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CASE REPORT
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CASE REPORT: MANAGEMENT OF HIGH-RISK PREGNANCY COMPLICATED BY PLATELET STORAGE POOL DISORDER

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Abstract
This report presents a case of a 25-year-old primiparous woman booked at our Obstetrics and Gynae OPD on 8th week of gestation. Patient was diagnosed with platelet storage pool disorder on history of prolonged bleeding after cut or injury and menorrhagia. The platelet storage pool disorder is a rare condition but if not managed during antenatal period, it may result in fatal outcome for mother and neonate. The patient had a history of spinal surgery for her disc prolapse. Also, she was obese with body mass index 46, so was categorized as high-risk patient. In this case study we describe how patient was managed through an elective and subsequently emergency cesarean section, by the multidisciplinary team planning. It involved obstetric, hematology, and anesthetic teams to find the risk of postpartum hemorrhage and address the patient's complex needs. The surgical procedure was successfully completed with minimal complications, and both mother and neonate had no uneventful outcome. Patient was discharged with tranexamic acid to be taken orally along with subsequent laboratory investigations for follow up. This case highlights how effective is multidisciplinary approach in managing patients with platelet storage pool disorder.

Key words: Platelet storage pool disorder, multidisciplinary, Post partum hemorrhage.

Introduction

Platelet storage pool disorder is a rare coagulation disorder that increases the risk of bleeding. The management of pregnancy in patients with this condition, especially those with other complicating factors such as high BMI and prior spinal surgery, presents significant clinical challenges.

Platelet storage disorder is a condition in which the platelet count is normal, however, in the event of surgery or trauma, there is a significant risk of major bleeding. Sometimes life-threatening event may take place like post-partum hemorrhage. The platelet disorder may be due to the absence or a reduction in the number of dense-granules or a defect in these organelles, or a combination of these two defects.(1)

This case report highlights the plan made for safe pregnancy outcome for mother and fetus. Also, it shows the day-to-day follow-up with antennal scans and hematological lab investigations. The proper management of high-risk case with multidisciplinary approach results in good pregnancy outcome.

Case Presentation

A 25-year-old primiparous woman, G1P0, with a BMI of 46, diagnosed with platelet storage pool disorder. She also had a history of spinal surgery for a disc prolapse two years prior. History of heavy menstrual bleeding, spinal surgery, and no significant family or drug history. Booked at 8 weeks gestation under consultant-led care. Serial growth scans were performed due to her elevated BMI, with normal results. Booking hemoglobin was 119g/L, and platelets were 203 ×10^9/L. Platelet and hemoglobin levels remained stable throughout pregnancy.

Serial obstetric scans indicated normal fetal growth despite technical difficulties due to the patient's BMI. At 31 weeks, a detailed multidisciplinary plan was created to address delivery and postnatal care. Key ultrasound findings included, Fetal growth and anomaly scans confirmed a single live fetus with no major anomalies. Mild polyhydramnios was noted in the third trimester.

The primary concerns were managing the platelet disorder during delivery and managing the high risk of PPH due to obesity and coagulopathy.

A multidisciplinary team comprised of obstetricians, hematologists, anesthetists, and midwives devised a comprehensive plan. Elective cesarean section was planned for 39 weeks. General anesthesia was recommended due to the high BMI and platelet disorder. Regional anesthesia was contraindicated. Preoperative administration of IV tranexamic acid was scheduled from the night before surgery. Platelets were prepared for transfusion, with one unit to be administered 30 minutes before the procedure and a second unit kept on standby. Prophylactic measures for PPH included a bolus of Syntocinon (5 IU) and Synto infusion during the third stage of labor. Tranexamic acid was to be continued postoperatively, initially intravenously and later orally for 10 days. Mechanical thromboprophylaxis was emphasized with early mobilization. At 36+5 weeks, the patient was admitted with preterm premature rupture of membranes (PPROM) and progressed to early preterm labor. The MDT plan was followed closely, and she underwent an emergency LSCS at 36 weeks. Emergency cesarean section was uneventful, with a blood loss of 521 ml. A healthy male baby was delivered with good Apgar scores. The patient was managed with oral tranexamic acid and discharged home on day 3 post-surgery.

