

CASE REPORT

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Cesarean delivery in a pregnant woman with glanzmann thrombasthenia: Multimodal bleeding management supported by ankaferd blood stopper

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Abstract

Glanzmann Thrombasthenia (GT) is a rare inherited platelet disorder caused by qualitative or quantitative defects of the GPIIb/IIIa complex, leading to impaired platelet aggregation and severe bleeding risk. Obstetric management requires a multidisciplinary and individualized approach. We report a 33-year-old primigravid woman with hereditary GT diagnosed at age 9 who underwent cesarean delivery at 37 weeks under general anesthesia after failed induction. Preoperatively, one unit of apheresis platelets was transfused. Following cord clamping, recombinant factor VIIa (rFVIIa) and tranexamic acid were administered. After placental removal, bilateral uterine artery ligation using the modified O'Leary technique was performed, and topical Ankaferd Blood Stopper (ABS) was applied to the uterus and subcutaneous tissue. A subcutaneous hematoma on postoperative day 12 was successfully managed with evacuation and local measures, including repeat topical ABS application. This case highlights that cesarean delivery can be safely accomplished in GT with multimodal hemostatic strategies, including rFVIIa, antifibrinolytics, surgical devascularization, and topical hemostatic agents.

Keywords: Glanzmann thrombasthenia; cesarean section; rFVIIa; Ankaferd Blood Stopper; bleeding control

Introduction

Glanzmann thrombasthenia (GT) can be either hereditary or acquired. The hereditary form is an autosomal recessive disorder characterized by mutations involving chromosome 17q21, particularly the ITGA2B or ITGB3 genes [1]. Mutations in both genes can cause GT, and hundreds of mutations have been reported. The hereditary form is observed with a frequency of one in a million [2]. Acquired GT, on the other hand, typically results from an autoantibody attack against platelet α IIb β 3 or the formation of isoantibodies that impair proper function. Many hematological diseases that occur in adults, such as non-Hodgkin's lymphoma, can lead to antibody formation [3].

The hereditary form is a qualitative or quantitative platelet surface receptor disorder of GPIIb/IIIa (ITG α -IIb β 3), resulting

in defective platelet aggregation and reduced clot retraction. Patients typically develop spontaneous mucocutaneous bleeding, although some patients experience life-threatening hemorrhages. One study reported the presence of more than 1700 women with GT worldwide [4].

In the treatment of the disease, platelet transfusion and antifibrinolytic therapy are conventional treatment methods, and successful results have been achieved with the use of recombinant factor VIIa (rFVIIa) in recent years. Research continues for the safe treatment of bleeding episodes that occur in these patients. Although gene therapy and stem cell transplantation are potential novel approaches for treatment, these remain at the experimental level today [3].

The delivery process in pregnant women with Glanzmann thrombasthenia should be carefully managed due to the high

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risk of bleeding. Maternal and neonatal complications can be minimized through a multidisciplinary approach, individualized birth planning, and bleeding prevention strategies. The availability of blood transfusion and hemostatic agents, appropriate anesthesia selection, and close postpartum monitoring are of vital importance.

In this article, we aimed to present the clinical management of cesarean delivery that we performed in a pregnant woman with Glanzmann thrombasthenia. The study was conducted in accordance with the principles of the Declaration of Helsinki. Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Case Presentation

A 33-year-old primigravid patient diagnosed with Glanzmann thrombasthenia at age 9 was admitted to the obstetrics ward at 36 weeks and 5 days of gestation with diagnoses of hematuria and bilateral hydronephrosis. It was learned that the patient's hematuria complaint had begun at the 25th week of gestation and periodically intensified, leading to admissions to the urology and obstetrics departments. Upon detection of anemia in the patient, 2 units of packed red blood cells were administered. Follow-up laboratory values showed hemoglobin 11.4 g/dl, hematocrit 34%, and platelet count 154,000/mm³. Obstetric sonography revealed intrauterine growth restriction in the fetus (fetal AC 3rd percentile with normal Doppler studies). Amniotic fluid volume and placental location were normal.

