

## Case Report

# Perioperative Anaesthetic Management of a Patient with relapsed Aplastic Anaemia

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### Abstract

Aplastic anaemia occurs due to failure of blood cell production by bone marrow. All blood cell counts are low. Untreated patients may die within one year mainly due to uncontrolled infection due to neutropenia. Anaemia and thrombocytopenia cause troublesome symptoms and necessitate frequent red cell and platelets transfusions. Surgery poses a very high risk for these patients because of the several complications that can occur in the perioperative period. In this paper we report on a patient with relapsed aplastic anaemia who was optimized preoperatively and underwent a total abdominal hysterectomy under general anaesthesia.

### Introduction

Aplastic anaemia is defined as the presence of pancytopenia in the peripheral blood and a hypocellular marrow in which normal haemopoietic marrow is replaced by fat cells.<sup>1</sup> It occurs due to failure of blood cell production by the bone marrow.<sup>2</sup> Typically all blood cell counts are low. Because of the deficiency of haemopoietic cells, the patient is at a risk of several complications. Neutropenia leads to a high risk of infection. Thrombocytopenia causes bruising and spontaneous bleeding and moderate to severe anaemia is usual due to the decreased number of circulating red cells.<sup>1-3</sup> These risks are increased several fold in the perioperative period and any surgical intervention in these patients should be undertaken only after careful contemplation and

weighing the balance between risks and benefits of the surgery.

We report on a patient with relapsed aplastic anaemia who presented with menorrhagia, failed to respond to conservative management and underwent total abdominal hysterectomy under general anaesthesia.

### Case Report

A 35 year old woman, known case of idiopathic aplastic anaemia since 2000, presented with a history of menorrhagia for several months. The patient had received Antilymphocyte Globulin and remained in remission until September 2001, but then relapsed. Since then she had been receiving packed red cells and platelet transfusions every 7-10 days. She was also receiving cyclosporine. Because of the high risk of surgery she was put on conservative management for her menorrhagia. The haematologist's advice was to perform surgery only as the last resort. Her menorrhagia did not respond to conservative management and a total abdominal hysterectomy was planned. The patient was very emotionally disturbed by her symptoms and wanted a surgical intervention. The increased risks of surgery, due to the aplastic anaemia, were explained to her and she was prepared to take the risk.

Her haemoglobin was 6.8g/dl, platelet count was  $13 \times 10^9/l$  and white cell count was  $2.8 \times 10^9/l$ . Her preoperative optimization was done in collaboration with the haematology department and the blood bank. She was transfused

Table. Peri-operative laboratory results of the patient with aplastic anaemia.

Laboratory variables	On admission	Pre-operative	1st Postoperative day	Normal range
Haemoglobin (gm/dl)	6.8	9.5	11.5	13.7 - 16.3
Haematocrit (%)	18.8	28.6	32.4	41.9 - 48.7
Leukocytes( $\times 10^9/L$ )	2.8	3.2	2.7	4.0 - 10.0
Platelets( $\times 10^9/L$ )	13	13	82	150 - 400
		(before transfusing platelets)		

transfused packed red cells and her haemoglobin was raised to 9.5g/dl and white cell count to  $3.2 \times 10^9/l$ . On account of the short half life of platelets, 10 units of platelets were transfused immediately preoperatively. The aim was to keep the platelet count above  $50 \times 10^9/l$  intraoperatively (Table).

General Anaesthesia was induced with intravenous pethidine, thiopentone and atracurium after careful preoxygenation. Aseptic precautions were taken for intravenous access and endotracheal intubation and prophylactic antibiotics were administered. The monitoring included a continuous electrocardiogram, non-invasive blood pressure, oxygen saturation, end-tidal carbondioxide temperature and urine output. The surgery was uneventful and lasted about ninety minutes. Surgical blood loss was approximately 500ml, which was replaced with packed red cells. Six units of platelets were transfused intraoperatively. The patient remained stable throughout the procedure with adequate urine output. Extubation was atraumatic and the patient made a good recovery. Postoperative pain relief was provided with pethidine using patient controlled intravenous analgesia. Regular blood counts were performed perioperatively (Table). Postoperative course was uneventful and the patient was discharged home on the fifth postoperative day.

