PLATELET TRANSFUSION IN A PATIENT WITH THROMBOTIC THROMBOCYTOPENIC PURPURA PRESENTING FOR SPLENECTOMY

- A Case Report -

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Introduction

Thrombotic thrombocytopenic purpura is a rare disease with an incidence of 3-7 cases per million[1] and consists of thrombocytopenia, microangiopathic hemolytic anemia, neurological impairment and renal failure. The recent speculation of its pathogenetic mechanism is focused on the deficiency of Von Willebrand factor-cleaving metalloprotease activity[2,3].

Although plasma exchange is considered the treatment of choice, relapse of the disease is not uncommon[4]. Splenectomy has been proposed to reduce the relapse rate[5] and it is not uncommon for the anesthesiologist to be confronted with such a patient. Presentation of the following case sheds light into the clinical considerations concerning anesthesia.

Case Report

A 62-yr-old, 56-kg, 1.60 m male, presented with a relapse of known Thrombotic Thrombocytopenic Purpura (TTP), with a platelet count

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of 4000x $10^3/mm^3$ resistant to therapeutic measures of γ-globulin and high dose dexamethasone (100 mg/day). Since thrombocytopenia failed to resolve, splenectomy was scheduled. From his medical record, TTP presented for the first time in 1993 and he had another two relapses since (1996 and 2003) which responded in high dose dexamethasone.

Preoperative findings consisted of arterial blood pressure of 140/80 mmHg, heart rate 90/min, petechia in the upper and lower limbs. The patient was treated for arterial hypertension with 5 mg amlodipine twice daily per os.

Relevant preoperative laboratory findings were: Hemoglobin 10.4 g/dL, Hematocrit 30.8%, Prothrombin Time (PT) 10.5 sec, Partial Thromboplastin Time (PTT) 20.1 sec, Creatinine 1 mg/dL, Blood Urea Nitrogen 83 mg/dL.

Before entering the operating room the patient was transfused with 3 units of platelets. In the operating room, the standard monitors attached were [electrocardiogram, noninvasive blood pressure measurement, pulse oximetry, end-tidal carbon dioxide concentration, inspired and expired sevoflurane concentrations (Capnomac Ultima TM, Datex-Ohmeda, Helsinki, Finland)]. Consideration was taken to protect all possible pressure points which were padded carefully. After placement of an intravenous catheter 18 G, hydrocortisone 100 mg, metoclopramide 10 mg, ranitidine 50 mg and 1 mg midazolam, were given.

Anesthesia was induced with 200 mg propofol, 100 mg thiopental and 9 mg cis-atracurium facilitated endotracheal intubation with an 8.0 endotracheal tube. Anesthesia was maintained with O_2/N_2O, sevoflurane 1.5%, fentanyl 300 μg, and cisatracurium 4 mg. A nasogastric tube was placed atramautically at the beginning of the procedure. Vital signs remained stable throughout the procedure. Towards the end of the operation, diffuse oozing was noted by the surgeon at the operative side and the patient was transfused with 1 unit of platelets, 4 units of FFP and 1 unit of red blood cells. At the end of the procedure 10 mg of morphine and 4 mg of ondansetron were given in small increments as well as 45 μg clonidine IV allowing smooth extubation of the trachea without hemodynamic

exacerbation. The patient was lying comfortable and painless; nevertheless he was transferred in the Intensive Care Unit.

Immediately postoperatively hemoglobin was 10 mg/dL, platelet count was 22000x10^3/mm^3, PT 11.8 sec, a PTT 22.2 sec. The following day the patient was transferred to the ward. Five days later his platelet count was progressively increased and he left the hospital.

Discussion

Splenectomy has been used as a rescue solution for refractory cases of TTP and may reduce the risk of relapse episodes[6]. Anesthetic considerations in those patients who require urgent surgery focus on the disease itself and on therapeutic treatments.

Platelet and complete blood count properative profile and biochemical markers are important, as well as clinical evaluation of the CNS and renal system. Besides the basic therapeutic treatment which is plasmapheresis, those patients are treated also with corticosteroids[7] and perioperative supplementation due to suppression of the pituary adrenal axis is necessary. Exogenous corticosteroid therapy is associated with myopathia therefore muscle relaxants must be given cautiously. Patients who receive γ-globulin[8] or cyclosporine[9] are at increased risk of infections and aseptic techniques must be applied. Vincristine[10] given in refractory cases is associated with peripheral neuropathy and clinical signs should be sought preoperatively.

In general, platelet transfusions are contraindicated in such patients[11,12] except if they manifest signs of hemorrhage. Although in a small series of patients there were no adverse effects in patients receiving platelet transfusions before invasive procedures[13]. Nevertheless there are no guidelines for treating preoperatively such patients and an open abdominal operation is a challenge and might be complicated with major bleeding. We decided to transfuse the patient immediately preoperatively because open splenectomy was planned instead of minimal invasive surgery and also postoperatively because of diffuse oozing noted by the surgeon towards the end of operation. Our patient did not deteriorate the following days

and this is in accordance with other case reports where deterioration after platelet transfusions in those patients was not observed[14,15].

In the operating theatre positioning of the patient should prevent any pressure areas. Central catheterization should be avoided if possible because of increased bleeding risk which might prove fatal especially in the subclavian approach[16]. Peripheral vascular access with large cannulas is preferable instead. Arterial catheterization was also avoided in our patient for the same reason.

Airway management must proceed gently because of increased bleeding risk. Sympathetic reflexes should be well controlled during induction and maintenance of anesthesia because of the increased risk of intracranial hemorrhage in those patients[17]. In vitro studies showed an enhanced blood inodolysis with propofol[18] and reduced platelet adhesion[19] but not in concentrations used clinically. We choose propofol only for induction in addition to thiopental to reduce the upper airway reflexes even further[20]. Anesthesia was maintained with sevoflurane for which available data has been shown to both enhance[21] and reduce platelet adhesion[22] in vitro studies, while cis atracurium is not known to interfere with platelets.

Our patient had an uncomplicated recovery after splenectomy despite the low preoperative platelet count and the platelet transfusion he underwent perioperatively. Dealing with patients suffering from TTP who present for splenectomy, is not an easy task for the anesthesiologist. A careful anesthetic plan must be formed based on all clinical and laboratory aspects. Platelet transfusion must be individualized considering the risks and benefits of such a manoeuvre.

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