Betamethasone had been previously administered due to admission for hematuria and preterm labor. Induction was planned for the patient at the 37th week of gestation, and hematology consultation was requested. The patient was induced with vaginal prostaglandin E₂ at 37 weeks. During follow-up, due to non-reassuring non-stress test results and failure to establish effective contractions, the case was delivered by cesarean section under general anesthesia. One unit of apheresis platelet concentrate was administered to the patient preoperatively. The cesarean delivery was performed under general anesthesia, which is the preferred approach in patients with coagulopathies due to the potential risks associated with neuraxial anesthesia. A 2100 g, 48 cm female infant was delivered in vertex presentation. After cord clamping, 90 micrograms/kg of recombinant factor VIIa (rFVIIa) was administered. (The second dose of the same amount of rFVIIa was given 2 hours after the first dose, and a third dose of rFVIIa (90 µg/kg) was administered 3 hours after the second dose.) Additionally, within five minutes after umbilical cord clamping, 5 IU oxytocin and 0.2 mg methylergonovine were administered intravenously in a slow and controlled manner to ensure patient safety.

Oxytocin was infused at a rate of 10-20 U/L throughout the operation. Additionally, after delivery of the fetus, 1 gram of tranexamic acid was administered intravenously (IV). (Tranexamic acid was administered 2 more times at 30-minute intervals, 1 gram each time). The uterus contracted adequately. After removal of the placenta, bilateral uterine artery ligation was performed using the modified O'Leary technique (Figure 1).

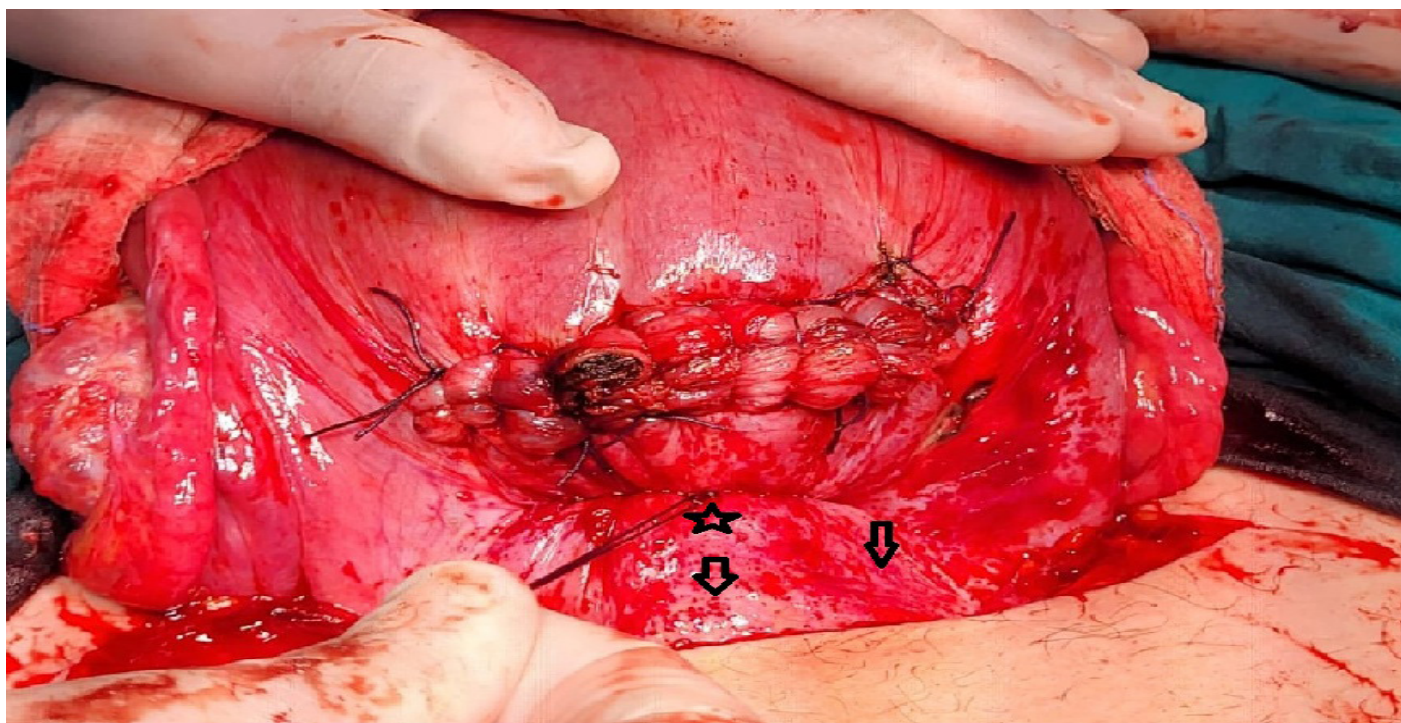


Figure 1. Bilateral uterine artery ligation performed using the modified O'Leary technique. Star indicates the site of the modified O'Leary suture. Thick arrows indicate spontaneous petechial bleeding secondary to platelet dysfunction.

