactive thrombocytosis from other causes (Arora & Arora, 2023). This resistance may necessitate more aggressive therapeutic approaches and prolonged monitoring periods. The decision to initiate or adjust therapy should be individualized based on platelet count trends, clinical symptoms, and overall thrombotic risk assessment (Zimmerman et al., 2016).

Management Challenges in Post-Splenectomy Thrombocytosis with Active Bleeding

The management of severe reactive thrombocytosis (RT) following emergency splenectomy, especially in the context of active bleeding, poses a complex therapeutic challenge that necessitates careful consideration of both benefits and risks. When platelet counts exceed 1,000,000/μL, the risk of thrombotic complications escalates significantly, creating a delicate balance between thrombotic and hemorrhagic risks. Traditional therapeutic interventions, such as antiplatelet agents and cytoreductive medications, become particularly challenging in actively bleeding patients. Hydroxyurea, often used for persistent thrombocytosis, carries additional risks due to its myelosuppressive effects, which could potentially exacerbate bleeding complications. In such scenarios, alternative rapid platelet reduction strategies, such as plateletpheresis, may be more appropriate (Ejikeme et al., 2021; Ramalimgam, 2018).

A rigorous monitoring protocol is essential in these complex cases, incorporating daily assessments of platelet counts and hemoglobin levels, regular evaluations of bleeding parameters, close monitoring of hemodynamic status, and surveillance for signs of thrombotic complications (Arora & Arora, 2023; Ejikeme et al., 2021). This intensive monitoring facilitates early detection of complications and timely

interventions when necessary. The management strategy should follow a staged approach, beginning with an initial focus on hemorrhage control and hemodynamic stabilization, followed by the administration of blood products as needed, careful consideration of the timing for initiating antithrombotic therapy, and the implementation of cytoreductive therapy only after bleeding is controlled (Dumrongmongcolgul et al., 2013; Khanduri et al., 2021).

Once active bleeding is managed, preventive strategies become crucial. Prophylactic anticoagulation may be considered for patients who have achieved hemostasis, but the timing of initiation requires careful clinical judgment (Khanduri et al., 2021). The literature indicates that post-splenectomy thrombocytosis often demonstrates greater resistance to conventional treatments compared to reactive thrombocytosis from other causes, necessitating more intensive monitoring and potentially more aggressive interventions once bleeding is controlled. The complexity of managing concurrent thrombocytosis and active bleeding underscores the need for a coordinated approach involving hematologists, trauma surgeons, and critical care specialists (Arora & Arora, 2023). This multidisciplinary management ensures comprehensive care that addresses both immediate bleeding risks and the long-term complications associated with severe thrombocytosis (Alberio, 2016; Ramalimgam, 2018).

Classification and Therapeutic Thresholds of Thrombocytosis

Thrombocytosis can be classified based on platelet count levels, which helps guide management strategies. Mild thrombocytosis is defined as a platelet count between 500,000 and 700,000/μL, generally requiring only monitoring without specific intervention unless additional risk factors are present. Moderate thrombocytosis, with platelet counts ranging from 700,000 to 900,000/μL, necessitates close monitoring and may warrant the consideration of aspirin at a dose of 81 mg daily if there is no associated bleeding risk, along with regular assessments of thrombotic risk factors (Alberio, 2016; Ejikeme et al., 2021).

Severe thrombocytosis is characterized by platelet counts exceeding 900,000/μL, which significantly increases the risk of complications. In this case, aggressive monitoring is essential, and clinicians may consider initiating hydroxyurea at a starting dose of 500 mg daily, as well as aspirin at doses between 81 and 325 mg daily if there are no contraindications. Close monitoring for complications is critical during this stage (Ejikeme et al., 2021; Ramalimgam, 2018).

