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Against all Odds; Acute Deep Vein Thrombosis with Consumptive Coagulopathy for LSCS

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KEYWORDS

Deep vein thrombosis, pregnancy, HELLP syndrome, anesthesia, inferior vena cava filter, cesarean section, coagulopathy

ABSTRACT:

Background: Deep vein thrombosis (DVT) associated with consumptive coagulopathy is a very rare coexistence which poses significant risks to both the mother and fetus during pregnancy. It can cause significant hypoxemia and hemodynamic instability due to pulmonary embolism. Prompt treatment with anticoagulants and mechanical filters is essential to prevent progression and embolisation of complex deep vein thrombosis. Multidisciplinary team planning is essential for execution of safe operative delivery balancing the risks of intraoperative bleeding versus pharmacological anticoagulation. We describe the intraoperative anesthetic management of a 34 week pregnant woman with acute bilateral DVT, altered liver function and consumptive coagulopathy for cesarean section.

INTRODUCTION

Acute deep vein thrombosis (DVT) during pregnancy is a rare but serious event resulting from physiologic hypercoagulability, venous stasis, and vascular endothelial injury. It carries the risk of pulmonary thromboembolism which can be detrimental to the mother, demanding timely initiation of intravenous or subcutaneous anticoagulants.[1];[2]. But the coexisting comorbidities especially HELLP syndrome and liver dysfunction can further complicate the coagulation status of the mother. They reset the coagulation system in the mother resulting in increased bleeding tendencies along with thrombosis. The anaesthetic management demands meticulous planning focusing on measures to counter hypoxemia, massive blood loss, hemodynamic instability and maternal and fetal well being.[3], [4]

CASE REPORT

A 23-year-old primigravida at 34 weeks of gestation, weighing 80kgs presented with bilateral lower limb swelling and pain of two days duration. Doppler ultrasound revealed acute thrombosis involving common femoral, superficial, deep femoral, and posterior tibial veins . On examination Heart rate was 88 beats per minute, respiratory rate was 18/minute, blood pressure was 120/70 and SpO2 was 98% on room air. Laboratory findings showed elevated liver enzymes, fibrinogen levels of 65.2mg/dl (**TABLE 1).** Due to coagulopathy and renal impairment, intravenous anticoagulation was not instituted.

ECG showed normal sinus rhythm with no T wave changes and right ventricular hypertrophy and echocardiography demonstrated normal cardiac function with an ejection fraction of 63%,there was no right atrial and right ventricular dilatation or hypertrophy. The D dimer value was 22.62 and NT Pro BNP was 189.20. The cardiologist and the vascular surgeons suggested placement of IVC filter prior to operative delivery to minimize the risk of pulmonary embolism and a single dose of unfractionated heparin 5000 IU was given. The hematologist advised close coagulation monitoring and staged anticoagulation medications.

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Investigations comparing preoperative and postoperative values are summarized below:(**TABLE 1)**

Parameter	**Preoperative**	**Postoperative (Day 0)**	**Postoperative (Day 1)**	**Postoperative (Day 2)**	**Reference Range**
Hemoglobin (g/dL)	12.2	10.2	6.9	8.2	12-16
Platelet count (lakhs/mm³)	1.23	1.55	0.77	0.86	1.5-4.5
PT (seconds)	15.4	15.4	Na	15.8	10-14
INR	1.38	1.38	Na	1.42	0.8-1.2
PTT (seconds)	39.8	49.6	Na	40.5	25-35
Serum fibrinogen (mg/dL)	65.2	50.4	91.4	146	200-400
SGOT (U/L)	305	204	122	Na	10-40
SGPT (U/L)	330	240	148	Na	10-45
Total bilirubin (mg/dL)	8.04	7.45	7.34	Na	0.3-1.2
Creatinine (mg/dL)	2.1	1.1	2.2	2.3	0.5-1.2

The patient was explained about the high risk of bleeding, need for intraoperative multiple blood transfusions and the possibilty of pulmonary thromboembolism demanding ventilatory care and emergency thrombectomy prior to procedure. Four units of packed red blood cells, four units of fresh frozen plasma, one unit of single donor platelet, and two units of random donor platelet were prepared as standby for anticipated intraoperative bleeding. Aspiration prophylaxis with Injection Pantoprazole 40mg and Injection Perinorm 10 mg was given 30 minutes prior to shifting to OR. The patient was shifted to the operating theatre where standard ASA monitors were connected. A 16 gauge intravenous line was secured. An arterial line was secured under local anesthesia to facilitate invasive blood pressure monitoring. Under local anesthesia vascular surgeons inserted the mechanical IVC filter via the internal jugular vein. Following preoxygenation for 3 minutes, rapid sequence induction done with propofol 2mg/kg and airway secured with 7.5 sized ETT following succinylcholine 1.5 mg/kg. The anesthesia was maintained with 50% nitrous oxide and oxygen and sevoflurane at a MAC of 0.5-0.7%.