Before closing the uterus, 10 ml of Ankaferd solution (Ankaferd Blood Stopper (ABS), manufactured by AND Pharmaceuticals, İstanbul, Türkiye) was applied to the endometrium. The Kerr incision made to the uterus was closed with continuous locking sutures. During bleeding control, a total of 20 ml of Ankaferd solution was applied to small bleeding areas on the anterior and posterior surfaces of the uterus. The anesthesiologist calculated that the patient had 1200 ml of blood loss throughout the operation. One drain was placed in the pouch of Douglas and one hemovac drain was placed above the muscle, and the operation was completed under stable conditions.

Complete blood count examination from cord blood showed the newborn's platelet count was within normal limits (187,000/mm³). Postpartum, tranexamic acid 1 g IV three times daily was administered for 5 days and methylergonovine 3 × 0.2 mg IV for 3 days. The patient's hemoglobin was 10.4 g/dl and hematocrit was 28% on postoperative day 3. Postoperative

drain follow-up revealed minimal serous drainage without evidence of active hemorrhage. The drainage amount progressively decreased, and no signs of ongoing bleeding were observed. The subcutaneous drain was removed. Given her stable condition, 10 ml of Ankaferd solution was administered through the hemovac drain placed above the muscle on day 5, and the drain was removed two hours later. The abdominal drain was also removed on day 5. On postoperative day 10, the patient's skin sutures were removed and she was discharged with initiation of a mini-pill. Two days later, the patient was readmitted due to subcutaneous bleeding. Approximately 150 cc of fibrinous-defibrinous hematoma was evacuated from the subcutaneous space. Twenty ml of Ankaferd solution was applied subcutaneously. The patient received two units of packed red blood cells. A culture was obtained through a 3 cm opening in the skin, debridement was performed, and the area was re-sutured (Figure 2).



Figure 2. Skin appearance 3 days after evacuation of hematoma formed at the Pfannenstiell incision site and debridement. Near the midline, one suture has dehiscd. this area was left for secondary healing.

Ten days later, the sutures were removed and the patient was discharged with stable findings. The patient was followed up at 6 months postoperatively. Pelvic ultrasonography showed

the uterus in normal position and size, endometrial thickness of 5.5 mm, and normal ovaries. The patient's incision scar was observed to be completely normal (Figure 3).

