PAR Perioperative Anesthesia Reports

CASE REPORT

Perioperative anesthetic management in a patient at high risk of bleeding secondary to Glanzmann thrombasthenia: a case report

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ABSTRACT

Patients with rare inherited bleeding disorders require highly specialized perioperative management, particularly during major surgical procedures. This case report aimed to describe the anesthetic and hemostatic management of a patient with Glanzmann thrombasthenia undergoing partial colectomy under general anesthesia. A descriptive case report was conducted after approval by the local ethics committees and written informed consent from the patient. Perioperative management required multidisciplinary coordination involving anesthesiology, surgery, and hematology teams. The patient received preemptive recombinant activated factor VII (rFVIIa), platelet concentrate, and tranexamic acid. Despite conversion from laparoscopic to open surgery due to intraoperative complications, bleeding was successfully controlled, with maintenance of hemodynamic stability and favorable postoperative evolution until hospital discharge. This case highlights the importance of individualized hemostatic protocols and multidisciplinary planning to ensure safe perioperative management in patients with Glanzmann thrombasthenia.

KEYWORDS

Glanzmann thrombasthenia; colorectal neoplasm; general anesthesia

INTRODUCTION

Glanzmann thrombasthenia (GT) is a rare autosomal recessive bleeding disorder caused by a quantitative or functional defect of the platelet membrane glycoprotein IIb/IIIa, which is essential for platelet aggregation (Figure 1). This defect impairs clot formation and retraction, resulting in mucocutaneous bleeding of variable severity, potentially life-threatening, despite normal platelet counts[1]. Its estimated incidence is approximately 1:1,000,000 individuals[2]. Anesthetic management in these patients is particularly challenging, requiring individualized hemostatic strategies, careful selection of anesthetic techniques, and rigorous perioperative monitoring, preferably within a multidisciplinary setting[1].

The reported case is rare in anesthetic practice, with few similar cases described in national and international literature, reinforcing its scientific and educational relevance. Therefore, the aim of this report is to describe the anesthetic management and perioperative care of a patient with Glanzmann thrombasthenia undergoing partial colectomy under general anesthesia.

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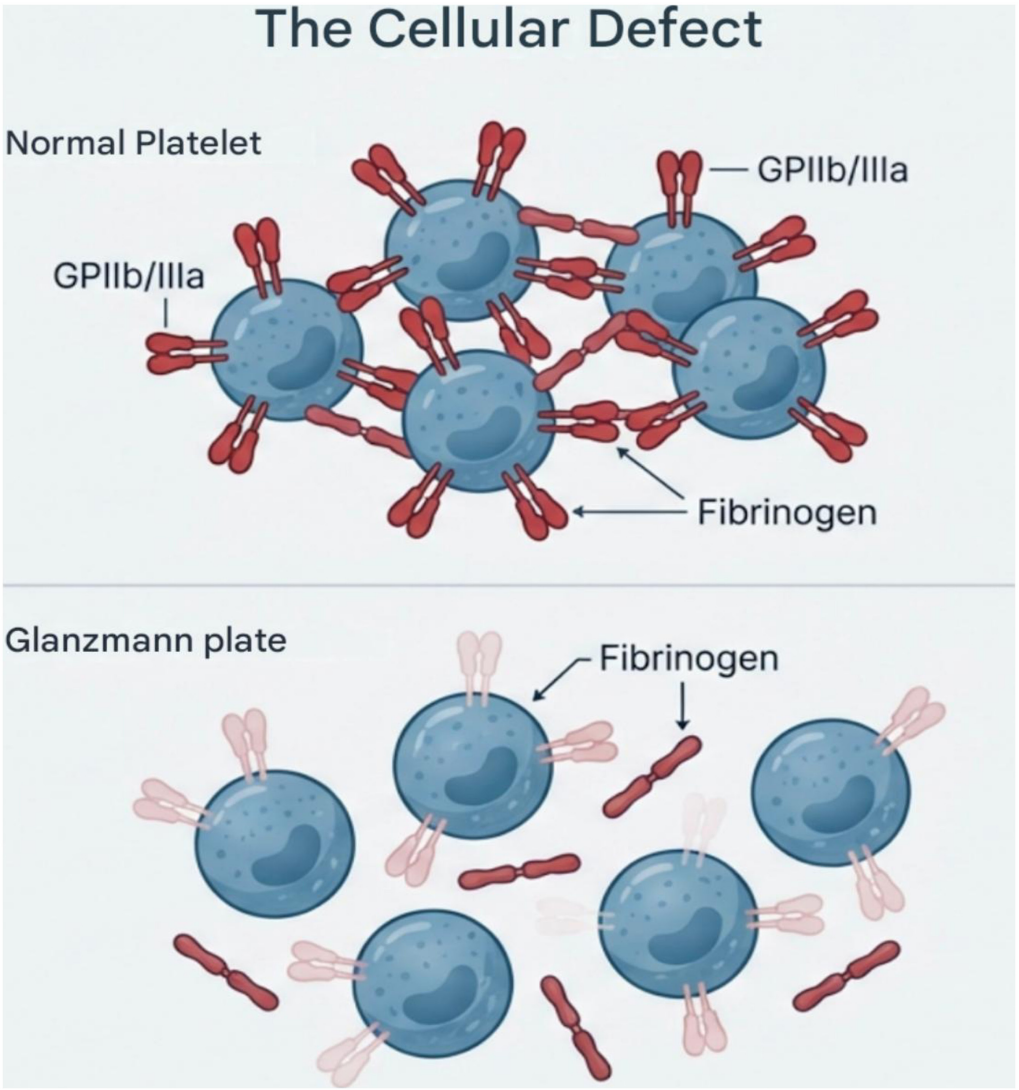

