

Anesthesia for a Jehovah's Witness with Critical Anemia from Ruptured Stomach GIST

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ABSTRACT

We report a case of a female Jehovah's Witness admitted to the hospital with concealed rupture of stomach gastrointestinal stromal tumor (GIST) and scheduled for exploratory laparotomy with tumor removal. She was critically anemic and refused to receive all kinds of blood or blood products. We present anesthesia techniques to avoid blood transfusion in this patient, which include deliberate hypotension and acute normovolemic hemodilution.

Keywords: Jehovah's Witness, peri-operative, blood conservation

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The Jehovah's Witness has long time been challenging from an anesthetic point of view in terms of patient's belief, patient's right, ethical concern, legal and medical issues.^{1,2} There are about 4,000 Jehovah's Witness population in Thailand. They refuse to receive all kind of transfusion of blood and blood products, they also refuse to receive their own blood when it was disconnected from their body, even in the life-threatening situation. The problem is more pronounced when the patient is already anemic and the operation is expected to produce a fair amount of blood loss.

CASE REPORT

Pre-operative period

A 49-year-old female Jehovah's Witness presented with progressive abdominal distention within 1 month. She had well-controlled hypertension. The initial physical examination revealed markedly anemic conjunctiva and distended abdomen with palpable mass sized 10 cm at the left upper quadrant. The patient was not dyspnea and was able to lie flat. The primary investigation showed the hemoglobin of 3.9 g/dl and hematocrit 12.5% with normal coagulogram. The CT scan showed a large mixed solid and cystic mass at the pancreatic tail displacing the spleen, stomach and right kidney with free fluid in the abdominal cavity. A concealed rupture of stomach gastrointestinal stromal tumor (GIST) was suspected. She had been admitted to observe clinical

signs of bleeding tumor and raise hemoglobin before the surgery. The patient refused to receive all kinds of blood or blood products due to religious beliefs. After the risks and benefits of blood conservation techniques were discussed, she was given erythropoietin 10,000 units subcutaneously every other day for 2 weeks. In the mean time, she was given Venofer (iron sucrose injection) 200 mg intravenously once daily as well as oral ferrous sulfate and folic acid. The hematocrit was 29.4% after 2 weeks therapy and the patient was scheduled for tumor removal.

Intra-operative period

The epidural catheter was placed at the T9-10 level and general anesthesia with endotracheal tube was induced uneventfully using thiopentone, fentanyl, midazolam and atracurium. Two large bore intravenous lines provided access as well as an arterial line and central venous catheter. The acute normovolemic hemodilution was commenced to get 2 bags of 350 ml blood without disconnecting of the tubing from the patient while volume replacement with crystalloid and colloid was initiated. Her hematocrit was 21% after the blood collecting was done. Deliberate hypotensive technique was conducted by using a combination of epidural solution (0.25% Bupivacaine with fentanyl 2.5 mcg/ml) and inhalation anesthetics (isoflurane) to keep the mean arterial pressure at 50-70 mmHg. The tumor was removed with partial gastrectomy and distal pancreatectomy. The total anesthesia time was 3 hours and 30 minutes with estimated blood loss of 2,500 ml, the lowest hematocrit during the operation was 17%. Both

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units of collected blood were been given back to the patient. The hemodynamic parameters were stable without intraoperative acidosis and the urine output was 50-100 ml/hour. The patient was extubated and transferred to the intensive care unit post-operatively.

Post-operative period

The immediate hematocrit was 22.5% and the postoperative course was uneventful. Her hematocrit was 39.7% after 1-month follow-up with oral iron supplement.

DISCUSSION

We successfully raised hemoglobin in the limited preoperative time with the combination of erythropoiesis-stimulating agents and iron supplementation, using both intravenous and oral routes, to prepare the patient for the operation. This combination is effective and safe to use in acute blood loss, especially when the blood and blood product is unacceptable in this patient.³

To reduce intra-operative blood loss, we used acute normovolemic hemodilution (ANH), which is a simple, efficient, and cost-effective technique.⁴ It comprises collecting the patient's blood using a collecting bag with anticoagulant, replace with crystalloid and colloid to maintain organ perfusion and give the blood back to the patient when the operation finishes. When the red cell mass is reduced, the entire red cells loss is hence reduced.^{5,6} In this patient, after the process of blood collection was done, the tube was still connected to the patient's circulation, to meet the patient's desire, until returning blood to the patient.

Deliberated hypotension was also applied intra-operatively. This can be done by anesthetic agents such as propofol and inhalation anesthetics, vasodilator such as nitroglycerine and nitroprusside, as well as epidural

anesthesia.^{7,8} Close monitoring of vital signs and signs of adequate organ perfusion e.g. adequate urine output and unchanged serum lactate level are crucial. In this patient, we used inhalation anesthetics and epidural local anesthetic to lower the blood pressure, which are easy to titrate with little side effect.

To summarize, we successfully raised hemoglobin in the limited pre-operative time with the combination of erythropoiesis-stimulating agents and iron supplement to prepare the patient for the operation. The induced hypotension and acute normovolemic hemodilution were used to decrease the intra-operative blood loss. There was no complication and the patient returned home safely.

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