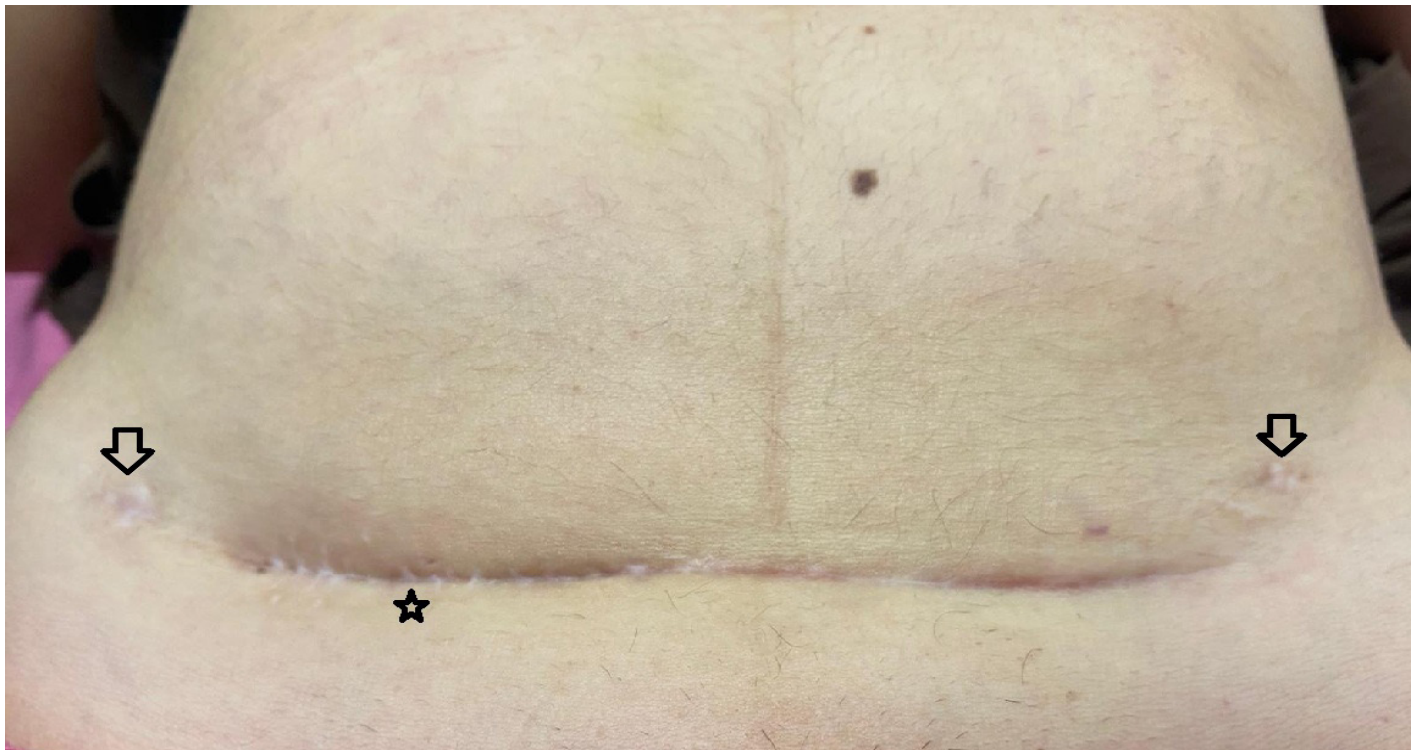


Figure 3. Appearance of the skin incision at 6-month follow-up control. Star indicates the area left for secondary healing. Thick arrows indicate the drain sites.

Discussion

GT and pregnancy present challenges for clinicians. Patient follow-up and delivery carry various risks. Pregnancies with GT have been examined in the literature through case reports and series, and treatment methods have not yet been standardized. In one study, recommendations regarding pregnancy follow-up and delivery in GT cases were published [5]. It was learned that our case was diagnosed with GT at age 9. Flow cytometry studies showed GPIIa 7.7%, IIIa 14.7%, and Ib receptor percentage of 71.0%, while genetic GT typing was not performed. It was learned that the patient had prolonged menstrual bleeding during adolescence that required hospitalization. Additionally, the case was hospitalized during pregnancy with complaints of hematuria and was treated with blood products and Factor VII therapy.

Glanzmann thrombasthenia is divided into three subtypes, and clinical presentation is not dependent on disease severity. Type 1 (severe): <5% of normal GPIIb-IIIa levels, Type 2 (less severe): 10-20% of normal GPIIb-IIIa levels, Type 3 (variant): Normal GPIIb-IIIa levels, but functionally inactive.

It was learned from the medical history that the patient was diagnosed with Glanzmann thrombasthenia at the age of 9.

At that time, genetic typing and antibody screening were not standard clinical practices, so the disease subtype was not determined. Since the patient had not received repeated platelet transfusions that could trigger alloimmunization during her clinical course, anti- α IIb β 3 or anti-HLA antibody screening was also not performed. It was understood from the medical records that treatment decisions primarily prioritized the use of rFVIIa. We planned the delivery process in accordance with current literature recommendations. Accordingly, we performed a planned delivery with a multidisciplinary approach. The case could not achieve delivery through induction and underwent cesarean delivery under general anesthesia. Since we considered the case to be at risk for severe postpartum hemorrhage, surgical preparations were made accordingly.

Immediately before the operation, 1 unit of platelet apheresis was administered to the patient. After delivery of the baby, Factor VII and IV tranexamic acid were administered immediately following cord clamping. A total of 10 ml of Ankaferd was applied into the endometrium. Subsequently, the Kerr incision was closed with locking sutures using No. 1 polyglactin suture. A total of 20 ml of Ankaferd was also applied locally to small bleeding areas on the anterior and posterior surfaces of the uterus. Additionally, topical Ankaferd application was performed subcutaneously.

Ankaferd Blood Stopper (ABS) is a topical hemostatic agent composed of hemostatic herbal extracts. It contains no synthetic additives. It is a hemostatic effective and licensed product approved by the Republic of Türkiye Ministry of Health. ABS (Ankaferd Blood Stopper; patent number 2007-0-114485; Trend Teknoloji İlaç AŞ, İstanbul, Türkiye) is currently available in more than 25 countries [6,7]. ABS is available in sterile solution or gauze-impregnated forms, solution form in 10 mL syringes, and topical forms such as spray [8]. It causes a dark brown or reddish color change at the application site.

