CASE REPORT

Clinical Dilemma-Management of Low Rectal Cancer in a Jehovah's Witness

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ABSTRACT

Jehovah's Witness followers pose a clinical dilemma to the medical practitioners due to their religious belief of an absolute prohibition of blood transfusion under any circumstances. We present a case of Jehovah's Witness follower who underwent an ultra-low anterior resection for rectal cancer after neo-adjuvant chemo-radiotherapy. The challenges in the perioperative management are highlighted and managed accordingly.

KEYWORDS: *Jehovah's Witness perioperative, low rectal cancer in Jehovah's Witness, bloodless surgery*

INTRODUCTION

Jehovah's Witness is a movement within the Christian faith that has a distinct interpretation of the Christian faith as compared to the mainstream Christianity. Members of this faith interpret passages from the Old and New Testament that they should abstain from blood. They consider blood to be sacred as it is a gift of life from God. Thus, management of Jehovah's Witness followers have been frequently quoted in literature as technically challenging to the medical practitioners due to their religious belief of absolute refusal of blood transfusion including autologous transfusion.[1,2,3]

In Malaysia, the number of Jehovah's Witness is small compared to the western countries. Thus, managing a Jehovah's Witness follower patient requiring a major surgical procedure provides an opportunity to apply the principles of bloodless surgery when allogeneic transfusion is not permitted. Multidisciplinary approach with specific clinical strategies are needed to enhance erythropoiesis, effectively maximising oxygen delivery, minimising oxygen consumption both intraoperative/postoperatively and incorporating bloodless surgical techniques.[1] We present a case of Jehovah's Witness follower who underwent an ultralow anterior resection for a low rectal cancer after neo-adjuvant chemo-radiotherapy.

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CASE SUMMARY

A 60-year-old lady Jehovah's Witness presented with a 3-month history of per rectal bleeding and constipation. She had been investigated for mild anaemia and diagnosed to have a thalassaemia trait 5 years earlier. Digital rectal examination revealed a circumferential exophytic tumor 5 cm from the anal verge. Colonoscopy and biopsy confirmed adenocarcinoma. Computed tomography (CT) scan of the thorax and abdomen revealed a single liver nodule suspicious of metastasis. Magnetic resonance imaging (MRI) of the pelvis revealed a T_4N_0 disease of low rectal cancer. The carcinoembryonic antigen (CEA) level was 1.4 ng/ml. Clinical staging was $T_4N_0M_1$

She received neo-adjuvant concurrent chemo-radiotherapy (CCRT) regime of 45Gy given in 25

fractions over 5 weeks and two 14-day cycles of Capacetabine (Xeloda) 1gm twice daily. She then underwent ultra-low anterior resection 12 weeks after the CCRT.

Prior to the operation, her hemoglobin was 10g/dl. She expressed total refusal of transfusion of blood or blood products, no storage of her blood away from her body even in a critically ill situation and her willingness to perish without blood transfusion even if it was urgently required. Eventually, she agreed for specific components of blood to be used: cryoprecipitate, albumin and specific coagulation factors. She was given a dose of intravenous venofer (iron sucrose) 2 doses and subcutaneous recombinant erythropoietin 4000 unit of 3 doses for 1 week preoperatively and continued post surgery. Her final haemoglobin level after optimisation was 12 g/dl.

Intraoperatively, the anaesthetist employed the permissive hypotension approach with Mean Arterial Pressure (MAP) maintained at 50-65 mmHg to reduce risk of bleeding. She also received a single dose of tranexamic acid at induction. We performed an ultra low anterior resection with a de-functioning stoma. Intraoperative bleeding was minimal with estimated blood loss not more than 100mL.

Post operatively, she received further doses of intravenous iron and erythropoietin to increase red cell mass and bloodless surgery was successful with a good outcome.

DISCUSSION

Preparing a Jehovah's Witness for surgery is of interest and the principles can be applied in other patients as well. In recent years, attention has focused on the association between post operative blood transfusion and complications such as anastomotic leak, infection and long term disease progression.[10] The concept of immunomodulation and triggering the release of growth factors from red blood cells has been implicated for cancer recurrence and impact on the overall disease free survival. According to Abu-Ghanem et.al 26.8% of 500 laparoscopic colorectal surgery received blood transfusion, and the risk of transfusion is highest in patients with low preoperative hemoglobin, low rectal surgery, malignancy and presence of medical comorbidities.[10] These factors can be utilized to screen patients who would most probably need transfusion for alternative methods to avoid allogeneic transfusion.

