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Case Report

Conservative Blood Management and Anesthetic Considerations a Jehovah's Witness Patient Undergoing Pancreatoduodenectomy. A Case Report

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Abstract:

Major surgery in a Jehovah's Witness patient represents a challenge for the anesthetic and surgical team not only because of the ethical dilemma, but also because it creates a major obstacle to the rapid control of hemorrhage in a surgical setting. We present a case report of a pancreatoduodenectomy in a Jehovah's Witness patient who refused to be transfused with the use of the principles of bloodless surgery and maintenance of cell savage as a backup, if necessary. The advances in our understanding of hemostatic agents and available techniques for managing patient bleeding represent options for avoiding blood transfusion in this patient population and all patients undergoing major surgery

Key words: jehovah's witness; anesthesia; blood conservation; transfusion; cell salvage

Introduction

The Jehovah's Witness (JW) is a Christian religion that believe that life, which is held as sacred is represented by the blood, thus blood acquires a sacred status. The believe that taking into their bodies, the blood of another creature violates biblical law. The prohibition of blood transfusion is a deeply held core value and is a sign of respect for the sanctity of life [8]. The beliefs of the JW are based on their interpretation of biblical passages that transfusion of whole blood, packed red cells platelets and plasma are unacceptable health treatment. Depending on individual interpretation, transfusion of secondary blood components such as albumin, cryoprecipitate, clotting factors and erythropoietin may be allowed. Many JW also accept acute normovolemic hemodilution and cell salvage machines if the apparatus maintain the continuity of the drainage with the circulation [6]. Blood conservative methods consist of techniques that minimize blood loss and improve patients' own supply with better outcomes and it should be the first effort during any surgery, especially in Jehovah's Witness [9].

The present case illustrates a successful pancreatoduodenectomy surgery in a patient who refused to be transfused and highlighted the complexity in a case of a major surgery with bleeding potential in a Jehovah's witness patient.

Case Report

R.P.S., 70 years old, Jehovah witness, female, Brazilian, 40 kg, 1,50m, diagnosed with pancreatic adenoma presented herself for tumor resection and pancreatoduodenectomy (Whipple surgery). Once proposed for surgery, patient firmly deny the possibility to receive transfusions of whole blood, packed erythrocytes, platelets and plasma. She also rejected auto transfusion with blood pre-deposit. She accepted the use of pro-thrombotic drugs such as Tranexamic Acid, plasma derived fractions such as Albumin and

Cryoprecipitate and the use of intraoperative blood conservative techniques as cell salvage and acute normovolemic hemodilution. Preoperative laboratory test showed hemoglobin of 12,3 g/dl with no B12 or iron deficiency.

She was continuously monitored with cardioscopy, peripheral oxygen saturation, invasive blood pressure and bispectral index. A 16G vein catheter was inserted and she was sedated with midazolam 5mg. An epidural anesthesia was performed at T10-T11, using loss of resistance technique, 10ml of 0,2% ropivacaine was injected with 2mg morphine. An epidural catheter was introduced and maintained in the postoperative period. Anesthesia induction and maintenance was performed with continuous infusion of remifentanil (0,2mcg/Kg/min), propofol 2,5mg/kg, Ketamine 0,3mg/kg, Rocuronium 0,6mg/kg and Lidocaine 1mg/kg. A central venous catheter was placed in the right jugular vein with ultrasound guidance and left radial artery cannulation was performed. A Flotrac® was used to calculate the cardiac output and stroke volume, using a left radial arterial line. The systemic vascular resistance could be calculated from the values of

central venous pressure (CVP), cardiac index and invasive blood pressure. Tranexamic acid 10 mg/kg was administered before the incision.

During surgery, no major bleeding was observed. 3000ml lactated ringer's solution and norepinephrine solution 0,05mcg/kg/min were administrated in order to maintain a normal hemodynamic status. Care was taken during the procedure to maintain immobility, normothermia, stable blood pressure and euvolemic state. As there was no profuse bleeding, the cell salvage did not need to be used. Postoperative analgesia was granted by ropivacaine continuous infusion via epidural catheter.