The patient's postpartum course was uneventful, and she was discharged on oral tranexamic acid. Hematology follow-up was arranged to monitor her platelet disorder and overall recovery. The post op investigations are shown in table 1.

Discussion

Platelet storage pool disorder occurs because of a lack or malfunction of dense granules. It is only diagnosed by special lab investigations finding low levels of serotonin, nucleotides, and calcium in these granules.(2) Also, by the decreased release of their contents, which results in impaired platelet function and increased bleeding risk. Women with this condition often experience heavy menstrual bleeding and may have severe bleeding after injuries, surgeries, or childbirth.

With advanced diagnostic techniques inherited platelet disorders are being identified more frequently. Although the actual occurrence rate is not fully known, around 30% of women with heavy menstrual bleeding are found to have such disorders.(3) In pregnancy with this condition, peripartum management plans are made by a multidisciplinary team, according to the guidelines for similar bleeding disorders. These plans are done to reduce bleeding risks, like PPH, and delivery associated complications. In cases of severe bleeding, platelet transfusion may be considered.(4, 5)

Patients with platelet disorder are at higher risk, so they need continuous follow-up at specialized centers. Education on preventive measures, and expert guidance for managing bleeding risk are very important.(6) This is especially of concern for women, as they face more frequent bleeding challenges throughout their lives, with symptoms like menorrhagia and impacting their quality of life.(7) In our case the patient had significant history of menorrhagia. Additionally, care for both mother and newborn during delivery is a particularly sensitive matter.(8) Through multidisciplinary approach we planned elective c-section for our patient as cesarean deliveries offer the opportunity to control the bleeding easily. Also the elective cesarean deliveries are generally more controlled procedures than emergency cesarean deliveries, there is more time to maintain hemostasis.(9)

Postpartum hemorrhage may result due to coagulopathy, specially in women with previous familial history or history of heavy menstruation.(10) In our case report patient did not developed PPH and her pregnancy outcome was good with minimal blood loss. None of the study so far relate obesity with platelet pool disorder. Although platelets has their role play in improved cardiometabolic risk with weight reduction.(11)

The platelet count remained within a normal range throughout antenatal and postnatal period. As the platelet count remain normal in platelet delta granule storage pool deficiency. PD is an underdiagnosed condition caused by decreased numbers of platelet dense granules and is best diagnosed by electron microscopy.(12) The tranexamic acid is treatment of choice in PPD to prevent from post-surgical bleeding, menorrhagia and other bleeding complications.(13)

Conclusion

This case shows the challenges during delivery due to high risk of platelet storage pool disorder and high BMI in pregnancy. The proper management, careful anesthetic planning, and a collaborative multidisciplinary approach is important in managing the case. This case also shows the importance of prompt adjustment to the MDT plan in PPROM and preterm labor. The successful management of PPH risk using prophylactic tranexamic acid and appropriate intraoperative care resulted in a positive outcome for both the mother and baby.

Table 1: The pre-operative and post-operative lab values for hemoglobin (Hb), red blood cells (RBC), hematocrit (Hct), platelet (PLT), and liver function tests (LFTs):

Parameter	Pre-Operation	Post-Operation
Hemoglobin (Hb)	105 - 148 g/L	94 - 100 g/L
Red Blood Cells (RBC)	3.45 - 4.65 x10^12/L	3.07 - 3.25 x10^12/L
Hematocrit (Hct)	0.33 - 0.44 L/L	0.30 L/L
Platelets (PLT)	173 - 209 x10^9/L	168 - 207 x10^9/L
LFTs (Bilirubin)	4 umol/L	-
LFTs (Protein)	58 g/L (Low)	-
LFTs (Albumin)	25 g/L (Low)	-
LFTs (Globulin)	33 g/L	-
LFTs (Alkaline Phosphatase)	122 U/L	-

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