Extreme thrombocytosis, defined as platelet counts greater than 1,000,000/μL, requires immediate intervention. In such cases, hydroxyurea should be administered at doses ranging from 500 to 1,000 mg daily, and plateletpheresis may be considered in emergent situations. Additionally, anticoagulation therapy should be initiated if there is no active bleeding present. It is important to note that while these therapeutic intervention thresholds provide a framework for management, they may be modified based on individual risk factors and clinical circumstances, particularly in the context of active bleeding, where the risk of thrombotic complications is heightened (Alberio, 2016; Khanduri et al., 2021).

Special Considerations in Active Bleeding

In the context of active bleeding, the therapeutic thresholds for managing thrombocytosis must be adjusted to prioritize hemostasis over platelet-lowering interventions. Even in cases of severe thrombocytosis, where platelet counts exceed 900,000/μL, the primary focus should be on controlling the bleeding before initiating any treatment aimed at reducing platelet levels. The management approach should be tailored to the individual patient, taking into account several critical factors, including the severity of the bleeding, the location of the hemorrhage, the patient's hemodynamic stability, and their overall clinical condition (Dumrongmongcolgul et al., 2013; Ramalimgam, 2018).

A monitoring protocol based on the severity of thrombocytosis is essential for effective management. For mild thrombocytosis, defined as platelet counts between 500,000 and 700,000/μL, platelet counts should be monitored every 2-3 days, with a basic coagulation profile assessed weekly. In cases of moderate thrombocytosis (700,000-900,000/μL), daily platelet counts and coagulation profiles should be conducted twice weekly, along with regular clinical assessments for any complications. For severe or extreme thrombocytosis, where platelet counts exceed 900,000/μL, it is crucial to monitor platelet counts twice daily, perform a comprehensive coagulation profile daily, and maintain continuous surveillance for both thrombotic and hemorrhagic complications (Arora & Arora, 2023; Ejikeme et al., 2021).

When managing active bleeding, specific treatment modifications are necessary. Antiplatelet therapy should be delayed until hemostasis is achieved, and plateletpheresis may be considered for rapid platelet reduction when counts exceed 1,000,000/μL. In high-risk patients, the target platelet count should be less than 600,000/μL, while stable patients should aim to maintain platelet counts below 800,000/μL. This stratified approach to management, which considers both platelet count thresholds and clinical presentation, facilitates more precise and appropriate therapeutic interventions while minimizing risks associated with active bleeding (Boddu et al., 2017; Ejikeme et al., 2021).

This case demonstrates remarkable congruence with established literature regarding the pathophysiological progression and management of post-splenectomy thrombocytosis. The temporal development of thrombocytosis in our patient closely aligned with the expected timeline described in current literature. The platelet count showed a characteristic pattern: initial normal levels (196,000/μL) at post-operative day 3, followed by a significant rise to 886,000/μL by day 12, reaching a peak of 945,000/μL on day 14, and subsequently showing a gradual decline to 535,000/μL by day 22. This pattern perfectly mirrors the documented 1–3-week peak period for post-splenectomy thrombocytosis (Arora & Arora, 2023; Monga et al., 2017).

The severity classification of thrombocytosis in our patient, which reached the 'severe' category with counts of 945,000/μL, aligns with established thresholds in the literature (Alberio, 2016; Ejikeme et al., 2021). This case particularly highlights the complex management considerations in severe thrombocytosis complicated by active bleeding. The patient's presentation was further complicated by multiple trauma involving thoracic, abdominal, and vertebral injuries, which likely contributed to an enhanced inflammatory response, consistent with the documented role of inflammatory mediators in post-splenectomy thrombocytosis (Arora & Arora, 2023; Monga et al., 2017).

The management approach adopted in this case closely followed evidence-based guidelines while adapting to the patient's specific circumstances. The decision to withhold antiplatelet therapy due to active bleeding (manifesting as hematuria) exemplifies the careful risk-benefit assessment described in the literature (Alberio, 2016; Ramalimgam, 2018). The monitoring protocol implemented, including serial complete blood counts, organ function evaluation, and blood smear analysis, reflects the intensive surveillance recommended for severe cases (Arora & Arora, 2023; Ejikeme et al., 2021).