Figure 1. Pathophysiological mechanism of glycoprotein IIb/IIIa dysfunction in the platelet membrane leading to impaired clot formation and clot retraction.
Source: Image generated by the authors using the Google NotebookLM tool (Premium/Advanced version, based on the Gemini 1.5 Pro/Flash model, 2026.

CASE REPORT

A 36-year-old female patient, weighing 60 kg and measuring 170 cm in height, diagnosed with right-sided colon adenocarcinoma, was referred for laparoscopic partial colectomy. The patient had a previous diagnosis of Glanzmann thrombasthenia (GT), characterized by a history of mucocutaneous bleeding and confirmed by failure of platelet aggregation on light transmission aggregometry testing. Chronic clinical management included supplementation with ferrous sulfate, folic acid, B-complex vitamins, and intermittent use of tranexamic acid (TXA) and recombinant activated factor VII (rFVIIa). Physical examination revealed a stable patient with preserved cardiopulmonary reserve and no active bleeding signs. Laboratory tests showed normal platelet count and coagulation parameters (PT and aPTT), which is typical of GT, in which the defect is qualitative (glycoprotein IIb/IIIa) rather than quantitative.

Given the high hemorrhagic risk associated with the disease, a multidisciplinary perioperative protocol involving Anesthesiology, Coloproctology, and Hematology teams was established. The perioperative plan included strategic blood product preparation consisting of three units of packed red blood cells, six units of platelet concentrate, and six units of cryoprecipitate. As hemostatic prophylaxis, six units of platelet concentrate were transfused three hours before surgery, and rFVIIa 6 mg (100 µg/kg) was administered immediately after anesthetic induction. In addition, supplementary doses of rFVIIa (6 mg) were made readily available for administration every three hours in the event of refractory intraoperative bleeding.

Standard monitoring was established. Central venous access and neuraxial techniques were avoided to minimize the risk of iatrogenic bleeding and neuraxial hematoma. Anesthetic induction was performed with fentanyl (250 µg), lidocaine (80 mg), propofol (120 mg),

and rocuronium (50 mg), followed by uncomplicated orotracheal intubation. Anesthesia was maintained with sevoflurane (2%) and remifentanil (0.1 µg/kg/min), combined with a multimodal analgesic strategy including dexmedetomidine (50 µg), ketamine (30 mg), lidocaine (100 mg), and magnesium sulfate (2 g). Antifibrinolytic management consisted of a loading dose of TXA (30 mg/kg), followed by continuous infusion (10 mg/kg/h).

Approximately 50 minutes after the start of surgery, massive extravasation of endoscopic tattoo dye into the retroperitoneum was identified, impairing visualization of anatomical planes and compromising surgical safety, which required conversion to open surgery. During laparotomy, the patient developed profuse bleeding that was controlled with administration of a second dose of rFVIIa (6 mg) and six units of platelet concentrate.

After meticulous hemostasis and segmental colon resection, neuromuscular blockade was reversed with sugammadex (200 mg). The patient was extubated in the operating room with hemodynamic stability. Total surgical time was 4 hours and 40 minutes. The patient evolved without further hemorrhagic episodes and was discharged after three days of hospitalization.

DISCUSSION

Glanzmann thrombasthenia (GT) represents a critical challenge for anesthesiologists. Although platelet counts are usually normal, dysfunction of the glycoprotein IIb/IIIa complex (integrin αIIbβ3) prevents fibrinogen binding between platelets, impairing platelet aggregation and formation of the platelet plug, making major procedures such as colectomy high-risk scenarios for hemorrhage[3]. The successful outcome of this case relied on the transition from prophylactic planning to rapid response to intraoperative bleeding, guided by clinical reasoning based on the pathophysiology of hemostasis.