Ankaferd Blood Stopper (ABS) is a plant-derived topical hemostatic agent composed of a standardized mixture of *Urtica dioica*, *Vitis vinifera*, *Glycyrrhiza glabra*, *Alpinia officinarum*, and *Thymus vulgaris* [9]. It exerts its effect by interacting with blood proteins to form an encapsulated protein network in which erythrocytes aggregate, thereby contributing to hemostatic control. This mechanism is considered to be largely independent of classical coagulation pathways and may explain its potential utility in patients with impaired hemostasis or coagulation disorders [10–12]. ABS primarily acts through erythrocyte–fibrinogen interactions and induces aggregation via membrane-associated proteins such as spectrin, ankyrin, and actin, leading to the formation of a stable protein scaffold [12]. However, current evidence is mainly based on experimental and limited clinical data, and further studies are required to clarify its clinical efficacy in different settings.

Due to its topical application, it has been used in endoscopic gastrointestinal bleeding and has been reported to provide effective hemostasis in selected clinical settings. Additionally, the rebleeding rate is significantly lower in those who use ABS [13]. Its ability to reduce rebleeding risk has also been demonstrated in other studies [14]. Studies conducted on patients undergoing septoplasty have shown that ABS results in less pain, nasal congestion, sleep and feeding problems, increased comfort, and reduced complication risks [6]. The positive effects of ABS on wound healing have also been demonstrated in experimental and clinical studies [15,16]. With all these properties, ABS may represent a potentially useful adjunctive topical hemostatic agent; however, its independent effect cannot be determined in this case due to the concurrent use of multiple hemostatic interventions. In our study, topical ABS application was performed to the uterus, endometrium, and subcutaneous tissue in light of literature data, and ABS application was repeated after evacuating the subcutaneous hematoma that developed on postoperative day 12. No adverse effects occurred in the patient.

Additionally, during the cesarean operation, we prophylactically ligated the bilateral uterine arteries using the modified O’Leary technique. O’Leary J.L. and O’Leary J.A. (1966) described the technique of bilateral ligation of the ascending branches of the uterine arteries in their article titled “Uterine artery ligation in the control of intractable PPH” [17]. The authors reported that this method, recommended for intractable uterine bleeding, is

more effective than hypogastric artery ligation and offers a much simpler application method. One study indicated that bilateral uterine artery ligation reduces uterine bleeding by up to 90% [18]. We modified this technique as we had previously described [19,20] and ligated the ascending branches of the bilateral uterine arteries with No. 1 polyglactin suture.

In addition, recent literature has emphasized that thrombocytopenia and platelet function disorders during pregnancy require careful differentiation and individualized management strategies due to the potential risk of severe maternal and fetal complications. A comprehensive diagnostic approach, including clinical evaluation and laboratory assessment, is essential to guide appropriate treatment decisions and optimize outcomes. In this context, multidisciplinary planning and close monitoring throughout pregnancy and the postpartum period play a critical role in minimizing bleeding-related complications [21]. Thrombocytopenia during pregnancy may represent a manifestation of an underlying systemic or gestational disorder, and therefore requires careful evaluation and appropriate clinical management to prevent potential maternal and fetal complications [22].

In our own practice, we apply this method in uterine atony, lower segment atony, and resistant bleeding occurring in the lower segment. If we are going to use a balloon tamponade system, we suture the uterine arteries separately as O’Leary and colleagues did. When we do not use a balloon, we ligate the bilateral uterine arteries with a single suture. We make this decision based on the patient’s bleeding status.

The blood products and hemostatic agents administered were consistent with current literature recommendations, including those reported by Fiore et al. (2022) [5]. No life-threatening complications occurred in the postoperative period. The patient developed a subcutaneous hematoma on postoperative day 12, which was successfully managed with evacuation and local measures, including topical ABS application, without further complications. However, as this is a single case report in which multiple hemostatic strategies were applied simultaneously, it is not possible to attribute the observed clinical outcome to any single intervention, including Ankaferd Blood Stopper.

Conclusion

In conclusion, the management of delivery in pregnant women with Glanzmann thrombasthenia requires careful planning and a multidisciplinary approach due to the high risk of hemorrhage. In this case, favorable maternal and neonatal outcomes were observed following a multimodal management strategy, including rFVIIa, tranexamic acid, surgical techniques, and adjunctive topical Ankaferd application. However, as multiple hemostatic interventions were used concurrently, the individual contribution of each component cannot be determined. This case highlights the importance of individualized and proactive management in achieving safe obstetric outcomes in patients with GT.

Patient Consent

Written consent obtained from the patient for publication of this case report. It is available upon request.

Conflict of Interest

The authors confirm the absence of any conflicts associated with this work.

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Presentation

This study was presented as a poster at the 21st National Perinatology Congress, held in İstanbul on April 3-6, 2025.

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