

Low molecular weight heparin-induced thrombocytopenia complicating bariatric surgery: A case report

Serkan Sucu*; Derya Salim Uymaz; Yunus Yavuz

***Corresponding Author: Serkan Sucu**

Department of Surgery, Maltepe Mahallesi, Davutpasa Caddesi, No:4, Zeytinburnu, Istanbul, Turkey.

Tel: +90-212-467-87-00; Email: ssucu@ku.edu.tr

Abstract

This case report presents a patient who developed Low Molecular Weight Heparin (LMWH)-induced thrombocytopenia following bariatric surgery. The patient received LMWH prophylaxis but experienced bleeding and a decline in platelet count. Diagnostic tests confirmed heparin-induced thrombocytopenia. Prompt management involved discontinuing LMWH and switching to alternative anticoagulation. Clinicians should be aware of this potential complication in bariatric surgery patients receiving LMWH prophylaxis.

Keywords: Bariatric surgery; Low-molecular-weight heparin; Obesity; Thrombocytopenia.

Abbreviations: APTT: Activated Partial Thromboplastin Time; BMI: Body Mass Index; INR: International Normalized Ratio; LMWH: Low Molecular Weight Heparins; PT: Prothrombin Time; PF4: Platelet Factor 4 Antibody.

Introduction

Venous thromboembolic events are among the most fatal complications of bariatric procedures and require attentive prophylaxis. Anti-embolic stockings, sequential pneumatic compression devices, early mobilization, and pharmacologic prophylaxis with Low Molecular Weight Heparins (LMWH) are the most common practices. The use of LMWH has been accepted as a safe choice during bariatric operations [1]. Yet, they can still cause bleeding and heparin-induced thrombocytopenia [2]. In this report, we present a patient that had undergone a bariatric procedure complicated with LMWH-induced thrombocytopenia during the postoperative period.

Case Presentation

A forty-six-year-old male patient with a Body Mass Index (BMI) of >38.1 kg/m² and five years

duration of type 2 diabetes mellitus and hypertension was admitted for bariatric surgery. Surgical options were discussed with the patient, and a laparoscopic Roux-en-Y gastric bypass procedure was planned. There was no known personal or family history of hematological disorders. Patient history was significant for cerebrovascular events in which the patient was followed in the intensive care unit and received low molecular heparin treatment.

Preoperative blood tests, including complete blood count, aPTT, PT, INR, viral serology, dexamethasone suppression test, and the rest of the serum chemistry, were normal. In abdominal ultrasonography, Grade 1 hepatosteatorosis was detected. In preoperative blood tests, his hemoglobin level was 16.5 g/dl, and his thrombocyte level was 286.000 /uL. Pulmonary function tests and upper gastrointestinal endoscopy were unremarkable. The cardiological evaluation revealed a 55% ejection fraction and a minimal aortic root dilatation. A preoperative liver shrinkage diet was given for two weeks, and 0.4 ml enoxaparin (Clexane 0.4 ml injectable solution; Sanofi, Paris, France) was applied subcutaneously 8 hours before surgery.

After preoperative prophylaxis with 2 grams of cefazolin. A standard laparoscopic Roux-en-Y gastric bypass was performed with four ports and an automatic liver retractor. The lesser sac was entered after perigastric dissection, thus preserving all the vessels and nerves. A 30 ml gastric pouch was created, and gastrojejunostomy 60 cm distal to the Treitz ligament was performed with a linear stapler of 3.5 mm height (ENDOPATH Endoscopic Linear Cutter 35 mm; Ethicon Endo-Surgery, Inc., New Jersey, United States of America). A 150 cm alimentary limb was measured, and jejunojunostomy was created with a 2.5 mm-high linear stapler (ENDOPATH Endoscopic Linear Cutter 35 mm; Ethicon Endo-Surgery, Inc., New Jersey, United States of America). The jejunum was resected proximal to gastrojejunostomy with a 2.5 mm-high linear stapler (ENDOPATH Endoscopic Linear Cutter 35 mm; Ethicon Endo-Surgery, Inc., New Jersey, United States of America) and Roux-en-Y format was created. Stapler defects were closed in two layers; the first one with self-locking absorbable (3/0 V-Loc) and the second layer with 3/0 absorbable suture (3/0 Vicryl). 4 ml fibrin glue were sprayed over all anastomotic and stapler lines. The Petersen and all other mesenteric defects were closed with nonabsorbable sutures. There was no perioperative incident, and a 7 mm Jackson-Pratt drain was placed near the gastrojejunal anastomosis. The patient was observed in the post-anesthesia care unit for a few hours and subsequently taken to the surgical ward. Routine thromboembolism prophylaxis with anti-thromboembolic stockings, sequential pneumatic compression device, and early mobilization. A 4 ml enoxaparin (Clexane 0.4 ml injectable solution; Sanofi, Paris, France) was injected subcutaneously ten hours after the patient's transfer to the surgical ward from the post-anesthesia care unit. The patient received standard analgesic treatment, including intravenous paracetamol and tramadol; no antibiotic treatment was given postoperatively. The postoperative course was unremarkable except for a 330-ml-hemorrhagic drainage in 24 hours. In the physical examination, oral and skin petechiae were detected (Figure 1). A complete blood count was ordered, and his thrombocyte count was found to be 21.000/uL. A blood smear was ordered, but no pathological findings were detected. The hematological department consulted the patient, and enoxaparin (Clexane 0.4 ml injectable solution; Sanofi, Paris, France) was replaced with IV fondaparinux (Arixtra; Aspen pharmacare holdings, Durban, South Africa) 10 mg/day. Platelet Factor 4 Antibody test (PF4) performed on postoperative day 1 was negative; however, it became positive on day 9. Moreover, the patient's 4T score was 6, which indicates the patient has a high risk for

