

Challenges in Managing a Pregnant Patient for Cervical Cerclage with a History of Liver Disease: The Use of Ultra Low-dose Spinal Anaesthesia

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Pregnancy-induced liver disease is an infrequent occurrence, though a number of liver diseases may appear in pregnancy. Hyperemesis Gravidarum, affecting 0.3-2% of women in the first trimester of pregnancy, is one such disorder. The less common (<1%) but identified liver-related disorders include Haemolysis, Elevated Liver Enzymes and Low Platelet (HELLP) syndrome, acute fatty liver disease of pregnancy, and intrahepatic cholestasis of pregnancy, which are seen in the second and third trimesters, respectively [1].

Herein, this report presents the case of a 26-year-old female patient who was gravida two (G2) with a previous abortion (A1) three years ago, at an estimated gestational age of 23 weeks and six days. The patient was referred to our institution due to cervical incompetence. Her medical history revealed significant findings from two years prior when she was admitted with symptoms of haematuria, early satiety, fatigue, and splenomegaly. At that time, laboratory assessments showed pancytopenia, with haemoglobin at 8.4 g/dL and the platelet count at 53,000/cu.mm. The bilirubin and the liver enzymes were within normal limits. Hence, a diagnosis of portal hypertension with symptomatic hypersplenism was made.

Subsequent surgical intervention included an open splenectomy that found a cirrhotic liver with peri-splenic, peri-hepatic, and retroperitoneal collateral circulation, along with an enlarged and congested spleen. The surgical procedure and the anaesthesia administered as per the records were uncomplicated.

For the current admission, a preoperative assessment was carried out. Vital signs included pulse rate at 98 beats per minute, blood pressure at 100/70 mm Hg, and oxygen saturation at 100% on room air. Cardiovascular examination identified a systolic murmur, but assessments were normal for the respiratory and central nervous systems. Abdominal palpation indicated the presence of foetal movements. The laboratory tests proved that the patient was anaemic with a haemoglobin level of 9.9 g/dL, hypoalbuminaemic at 2.8 g/dL, and had a coagulopathy with an International Normalised Ratio (INR) of 1.79. The patient underwent further investigations, which included an Electrocardiogram (ECG) and an Echocardiogram (ECHO). ECG demonstrated a normal sinus rhythm with no abnormal changes. ECHO revealed an ejection fraction of 62% and a pulmonary artery systolic pressure of 40 mmHg with mild Aortic Regurgitation (AR) on observation. The renal function tests and blood gases were normal.

Since she had a Mallampati score of IV, regional anaesthesia was selected, considering her antenatal condition, posted for cervical cerclage. She was therefore planned for a central neuraxial block, in which a subarachnoid block was preferred as a mode. The semi-emergency status of the case required urgent optimisation. The obstetric team was advised to correct the coagulopathy with an intravenous administration of Vitamin K (10 mg), which was repeated six hours later. Subsequent coagulation profiles two hours after the second dose demonstrated an INR value of 1.2.

With routine ASA monitors, a single attempt was made for a subarachnoid block at the interspace L2-L3 by inserting a 27-gauge Quincke spinal needle. The anaesthetic mixture consisted of 0.5 mL of 0.5% heavy Bupivacaine and 25 mcg of fentanyl (total of 1.0 mL). Two minutes post-injection, a sensory block level of T12 was reached, enabling an uneventful procedure, completed without haemodynamic disturbances.

In a normal pregnant population, decreases in liver enzymes and serum albumin to levels of 2.3-4.2 g/dL are anticipated. In the presence of liver pathology, one may also anticipate hyperbilirubinaemia and additional hypoalbuminaemia. Additionally, thrombocytopenia and decreased production of coagulation factors can cause prolongation of Prothrombin Time (PT) and Activated Partial Thromboplastin Time (APTT). Hepatic encephalopathy is also a possible complication. They could present as a hypo-coagulable state or even hyper-coagulable, hence the possibility of active bleeding when procedures are done and even after that risk in terms of developing DVT or pulmonary thromboembolism [2]. In this case, the APTT was normal, while prolonged INR was responsive to vitamin K, as an element of cholestasis might be present.

The central neuraxial blockade techniques are usually contraindicated in patients with an anticoagulation status reflected by an INR of more than 1.5, which is associated with a higher risk for the formation of epidural haematomas [3]. In those cases where general anaesthesia is necessary, low serum albumin may interfere with the metabolism and elimination of drugs and thus increase the concentration of unbound anaesthetic agents. The patient had a difficult airway, especially in the antenatal period, which was another reason to go with a neuraxial blockade. As the case was not highly emergent and an improvement with IV vitamin K was evident [4], fresh frozen plasma was not considered.

Ultradose with 3.75 mg of bupivacaine is being administered successfully for lower segment caesarean sections [5], where the level needed may be up to T6. There are studies with low doses, but they are usually 5 mg or above [6,7]. The authors gave only 2.5 mg in this antenatal case as the surgery needed a low level of T12 to ease the positioning of lithotomy. Peterson Soares Santos R et al., have used a similar dose of 2.5 mg of the drug for perineal surgeries effectively. The nomenclature of low, very low and ultra-low dosage is not very clear [8]. Any dose equal to or less than 2.5 mg of hyperbaric bupivacaine is considered ultra-low dosage. Pudendal nerve block [9] with or without the use of ultrasound has been described for the case, and it could be the authors' alternate plan.

Thus, the management of a surgical case involving a pregnant patient with a history of liver disease requires quick optimisation of INR values, with a very low dose of intrathecal local anaesthetic bupivacaine.

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