The decision to use preemptive recombinant activated factor VII (rFVIIa), rather than relying solely on platelet transfusion, was based on the risk of anti-HLA or anti-GPIIb/IIIa alloimmunization, a common complication in GT that may lead to refractoriness to future platelet transfusions[4]. Administration of rFVIIa was intended to bypass the molecular platelet defect regardless of the GP IIb/IIIa receptor. At pharmacological doses, rFVIIa binds directly to the surface of activated platelets independently of tissue factor (TF), activating factors IX and X and forming the prothrombinase complex. This mechanism results in rapid and massive thrombin generation, sufficient to convert fibrinogen into a dense and stable fibrin network that compensates for defective platelet aggregation and restores hemostasis, even in alloimmunized patients in whom isolated platelet transfusion may be ineffective[5]. Consequently, rFVIIa is recommended as essential monotherapy or as an adjunctive therapy when transfusional response is inadequate[6].

Despite its efficacy, rFVIIa carries a potential risk of thromboembolic events. Therefore, careful risk-benefit assessment is essential, employing the lowest effective dose for the shortest necessary duration[7].

During conversion to laparotomy, required because of loss of anatomical planes following extravasation of endoscopic tattoo dye, the patient developed profuse bleeding, with an estimated blood loss of 500 mL. The decision to administer an additional 6 mg dose of rFVIIa and six units of platelet concentrate was based on clinical criteria, particularly a 25% decrease in mean arterial pressure. Unlike strategies relying solely on blood products, the combination of rFVIIa with tranexamic acid (loading dose of 30 mg/kg followed by continuous infusion of 10 mg/kg/h) aimed to maximize clot stabilization. By inhibiting plasmin activity, tranexamic acid prevents degradation of the fibrin network generated by rFVIIa without significantly increasing thrombotic risk[8].

The absence of bedside viscoelastic testing methods, such as thromboelastography (TEG) or rotational thromboelastometry (ROTEM), represented an important diagnostic limitation. Conventional coagulation tests (PT and aPTT) are poorly sensitive in GT because they do not adequately assess primary hemostasis or platelet function, whereas viscoelastic tests evaluate clot formation dynamics[9].

The characteristic GT pattern in these tests is a marked reduction in Maximum Amplitude (MA), indicating formation of a mechanically fragile and hypofunctional clot despite preserved clot initiation time (Figure 2). If available, viscoelastic monitoring could have enabled goal-directed therapy, allowing more precise guidance regarding additional doses of rFVIIa or further platelet transfusions based on real-time clot firmness.

Furthermore, such monitoring would be important to mitigate the potential thromboembolic risks associated with potent prohemostatic agents by balancing therapeutic efficacy and vascular safety. In the absence of this technology, the therapeutic strategy relied on a fixed-dose protocol combined with rigorous clinical surveillance of surgical hemostasis, ensuring patient safety through early empirical interventions supported by the pathophysiology of the disease[10].

The impossibility of neuraxial techniques due to the risk of neuraxial hematoma required a multimodal general anesthesia approach. The combination of dexmedetomidine, ketamine, lidocaine, and magnesium sulfate provided excellent hemodynamic stability and enabled an opioid-sparing strategy. This was essential