heparin-induced thrombocytopenia.

A routine fluoroscopic examination performed to assess the staple lines and gastrojejunal anastomosis on postoperative day 2 was normal. However, hemorrhagic drainage continued, and the patient had bleeding from his gingivae on postoperative day 2 (Figure 2). Because of this reason, the IV fondaparinux dose was reduced to 5 mg from 10 mg and oral transaminase mouthwash was added to his treatment. The volume of hemorrhagic drainage on the postoperative second and third postoperative days was 250 ml and 140 ml, respectively. The patient was followed with iv 5 mg fondaparinux and daily complete blood count examinations. In complete blood count examinations, his hemoglobin level was 15.9 g/dL on postoperative day 1 but gradually decreased to the level of 7.2 on postoperative day 7. Then levels gradually increased to the level of 10.1 g/dl on postoperative day 14 without transfusion. Thrombocyte count increased gradually up to physiological levels in his postoperative course. On the tenth postoperative day, the surgical drain was removed, and the patient was discharged with subcutaneous fondaparinux. The patient fully recovered and was followed up in the surgical and hematological outpatient clinics. Fondaparinux treatment was switched to warfarin after one month of treatment. No thrombocytopenia or thrombotic complications were seen during the outpatient follow-up. In addition, the patient lost 40 kilograms one year after surgery.

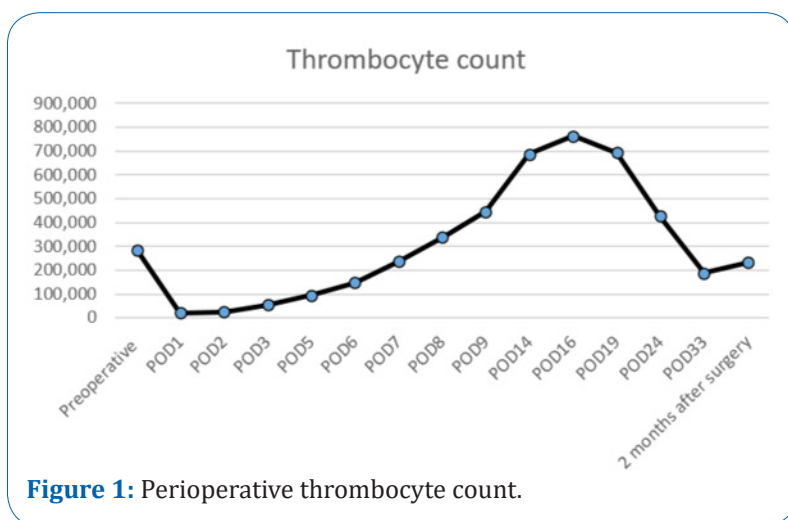


Figure 1: Perioperative thrombocyte count.



Figure 2: Oral petechiae.

Discussion

Patients undergoing bariatric surgery have a particularly higher risk for deep venous thrombosis [3]. In addition to extreme body weight, high intra-abdominal pressure and anti-Trendelenburg positioning reduce venous backflow, which causes an increased risk of thromboembolism [1]. The incidence of venous thromboembolism after gastric surgery was 2.1% [4]. As a result, all these factors contribute to the risk of venous thromboembolism and mandate prophylaxis against thromboembolism.

Enoxaparin is a low molecular weight heparin that binds to and potentiates antithrombin III to form a complex that irreversibly inactivates factor Xa [5]. Enoxaparin is a relatively safe drug compared to unfractionated heparin. In addition, low molecular weight heparins have a lower risk of heparin-induced thrombocytopenia than unfractionated heparin [6].

