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Case Report

Thrombocytopenia Following Abdominal Aortic Aneurysm (AAA) Surgery: A Case Report

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Abstract

The Authors present a case report of a 69-year-old male with a known history of hypertension and previous abdominal aortic aneurysm (AAA) repair, who presented with gastrointestinal bleeding and was diagnosed with AAA and aortoenteric fistula. The patient underwent endovascular repair of intrarenal AAA and femoral-femoral bypass. However, postoperatively, he developed severe thrombocytopenia with persistent low platelet counts despite platelet transfusions. Hematology consultation was obtained, and the patient showed a positive response to intravenous methylprednisolone therapy. This case highlights the occurrence of thrombocytopenia as a complication following AAA surgery and the successful management with corticosteroids.

Keywords: Thrombocytopenia; Abdominal aortic aneurysm; Hypertension; Gastrointestinal; Fresh frozen plasma.

Introduction

Thrombocytopenia is a condition characterized by a low platelet count in the blood, which can lead to an increased risk of bleeding. It can be caused by factors such as decreased platelet production, increased platelet destruction, increased platelet consumption, or certain medications. Symptoms of thrombocytopenia include easy bruising, prolonged bleeding, petechiae, and bleeding from various sources [1].

The treatment approach depends on the underlying cause and severity of the condition, ranging from addressing the root cause to platelet transfusions, medications, or surgical interventions. Regular monitoring and appropriate medical care are crucial for managing thrombocytopenia effectively and

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preventing complications related to bleeding [2]. However, its occurrence following abdominal aortic aneurysm (AAA) surgery is relatively rare [3]. We present a case of thrombocytopenia in a patient who underwent endovascular repair of intrarenal AAA, emphasizing the importance of prompt recognition and management of this condition.

Case presentation

A 69-year-old male with a past medical history of hypertension and previous abdominal aortic aneurysm (AAA) repair presented to the hospital with a one-week history of gastrointestinal bleeding. He reported blood in his stool, accompanied by symptoms of dizziness and fainting. Concerned about these alarming symptoms, he sought medical attention and was admitted to King Hamad University Hospital (KHUH) for further investigation.

Upon admission, the patient underwent a comprehensive diagnostic workup, which revealed the presence of an AAA and aortoenteric fistula. The AAA repair was deemed necessary to prevent rupture, a potentially life-threatening complication. Preoperative laboratory results showed a hemoglobin level of 10.5 g/dL, white blood cell count of 9.3 × 10 ^ 9/L, and platelet count of 417 × 10 ^ 9/L. The patient subsequently underwent endovascular repair of the intrarenal abdominal aortic aneurysm. Intraoperatively, findings included the presence of an aneurysm involving the common iliac artery (CIA) and diffuse enlargement of the femoral arteries. The left femoral artery was also found to be occluded with thrombi. To ensure adequate blood flow, a femoral-femoral bypass was performed with satisfactory pulses.

Following the surgery, the patient was initially transferred to the intensive care unit (ICU) for close monitoring of vital signs and postoperative recovery. He remained hemodynamically stable and afebrile during his stay in the ICU. However, a significant complication emerged as the patient developed severe thrombocytopenia, with his platelet count dropping to zero. Concerned about this unexpected finding, the hematology team was consulted for further evaluation. Multiple platelet transfusions were administered to address thrombocytopenia, but they failed to improve the patient's platelet count. A thorough investigation was undertaken to determine the cause of the thrombocytopenia, considering potential factors such as rifampicin-induced thrombocytopenia or cholesterol embolism. However, the blood film analysis showed no evidence of platelet clumps, suggesting an alternative etiology.

In addition to ongoing platelet transfusions, the patient was started on intravenous methylprednisolone therapy (500 mg once daily) for three days, as advised by the hematology team. The introduction of steroids yielded positive results, with the patient's platelet count gradually improving over the subsequent days. Furthermore, episodes of gastrointestinal bleeding were managed effectively with the administration of fresh frozen plasma (FFP) and platelet transfusions. Throughout his hospital course, the patient required multiple transfusions due to dropping hemoglobin levels. An upper gastrointestinal endoscopy performed by Dr. Sagar did not reveal any evidence of upper

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gastrointestinal bleeding. The patient was also evaluated by the cardiology team, who was assessed as having a moderate risk for operative complications.

To manage the hypertension, the patient was prescribed a regimen of antihypertensive medications, including hydralazine 75 mg three times daily, amlodipine 10 mg once daily, and labetalol 200 mg twice daily. An echocardiogram was performed, showing a preserved ejection fraction of 65% with mild aortic regurgitation. In summary, this case presents a 69-year-old male with a history of hypertension and previous AAA repair who developed severe thrombocytopenia following abdominal aortic aneurysm surgery. Despite platelet transfusions, the patient's platelet count remained persistently low, prompting the initiation of methylprednisolone therapy. The introduction of steroids resulted in a positive response, with a gradual increase in platelet count and successful management of gastrointestinal bleeding episodes. The patient's hypertension was effectively controlled with antihypertensive medications.

Discussion

Thrombocytopenia, defined as a decrease in platelet count, is a known complication following various surgical procedures. In the presented case, a 69-year-old male developed severe thrombocytopenia following abdominal aortic aneurysm (AAA) repair surgery. This rare complication posed challenges in both diagnosis and management. Author will discuss the possible etiologies of postoperative thrombocytopenia in this context and explore the role of platelet transfusions and steroids in its treatment.

The etiology of postoperative thrombocytopenia can be multifactorial and difficult to ascertain. In this case, several potential causes were considered, including rifampicin-induced thrombocytopenia and cholesterol embolism. Rifampicin is a known medication associated with immune-mediated thrombocytopenia, and cholesterol embolism can result from manipulation of the atherosclerotic aorta during surgery.