The patient's response to conservative management was particularly noteworthy. The gradual decline in platelet counts from 945,000/μL to 535,000/μL over approximately one week demonstrates the natural course of post-splenectomy thrombocytosis when appropriately monitored. This outcome supports literature findings that some cases can be successfully managed without aggressive intervention, even in the severe category, provided there is close monitoring and no evidence of thrombotic complications (Monga et al., 2017).

The case was further validated by the blood smear findings, which confirmed reactive thrombocytosis and effectively ruled out other potential causes such as myeloproliferative disorders. This diagnostic approach aligns with recommended protocols for differentiating post-splenectomy thrombocytosis from other etiologies (Alberio, 2016; Khanduri et al., 2021).

Conclusions

This case provides valuable insights into the complex management of severe post-splenectomy thrombocytosis complicated by active bleeding. The successful outcome supports several key scientific principles in the management of this challenging clinical scenario.

First, the natural history of post-splenectomy thrombocytosis observed in this case aligns with the established pathophysiological mechanisms. The gradual rise and subsequent spontaneous decline in platelet count follow the expected pattern of temporary disruption in platelet homeostasis following splenic removal. This temporal progression validates the theoretical framework of post-splenectomy adaptation and supports the potential for spontaneous resolution in carefully monitored cases.

Second, the case demonstrates that the presence of active bleeding does not necessarily mandate aggressive pharmacological intervention for severe thrombocytosis. The successful conservative management approach challenges the traditional paradigm of routine antiplatelet or cytoreductive therapy for all cases of severe thrombocytosis. Instead, it suggests that individualized risk stratification and careful monitoring may be appropriate in selected cases.

Third, this case establishes the importance of comprehensive monitoring protocols in guiding management decisions. The serial laboratory data, including complete blood counts, blood smear analysis, and inflammatory markers, provided crucial information for real-time decision-making and validated the conservative approach through documented platelet count normalization.

Acknowledgments

We would like to thank all the participants who were willing to support this study.

Funding

This study did not receive any funding in any form.

Conflict of interest

The authors declare that there is no conflict of interest.

References

1. Ahmed, M. H. S., Tamgadge, L. V., Gurav, P. D., Dalavi, S. B., Bankar, S., & Parmar, R. (2019). Blunt abdominal trauma: the experience in rural India and review of literature. *International Journal of Research in Medical Sciences*, *8*(1), 322. https://doi.org/10.18203/2320-6012.ijrms20195930
2. Alberio, L. (2016). Do we need antiplatelet therapy in thrombocytosis? Pro. *Hämostaseologie*, *36*(04), 227–240. https://doi.org/10.5482/HAMO-14-11-0074
3. Arora, D., & Arora, N. (2023). Anaesthetic considerations in a case of post splenectomy reactive thrombocytosis. *Southeast Asian Journal of Health Professional*, *6*(2), 44–46. https://doi.org/10.18231/j.sajhp.2023.010
4. Boddu, P., Falchi, L., Hosing, C., Newberry, K., Bose, P., & Verstovsek, S. (2017). The role of thrombocytapheresis in the contemporary management of hyperthrombocytosis in myeloproliferative neoplasms: A case-based review. *Leukemia Research*, *58*, 14–22. https://doi.org/10.1016/j.leukres.2017.03.008
5. Dumrongmongcolgul, N., Mankongpaisarnrung, C., Sutamtewagul, G., Hosiriluck, N., Chen, T., Trujillo, A., Dcunha, N., Nugent, K., & Jenkins, L. A. (2013). Reactive Thrombocytosis Associated with Acute Myocardial Infarction following STEMI with Percutaneous Coronary Intervention. *Case Reports in Cardiology*, *2013*, 1–3. https://doi.org/10.1155/2013/707438
6. Ejikeme, C., Elkattawy, S., Kayode-Ajala, F., Ayad, S., Al-nasseri, A., & Kessler, W. (2021). Reactive Thrombocytosis after Splenectomy in Hereditary Spherocytosis: Case Report and Literature Review. *European Journal of Case*