Two units of fresh frozen plasma and 1 unit of packed cells were transfused intraoperatively inview of low fibrinogen levels. The patient was shifted postoperatively to the critical care unit for mechanical ventilation and monitoring. Postoperative management included initiation of IV heparin for anticoagulation. Two units each of fresh frozen plasma and packed red cells were transfused to correct coagulopathy and anemia with serial monitoring of coagulation parameters and hemoglobin. The patient was extubated on postoperative day 2 and discharged in a stable condition on postoperative day 10.

DISCUSSION

Pregnancy-associated deep vein thrombosis (DVT) is a rare but potentially life-threatening complication due to the hypercoagulable state induced by pregnancy alongside venous stasis and endothelial injury.[1,5,6,7] The coexistence of altered liver function, low fibrinogen levels and raised creatinine levels in our patient complicates the clinical diagnosis as HELLP syndrome along with deep vein thrombosis. It increases the risk for hypoxemia, pulmonary embolism and massive bleeding intensifying the challenges for the anesthesiologist.[2,8] In this context, the anesthesiologist plays a pivotal role in formulating a tailored perioperative plan to minimize hemorrhagic complications while maintaining maternal and fetal hemodynamic stability. Careful preoperative evaluation including coagulation studies, liver and renal function tests is crucial to guide timing and choice of anesthetic technique. Neuraxial anesthesia is generally

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favored for cesarean section due to favorable maternal and neonatal outcomes.[9] Since the need for perioperative and postoperative heparin was present in our case we avoided spinal anesthesia. Additionally our patient had low fibrinogen levels which increases the risk of uterine atony and massive bleeding. When anticoagulation is contraindicated because of severe coagulopathy, or ineffective due to extensive thrombosis, mechanical interventions such as inferior vena cava (IVC) filter placement become necessary for pulmonary embolism prophylaxis.[10,5] Placement under local anesthesia avoids systemic effects and allows maintenance of spontaneous ventilation, critical in coagulopathic and hypoxemic patients. In our case, the filter placement under ultrasound and fluoroscopic guidance provided a vital safety net before an urgent cesarean section. Intraoperative management demands invasive monitorization with arterial and central venous catheters to closely observe hemodynamics and volume status, allowing timely intervention against hypotension, hypoxemia, or bleeding. Rapid sequence induction and intubation mitigate aspiration risks in the parturient with a presumed full stomach and compromised respiratory reserve due to pulmonary vasculopathy and DVT-related hypoxia.[11,12] Drug selection is tempered by hepatic dysfunction, emphasizing agents with rapid metabolism and minimal hepatic toxicity such as propofol and fentanyl. Maintaining blood pressure within 20% of baseline is critical to prevent cerebral complications when concurrent intracranial vascular malformations are present, mirroring principles derived from arteriovenous malformation anesthesia literature.[4,5,6] Blood product availability including fresh frozen plasma, packed red blood cells, and platelet concentrates preoperatively is indispensable due to unpredictable bleeding risks in DIC, coagulopathy of pregnancy, and surgical bleeding. The intraoperative transfusion threshold must be finely balanced against thrombosis risks, requiring close liaison with hematology consultants.[3,13] Postoperative hemodynamic and respiratory support in critical care, including ventilation and anticoagulation reinitiation, is paramount for optimizing recovery and minimizing thromboembolic and hemorrhagic sequelae. Multidisciplinary collaboration among anesthesiology, obstetrics, vascular surgery, hematology, and neonatology facilitates comprehensive management, from preoperative optimization to postoperative surveillance, underscoring the indispensable role of synchronized teamwork in successful outcomes.[13,14]

CONCLUSION

This case exemplifies the complexity of managing pregnancy-associated acute DVT complicated by HELLP syndrome and DIC, requiring sophisticated anesthetic and multidisciplinary strategies. Mechanical embolic protection by IVC filter placement under local anesthesia followed by well-monitored cesarean section under general anesthesia with invasive monitoring ensured maternal and fetal safety. Individualized anesthetic plans emphasizing coagulation optimization, meticulous perioperative monitoring, and proactive transfusion facilitated a favorable maternal and neonatal outcome. Early recognition, timely intervention, and multidisciplinary coordination remain the cornerstones in managing such high-risk obstetric thrombotic emergencies with challenging coagulopathy.

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