A study in a bloodless centre in Soonchunhyang University Hospital in Korea has recruited over 1400 patients over 10 years of whom 94% were Jehovah's Witnesses. Although overall mortality was less than 1%, however the patients with hemoglobin less than 7 g/dl and with difference of hemoglobin post/ preoperative >50%, has an increased risk of cardiovascular complication and cerebrovascular accident.[4] Thus bloodless surgery is not without complication and low hemoglobin level is associated with prolong hospital stay in postoperative individuals.[6] The most crucial part of preparing this patient for surgery is counseling and fulfillment of advance health directive. Areas that need to be considered in discussion with patient includes acceptability of plasma derivatives, use of blood salvage techniques, the alternatives to blood transfusion and the risk of death in case of uncontrolled bleeding.[5] Formalized legally advance directive should be taken as precaution and options of minor fractions such as coagulation factors, albumin, thrombin concentrate should be discussed as this fall under individual consideration.[6,7] Thus discussion regarding acceptance of life saving transfusion in the event of similar condition should be well written to prevent medico legal consequences.

Among preoperative strategy includes thorough history of bleeding tendencies, or chronic diseases, enhance erythropoiesis by increasing red cell mass, and in particular, for a patient with malignancy, correction of anaemia or coagulopathy should begin first prior to commencement of chemotherapy and surgery.[1,5] Patient in this case report is at risk of being anaemic pre-operatively due to her thalassaemia trait diagnosed 5 years earlier, post neoadjuvant chemotherapy and from chronic diseases. Correction of anaemia should include treating folate, vitamin B or iron deficiencies and giving recombinant erythropoietin ideally four to eight weeks before surgery.[6]

However, erythropoietin is not without risks with known complications include hypertension and thrombosis. Other aspects include modifying drugs that can affect bleeding such as antiplatelet. Consultation with hematologist should be sought and

discussion regarding aim of hemoglobin level is made with guidance by expected blood loss during surgery.

Other options to discuss especially in oncological surgical procedures includes microfiltration of blood salvage techniques, preoperative tumor embolization and minimally invasive procedures such as radiofrequency ablation (RFA) for certain malignancies.[5] However in this patient, 2 out of 3 of the above are not among the appropriate options, while blood salvage technique is not the best option due to risk of fecal contamination in this surgery.

Intraoperative management can be divided into anaesthetic and surgeon's role. Among anaesthetist options include permissive hypotensive anaesthesia, prevention of hypothermia, usage of antifibrinolytics such as tranexamic acid and vasoconstrictors, strategy of acute normo-volemic-hemodilution and intraoperative blood salvage.[6] Careful patient positioning is also important to prevent high intrathoracic pressure and central venous pressure.

Surgical precautions intraoperatively include surgery to be done by senior personnel or high volume surgeon and use of minimally invasive technique. For complex cases, staged procedure is an alternative to prevent bleeding complications.[7] Usage of adjunct surgical technique such as diathermy dissection, harmonic scalpel and local hemostatic aids such as absorbable cellulose and collagen is advised.[1,7,8] Drain should be inserted to allow for early detection of bleeding.

Post operative managements include adequate sedation, ventilation and pain control to minimize oxygen demand and maximize oxygen delivery. Early breathing exercise and lung expansion manoeuvre is instituted, while any bleeding detected early should be acted upon. Continuation of recombinant erythropoietin, iron and adequate gastrointestinal bleeding prophylaxis should be continued.

In Jehovah's Witnesses, chemotherapy-induced thrombocytopenia or anaemia are also major areas of concern. Dose modification and selection of less myelosuppressive chemotherapeutic agent can reduce the risk of bone marrow suppression. The uses of erythropoietin and granulocyte colony stimulating factor (G-CSF) have an important role in the management of neutropenia.

CONCLUSION

Managing a Jehovah's Witness who needs to undergo surgery involves multidisciplinary team effort and thorough preoperative counseling. Although the 'no transfusion directive' gives a restriction to involved medical practitioners, the principle of bloodless surgery can be applied to other patients undergoing colorectal surgery as well, with regards to transfusion avoidance strategies.

CONFLICT OF INTEREST STATEMENT

The authors report no conflict of interest.

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