However, the absence of platelet clumps on the blood film analysis suggested an alternative underlying mechanism. The management of postoperative thrombocytopenia centers around two key aspects: platelet transfusions and adjunctive therapies such as steroids. Platelet transfusions are the mainstay treatment for acute bleeding and are often utilized to raise platelet counts in thrombocytopenic patients [4].

However, in this case, platelet transfusions failed to improve the patient's platelet count. This suggests that the underlying cause of thrombocytopenia might have been immune-mediated or related to other factors not addressed by platelet transfusions alone. Intravenous methylprednisolone therapy was initiated in this case based on the suspected immune-mediated etiology of thrombocytopenia.

Steroids have been used as adjunctive therapy in cases of immune-mediated thrombocytopenia, where platelet destruction is driven by autoantibodies [5].

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In the presented case, the patient demonstrated a favorable response to methylprednisolone, with a gradual increase in platelet count. This suggests that the underlying mechanism of thrombocytopenia might have been immune-mediated, and steroids played a role in suppressing the immune response. The patient experienced episodes of gastrointestinal bleeding during his hospital stay, which were effectively managed with fresh frozen plasma (FFP) and platelet transfusions. Gastrointestinal bleeding can occur because of thrombocytopenia, highlighting the importance of prompt and adequate management to prevent life-threatening hemorrhage.

Additionally, the patient's hypertension required careful control during the hospitalization. Patient was managed with a combination of antihypertensive medications, including hydralazine, amlodipine, and labetalol. Optimal blood pressure control is crucial to minimize the risk of complications, particularly in the context of aortic surgery.

The presented case emphasizes the need for a multidisciplinary approach in managing complex surgical cases with complications such as thrombocytopenia. Collaboration between vascular surgery, hematology, and other relevant specialties is vital for accurate diagnosis, appropriate management, and optimal patient outcomes.

Comparison with previous case report studies

These two case reports involve thrombocytopenia in patients undergoing abdominal aortic aneurysm (AAA) surgery.

Case Report 1 describes a patient who developed acute-onset thrombocytopenia and disseminated intravascular coagulation (DIC) following previous coronary artery bypass grafting. Despite successful AAA surgery, the patient's thrombocytopenia and DIC persisted, requiring multidisciplinary management. The condition improved after Helicobacter pylori eradication therapy, warfarin, and oral tranexamic acid [6].

Case Report 2 involves a patient with a history of hypertension and previous AAA repair who developed severe thrombocytopenia following endovascular repair of an intrarenal AAA. Platelet transfusions and corticosteroid therapy were administered, resulting in a positive response. The patient showed gradual improvement in platelet counts and effective control of bleeding episodes with transfusions.

A comparison of the two cases highlights the different etiologies and management strategies for thrombocytopenia in AAA surgery.

Case Report 1 suggests an association between previous cardiac surgery and the development of thrombocytopenia and DIC, requiring multidisciplinary management beyond surgical intervention.

In contrast, Case Report 2 presents thrombocytopenia of unclear etiology but with a positive response to platelet transfusions and corticosteroid therapy.

Overall, these case reports emphasize the need for prompt recognition and appropriate management of thrombocytopenia in the context of AAA surgery. Further research is necessary to enhance understanding of the underlying mechanisms and optimize treatment strategies for this condition.

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Comparative case report analysis

This comparative case report analysis examines two distinct complications following vascular surgeries: thrombocytopenia following abdominal aortic aneurysm (AAA) surgery and postimplantation syndrome following endovascular aneurysm repair (EVAR).

In the case of thrombocytopenia following AAA surgery, a 69-year-old male underwent endovascular repair of AAA and developed severe thrombocytopenia postoperatively. Despite platelet transfusions, the platelet count did not improve. However, the patient showed a positive response to systemic steroids, leading to an increasing platelet count and control of bleeding episodes.

In the case of postimplantation syndrome following EVAR, a patient presented with symptoms of fever, leukocytosis, and elevated C-reactive protein in the third week after the procedure. Additionally, the patient experienced thrombocytopenia, which gradually resolved with supportive measures and systemic steroids [7].

While both complications shared similarities in terms of their occurrence within the postoperative period, they differed in terms of underlying pathogenesis and temporal patterns. Thrombocytopenia following AAA surgery occurred immediately postoperatively, persisted despite platelet transfusions, and responded to systemic steroids. In contrast, postimplantation syndrome following EVAR exhibited a delayed-onset inflammatory response in the third week post-procedure, with thrombocytopenia resolving gradually with supportive measures and systemic steroids. Recognizing these differences is crucial for appropriate management and optimal patient outcomes. Further research is needed to better understand the mechanisms underlying these complications and develop targeted therapeutic strategies.

In conclusion, this case report highlights the occurrence of severe thrombocytopenia following AAA repair surgery. The etiology of postoperative thrombocytopenia can be challenging to determine, and immune-mediated mechanisms should be considered. Platelet transfusions are the standard treatment for acute bleeding [8]; however, adjunctive therapies such as steroids may be necessary for immune-mediated cases. Prompt recognition and appropriate management of thrombocytopenia are crucial to prevent life-threatening bleeding complications and optimize patient recovery [9]. Further studies are warranted to explore the underlying mechanisms and optimal treatment strategies for postoperative thrombocytopenia in the context of AAA surgery.

Conclusion

Thrombocytopenia can occur as a complication following AAA surgery and should be recognized promptly. This case report highlights the importance of considering immune-mediated causes and the potential role of corticosteroid therapy in managing thrombocytopenia refractory to platelet transfusions. Further research is warranted to better understand the pathogenesis and optimal management strategies for thrombocytopenia in this setting.

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