Heparin-induced thrombocytopenia is a syndrome in which heparin-dependent antibodies bind to heparin platelet factor 4 complexes to activate platelets. As a result, a hypercoagulable state predominates. It is diagnosed by combining both clinical findings and laboratory testing for heparin-dependent platelet-activating HIT antibodies. Clinical findings comprise findings consistent with thromboembolic events, necrosis located at heparin injection sites, and rarely findings consistent with bleeding, including petechiae and ecchymosis [7]. Possible complications in patients with heparin-induced thrombocytopenia include venous and arterial thrombotic events, limb amputation, venous gangrene, and bleeding related to the treatment of HIT. With appropriate treatment, thrombocytopenia can recover in a week, but in aggressive cases, it could take longer periods [7]. Treatment for HIT consists of cessation of low molecular weight heparin and switching to a different method of anticoagulation due to the increased risk of prothrombotic events in patients with HIT and underlying disorders requiring anticoagulation.

Fondaparinux is a safe choice for patients with HIT. It is a non-heparinoid pentasaccharide selective for antithrombin [8]. Even though fondaparinux is a derivative of heparin, it does not promote antibody binding to PF4. Because of this reason, fondaparinux is a safe choice for the prevention of thrombotic complications of HIT [9]. Moreover, patients with HIT require anticoagulation for at least 4 weeks if a thrombotic event did not occur and for at least 3 months if there were any thrombotic events [10]. For long-term anticoagulation, warfarin is one of the options, as in our patients.

In the current case, the patient underwent bariatric surgery under enoxaparin prophylaxis and presented with bleeding complications, including oral petechiae and intraabdominal bleeding with an abrupt decline in platelet count. Even though his PF4 antibody was negative on postoperative day 1, it turned positive on day 9, which was consistent with a diagnosis of heparin-induced thrombocytopenia. Our case points out that the risk of heparin-induced thrombocytopenia also exists in bariatric surgery and with enoxaparin prophylaxis which was thought to have a lower risk of thrombocytopenia [9]. In addition, our case represents a rare presentation of HIT which is bleeding (Hemorrhagic drainage and oral petechiae) because HIT usually presents with thrombotic complications rather than bleeding complications [7].

Conclusion

Even though it is rare, enoxaparin can also cause thrombocytopenia, like unfractionated heparin. Hemorrhagic drainage from drains in surgical patients under low molecular weight prophylaxis should include heparin-induced thrombocytopenia in the differential diagnosis. Heparin-induced thrombocytopenia is managed by cessation of causative agents, including unfractionated and low molecular weight heparins, and switching to alternative non-heparin anticoagulation such as fondaparinux, lepirudin, and argatroban.

Disclosure: The authors of this manuscript have no conflicts of interest to disclose.

References

1. L Gattinoni, P Taccone, E Carlesso, et al. Prone position in acute respiratory distress syndrome. Rationale, indications, and limits, *Am. J. Respir. Crit. Care Med.* 2013; 188: 1286-1293.
2. World Health Organisation, Clinical Management of Severe Acute Respiratory Infection (SARI) when COVID-19 Disease is Suspected-Interim Guidance, WHO. 2020.
3. Guérin J, Reignier JC, Richard, PROSEVA Study Group, et al. Prone positioning in severe acute respiratory distress syndrome, *N. Engl. J. Med.* 2013; 368: 2159-2168.
4. Alhazzani W, Møller MH, Arabi YM, et al. Surviving sepsis campaign: Guidelines on the management of critically ill adults with coronavirus disease 2019 (COVID-19). *Intensive Care Med.* 2020; 46: 854e87
5. Zalavras CG, Lieberman JR. Osteonecrosis of the femoral head: Evaluation and treatment. *J Am Acad Orthop Surg.* 2014; 22: 455-464.

Manuscript Information: Received: June 19, 2023; Accepted: August 01, 2023; Published: August 08, 2023

Authors Information: Serkan Sucu*; Derya Salim Uymaz; Yunus Yavuz
Department of Surgery, Koç University School of Medicine, Istanbul, Turkey.

Citation: Serkan S, Salim UD, Yunus Y. Low molecular weight heparin-induced thrombocytopenia complicating bariatric surgery: A case report. *Open J Clin Med Case Rep.* 2023; 2085.

Copy right statement: Content published in the journal follows Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>). © **Sucu S (2023)**

About the Journal: Open Journal of Clinical and Medical Case Reports is an international, open access, peer reviewed Journal focusing exclusively on case reports covering all areas of clinical & medical sciences.

Visit the journal website at www.jclinmedcasereports.com

For reprints and other information, contact info@jclinmedcasereports.com