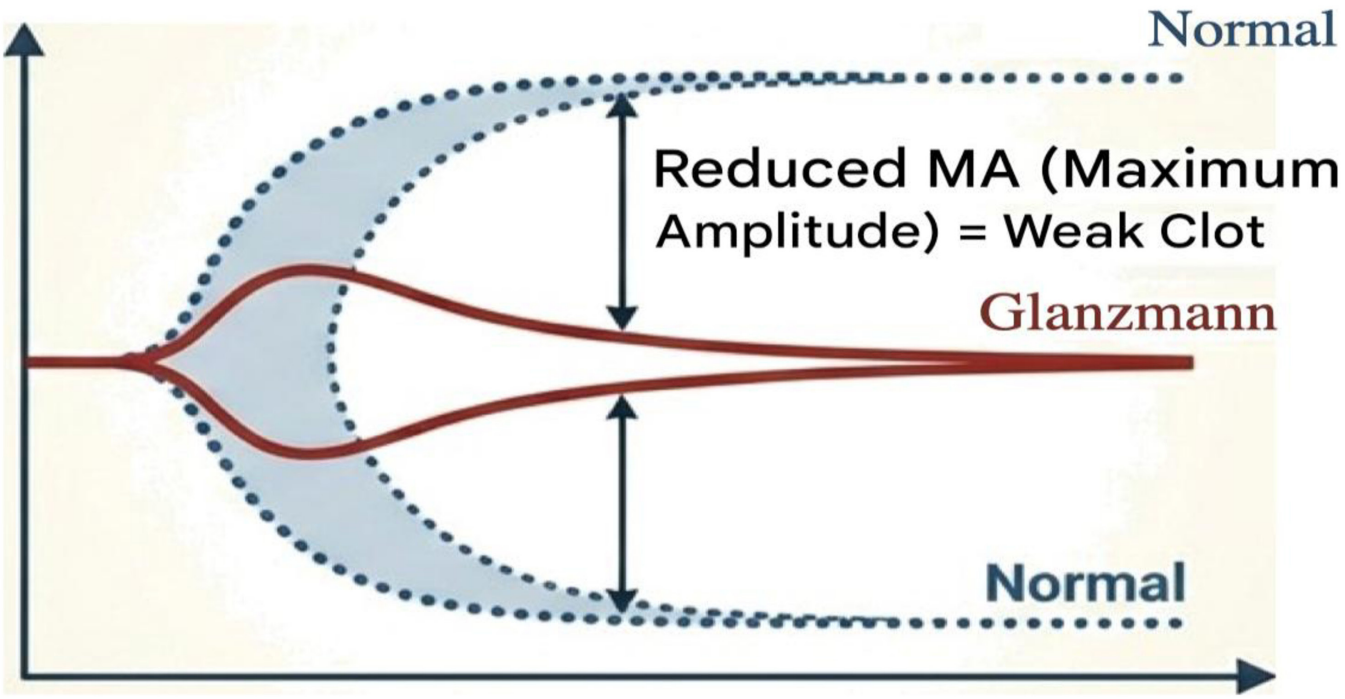

Figure 2. Viscoelastic test comparing a normal dynamic tracing with a characteristic tracing of Glanzmann's thrombasthenia, demonstrating reduced maximum amplitude and formation of a weak clot.
Source: Image generated by the authors using the Google NotebookLM tool (Premium/Advanced version, based on the Gemini 1.5 Pro/Flash model, 2026.

for rapid postoperative recovery and safe extubation in the operating room after reversal of neuromuscular blockade with sugammadex (200 mg).

This case demonstrates that the management of patients with GT requires a scalable hemostatic protocol. The use of rFVIIa as the central therapeutic strategy, based on its ability to bypass the platelet aggregation defect, proved effective in maintaining safety during a high-complexity procedure complicated by unexpected surgical conversion.

The favorable clinical outcome was supported by intensive monitoring and strict adherence to the hemostatic protocol. This evolution reinforces the premise that combined management integrating antifibrinolytic agents and strategic transfusion therapy is essential for perioperative safety in Glanzmann's thrombasthenia. Given the rarity of this coagulopathy and the scarcity of robust clinical trials, detailed documentation of complex cases remains crucial. Such evidence contributes not only to improving current anesthetic practices but also to supporting the development of evidence-based therapeutic guidelines aimed at reducing risks in high-complexity surgical settings until multicenter studies establish definitive protocols.

CONCLUSION

This case report highlights the challenges of anesthetic and hemostatic management during major surgery in patients with Glanzmann's thrombasthenia. An approach based on anticipatory transfusion strategy and close integration among anesthesiology, surgery, and hematology teams was decisive for the favorable outcome. Even in the presence of a rare and high-risk coagulopathy, structured planning and multidisciplinary management proved essential for perioperative safety. This report reinforces the need for further research and specific guidelines for these conditions in order to optimize therapeutic protocols, reduce risks, and improve surgical and anesthetic safety in complex clinical scenarios.

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This study was carried out at the Hospital de Base do Distrito Federal, Brasília, DF, Brazil.

Authors' contributions: Thiago Medeiros Pereira was responsible for conceptualization, methodology, investigation, data curation and writing – original draft. Fabricio Tavares Mendonça was responsible for conceptualization, methodology, writing – review & editing, supervision and project administration. Iuri Ferreira Lopes was responsible for methodology and writing – review & editing. Sergio Honorato Matos was responsible for conceptualization, investigation and resources.

Ethics statement: This study was approved by the local research ethics committee [Research Ethics Committee from Fundação de Ensino e Pesquisa em Ciências da Saúde (Foundation for Education and Research in Health Sciences), Brasília, DF, Brazil] on July 17, 2025, with CAAE 89783725.1.0000.5553.

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