## Discussion

Aplastic Anaemia is characterized by pancytopenia with depletion of all types of blood cells.<sup>1-3</sup> The problems associated with aplastic anaemia, that is, anaemia, thrombocytopenia and neutropenia, all pose a major threat to any patient requiring surgical intervention. The risks and benefits of surgery must be weighed carefully prior to making the decision to perform a surgical procedure on these patients. In order to avoid serious complications, adequate optimization is essential before proceeding with any elective surgery.<sup>4</sup> The advice of an experienced haematologist must be sought early and the support of a well equipped blood bank is essential to ensure a positive outcome.<sup>4,5</sup>

Anaemia should be corrected with packed red cell transfusion to a level of at least 8gram/dl in the absence of cardiac problems, while 10gm/dl is still taken as the minimum safe level by most anaesthesiologists for patients with ischaemic heart disease.<sup>6</sup> Thrombocytopenia, if not corrected preoperatively, can lead to serious intra and postoperative haemorrhage. Platelets have a very short half life and therefore, in order to achieve maximum benefit, it is important to carefully time the platelet transfusion.<sup>7</sup> These patients are receiving regular transfusions of both red cells and platelets, but their counts fall rapidly and adequate amount of blood and blood products must be available for the immediate perioperative period. Presence of neutropenia makes the patient prone to infection, therefore, it is mandatory to take aseptic precautions for all anaesthetic maneuvers including intravenous cannulation, endotracheal

intubation etc. For the same reason perioperative antibiotic cover is essential.<sup>4,5,8</sup> Regional anaesthesia (spinal/epidural) is absolutely contraindicated in the presence of thrombocytopenia<sup>4,8,9</sup>, therefore general anaesthesia is the only technique available for these patients.

When our patient first presented with menorrhagia, it was decided to put her on conservative management and to perform surgery only if all other measures failed. A close collaboration was maintained between the gynaecologist and the haematologist. The patient did not respond to conservative management, therefore a total abdominal hysterectomy was planned. The anaesthesiology team performed a thorough preoperative assessment and both the anaesthesiology and the haematology teams worked to acquire preoperative optimization.

Good postoperative pain relief was essential to allow deep breathing and adequate coughing so that secretions would not retain in the lungs, to prevent pulmonary infection. Low platelet counts rendered regional analgesia absolutely contraindicated in this patient, therefore, after preoperative counseling, patient controlled intravenous analgesia with pethidine was employed. This proved to be satisfactory. She required red cell and platelet transfusions on the 2nd and 4th postoperative day, with an uneventful and smooth recovery. She was discharged on the 5th postoperative day. Although the patient still requires platelet and red cell transfusions every 7-10 days, she is pleased that her troublesome symptom of menorrhagia has now been relieved.

The incidence of aplastic anaemia is 5-10 fold higher in the Oriental countries like Japan and Thailand compared to the Western world.<sup>1,2</sup> The authors have strived to retrieve literature about the perioperative anaesthetic management and problems associated with aplastic anaemia. Most of the literature that could be retrieved from web search originated from either Japan or Russia.<sup>4,5,8,9</sup> These articles have highlighted the problems associated with surgery and anaesthesia in these patients, which are similar to those that we faced with our patient. They have described their anaesthetic management and have stressed upon adequate replacement of blood components for a successful outcome.

## Conclusion

The anaemia, thrombocytopenia and neutropenia associated with aplastic anaemia pose a major threat to the patient in the perioperative period. The decision for surgery should be made carefully and surgery undertaken only if a patient has a life threatening or debilitating condition requiring surgical intervention. A thorough preoperative assessment and intensive preparation of the patient is mandatory before taking him or her to the operation theatre. Efficient blood bank services and good communication, cooperation and coordination between the surgeon, haematologist and anaesthesiologist are essential for a successful outcome of any surgical intervention in these patients.

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