Reports in Internal Medicine. https://doi.org/10.12890/2021_002673

7. Khanduri, A., Gupta, R., Gupta, J., & Ammar, H. (2021). Essential Thrombocythemia Due to Janus Kinase 2 Mutation Unmasked After Splenectomy. *Cureus*. https://doi.org/10.7759/cureus.15357
8. Kim, M.-S., Baek, S. H., Noh, J. J., Shim, J. I., Kang, J. H., Jeong, S. Y., Choi, C. H., Kim, T.-J., Lee, J.-W., & Lee, Y.-Y. (2022). Role of reactive thrombocytosis after primary cytoreductive surgery in advanced ovarian cancer. *Frontiers in Oncology*, *12*. https://doi.org/10.3389/fonc.2022.926878
9. Krishnappa, N., Khan, A., & Sakranaik, S. (2017). An analysis of injury patterns of abdominal trauma in patients attending surgical emergency department of rural hospital, Karnataka, India. *International Surgery Journal*, *4*(11), 3736. https://doi.org/10.18203/2349-2902.isj20174897
10. Monga, V., Maliske, S. M., & Perepu, U. (2017). Fatal pulmonary embolism following splenectomy in a patient with Evan's syndrome: case report and review of the literature. *Thrombosis Journal*, *15*(1), 18. https://doi.org/10.1186/s12959-017-0141-5
11. Ramalimgam, P. (2018). Postsplenectomy Thrombocytosis and Managements. *Open Access Journal of Surgery*, *8*(1). https://doi.org/10.19080/OAJS.2018.08.555728
12. Sarbay, H., & Akbayram, S. (2019). Secondary severe thrombocytosis in a patient who underwent splenectomy due to hereditary spherocytosis and its treatment using hydroxyurea. *Pan African Medical Journal*, *32*. https://doi.org/10.11604/pamj.2019.32.175.17841
13. Shah, D. K., Patel, K. M., Patel, S., Padshala, R., & Doliya, T. (2022). Efficacy of blunt abdominal trauma scoring system in management of blunt abdominal trauma. *International Surgery Journal*, *9*(10), 1726. https://doi.org/10.18203/2349-2902.isj20222597
14. Ünver, M., Öztürk, Ş., Erol, V., Cartı, E. B., Bozbıyık, O., Kebapçı, E., Ölmez, M., & Akbulut, G. (2015). Retroperitoneal paraganglioma presenting with pancytopenia: A rare case with rare manifestation. *International Journal of Surgery Case Reports*, *14*, 77–79. https://doi.org/10.1016/j.ijscr.2015.07.021
15. Zaja, F., Barcellini, W., Cantoni, S., Carpenedo, M., Caparrotti, G., Carrai, V., Di Renzo, N., Santoro, C., Di Nicola, M., Veneri, D., Simonetti, F., Liberati, A. M., Ferla, V., Paoloni, F., Crea, E., Volpetti, S., Tuniz, E., & Fanin, R. (2016). Thrombopoietin receptor agonists for preparing adult patients with immune thrombocytopenia to splenectomy: results of a retrospective, observational <scp>GIMEMA</scp> study. *American Journal of Hematology*, *91*(5). https://doi.org/10.1002/ajh.24341
16. Zelić, M., Kunišek, L., Petrošić, N., Mendrila, D., Depolo, A., & Uravić, M. (2010). Double transection of complete duodenal circumference after blunt abdominal trauma without other intra-abdominal injuries. *Wiener Klinische Wochenschrift*, *122*(1–2), 54–56. https://doi.org/10.1007/s00508-009-1300-x
17. Zimmerman, J., Norsworthy, K. J., & Brodsky, R. (2016). Balancing Therapy with Thrombopoietin Receptor Agonists and Splenectomy in Refractory Immune Thrombocytopenic Purpura: A Case of Postsplenectomy Thrombocytosis Requiring Plateletpheresis. *Case Reports in Hematology*, *2016*, 1–4. https://doi.org/10.1155/2016/5403612.