Discussion

JW are a religious group that do not accept blood transfusion in any manner, even in life threatening situation and so, it become a dilemma for surgeons and anesthesiologists in surgeries with the possibility of substantial blood loss. It is possible to carry out major surgeries without receiving blood with optimum preoperative preparation, meticulous and fast surgery and adequate monitoring [5]. Numerous strategies and technologies allow the reduction of blood product transfusion. Before surgery, a meticulous coagulopathy research and hemodynamic optimization are useful to prepare the patient for surgery tranexamic acid intraoperatively has been reported to reduce blood loss and for that, can be beneficial for JW patients [8].

One of the most important intraoperative blood conservation techniques is the autologous cell salvage, a strategy in which perioperative team collects blood lost on the surgical field and prepares it for transfusion back into the patient. The process begins with aspiration of blood, citrate or heparin is added to prevent clotting, until the moment of separation and washing of the red blood cells (removal of anticoagulant, free hemoglobin and cellular debris). Finally, the solution is centrifugated and a packed red blood cells from autologous blood is produced [6] [1].

Cell Saver is one of the main techniques used to reduce the need for allogeneic blood transfusion in major surgery. The National Institute for Health and Care Excellence (NICE) recommends the use of a cell saver in surgeries if is expected a blood loss greater than 500 ml, such in major cardiac, vascular, urologic surgeries, thoracic surgery, abdominal and pelvic trauma, transplants, obstetric and orthopedic surgery. In addition, it can also be considered in the presence of coagulopathy, in patients with rare blood type or multiple erythrocyte antibodies, and when the patient refuses allogeneic blood transfusion [4]. Wang et al demonstrated the benefits of autologous cell salvage during cardiac surgery. The authors concluded that autologous cell salvage reduced red blood cell transfusion [5]. A 2010 systematic review that pooled 75 clinical trials, including orthopedic, cardiac, and vascular surgery, showed a 21% reduction in the use of allogeneic blood. In 2015, a Cochrane systematic review found a reduction in transfusion of 4.7 units of blood [2]

Situations such as infection, potential for contamination and the presence of tumor cells in the blood collected must be evaluated on a case-by-case basis and therefore constitute relative contraindications [4,5] Autologous cell salvage is controversial in cancer surgery due to the possibility of dissemination of malignant cells. However, recent developments such as leukocyte depletion filtering and blood irradiation may remove the contaminating tumor cells and had shown to be safe and efficacious in oncologic surgeries [3]. Moreover, it is well known that metastatic process is not simple and require adequate number and viability of circulating tumor cells. [7] supported that the salvaged blood is devoid of tumor cell and safe for transfusion. The authors found that the fewer tumor cells in the filtered salvaged blood is significantly lower than the number of circulating tumor cells in the patient own blood. Tumor cells in the salvaged blood are not as potent as in the circulating blood and that is why it is incapable of metastatic seeding. During the filtration steps, the tumor cells membrane loses their integrity, become dysfunctional with no replicative capacity [7].

Although we did not used the cell salvage in this case, this approach potentially could be used in a JW patient to reduce transfusions, particularly during profuse bleeding. Patients who received salvaged blood had no significant difference in distant metastasis rate or tumor recurrence compared to those who received other forms of blood transfusion [4,5]. Overall, salvaged blood in cancer patient should be considered as an alternative to avoid blood transfusion and consequently, the potential risks related to blood transfusion, i.e., immunomodulation, infections and transfusion reaction [2].

Conclusion

Major surgery in a JW patient requires exceptional perioperative management and monitoring as it can last long and may involve significant blood loss. JW patients should not be rejected, but adequately counseled for the successfully of the procedure. In addition, blood supplies could be not always available and present high cost. Strategies to avoid transfusions are therefore desirable. These principles are likely to gain popularity and become standard practice for all patients.

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