Bloodless Surgery in a Jehovah's Witness Patient with a 12.7-kg Uterine Leiomyosarcoma

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INTRODUCTION: Bloodless surgery aims to optimize outcomes in patients undergoing surgical procedures who wish to avoid allogeneic transfusion. Using a series of interventions and management strategies related to this goal, patients who were previously considered extremely high risk or inoperable without a blood transfusion can now undergo complex surgical procedures with acceptable outcomes. The techniques of bloodless surgery have been incorporated in order to care for a patient with a large uterine sarcoma with involvement and invasion into adjacent organs.

CASE: A 52-year-old female Jehovah's Witness patient refusing allogeneic blood transfusion presented to the gynecologic oncology division with a 40-cm pelvic mass and anemia. She was enrolled into the bloodless surgery program at the authors' institution and subsequently underwent surgical resection of a 12.7-kg uterine leiomyosarcoma. Although her intraoperative course was significant for severe anemia with a hemoglobin of 2.5 g/dl and her postoperative course required long-term hospitalization, the patient regained full function to her preoperative performance status.

CONCLUSIONS: Bloodless surgery in patients with a potential for large-volume intraoperative blood loss requires a well-organized systematic, multidisciplinary approach to achieve the best possible outcome (J Surg 64:212-219. © 2007 by the Association of Program Directors in Surgery.)

KEY WORDS: uterine leiomyosarcoma, Jehovah's Witness, anemia, bloodless surgery

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COMPETENCY: Patient Care, Medical Knowledge, Systems Based Practice

BACKGROUND

Bloodless medicine and surgery encompasses a broad spectrum of clinical strategies and techniques designed to avoid allogeneic transfusion and to minimize procedure-related blood loss. Although bloodless concepts have most often been used to address specific situations such as patient refusal of transfusion (eg, Jehovah's Witnesses or patients who experience extreme anxiety or fear with transfusions), or situations when blood safety, supply, or compatibility are in question, all patients could potentially benefit from the application of these strategies.[1]

A paucity of literature exists regarding bloodless surgery addressing aspects of preoperative, intraoperative, and postoperative care in gynecology patients, and virtually no reports have been published on the application of bloodless surgery in gynecologic oncology patients. In this communication, a case of a 52-year-old Jehovah's Witness woman with refractory anemia secondary to her underlying malignancy is presented. She underwent surgical resection of a 12.7-kg uterine leiomyosarcoma. An overview of the management strategies and techniques of bloodless surgery is provided.

CASE REPORT

A 52-year-old woman, para 1, presented for evaluation and management of a large pelvic mass. She had been complaining of increasing pelvic pressure, pain, and constipation, and her last menstrual period was approximately 2 months before presentation. A computed tomography (CT) scan revealed normal appearing upper abdominal organs, including liver, spleen, pancreas, gallbladder, and adrenal glands. A 27-cm × 19-cm mass originates from the pelvis with large solid and necrotic

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regions consistent with either uterine or ovarian origin. In addition, a 6.5-cm mass involves the right kidney with suggestion of tumor invading into the right renal vein and extending to the inferior vena cava. A moderate amount of ascites was present, and the patient had a large ventral hernia. The patient had normal upper and lower endoscopy procedures.

The patient identified herself as a Jehovah's Witness. Medical history was significant for anemia, morbid obesity (177 kg, body mass index (BMI) = 59), asthma, arthritis, sleep apnea, and hypertension. Medications included hydrochlorothiazide, fluticasone/salmeterol inhaler, albuterol inhaler and nebulizers, proton-pump inhibitor, stool softeners, and chronic narcotic use. On gynecologic history, the patient reported having a history of normal yearly Pap smears and a normal recent mammogram. No family history was reported for any gynecologic cancers. The patient did have a 7 pack-year smoking history, but she stated that she stopped smoking 30 years ago. On physical examination, the patient was a morbidly obese woman with a large palpable mass on abdominal examination. Pelvic examination was limited secondary to the habitus of the patient.

Her hemoglobin level at her initial visit was 9.9 g/dl, and her coagulation parameters were within normal limits.

She was enrolled into the bloodless surgery program at the authors' institution, and preoperative counseling was performed. The patient refused transfusion of any of the major fractions of blood. A hematology consult was obtained, and the patient was determined to have anemia secondary to malignancy. She was initially begun on a regimen of weekly erythropoietin, oral iron, and folic acid therapy. The following week the patient underwent attempted bilateral uterine artery embolization by interventional radiology; however, only the right uterine artery could be successfully embolized.

Despite continued attempts at preoperative hemoglobin optimization, the hemoglobin of the patient was found to be steadily decreasing, and by the third week after presentation, she was switched to daily erythropoietin with intravenous iron supplementation. She had been admitted to the hospital with decreased mobility, declining performance status, and increasing severe pelvic and abdominal pain and discomfort secondary to her enlarging mass. Over the next 2 weeks, the patient continued to drop her hemoglobin and a multidisciplinary conference was held.

All clinicians involved agreed that, if surgery was to proceed, a 2-stage approach would be necessary. The first surgery would involve removal of the large pelvic mass. A second surgery would be performed to evaluate the renal tumor after the patient recovered from the first procedure. A therapeutic panniculectomy would be performed to optimize surgical access given the morbid obesity of the patient. The added blood loss from the panniculectomy was carefully weighed against the surgical advantage it would provide. Preoperative evaluation and input from the intensive care unit and anesthesia teams were obtained, and preparations were made for intraoperative and postoperative care.

The patient fully participated in all preoperative discussions and wished to proceed with surgery without allogeneic transfusion despite a hemoglobin of 7.1 g/dl. Informed consent was obtained, and the patient understood the extreme risks associated with surgical intervention, including long-term morbidity and possible intraoperative or postoperative mortality. The patient had deep vein thrombosis prophylaxis with an intermittent pneumatic compression device throughout her intraoperative and postoperative course.

The patient underwent an exploratory laparotomy, lysis of adhesions, bilateral ureterolysis, supracervical hysterectomy, bilateral salpingo oophorectomy, sigmoid colon resection with side-to-side primary reanastomosis, ventral hernia repair, and panniculectomy. Findings at the time of surgery included a 35-cm uterine leiomyosarcoma densely adherent to bowel, pelvic sidewalls, and retroperitoneal structures. The tumor completely encased the left ureter and was densely adherent to the left external iliac vessels as well as portions of the inferior vena cava and aorta. The mass fully penetrated a large segment of the sigmoid colon mesentery. The upper abdominal organs, including the transverse colon, stomach, liver, small bowel, and omentum, were displaced both superiorly and into a ventral hernia sac. Multiple sites of neo-vascularity and parasitic blood supply involved portions of bowel mesentery and omentum to the mass. The decision to perform a supracervical hysterectomy was made intraoperatively given the already significant blood loss along with the fact that the bladder was densely adherent to the anterior cervix. The hernia defect was closed primarily without tension after removal of the mass. The skin and subcutaneous layers were left open and packed to proactively minimize the risk of wound infection postoperatively.

Intraoperative hemoglobin was 2.5 g/dl, and estimated blood loss was 2500 ml. Recombinant factor VIIa was administered at a dose of 90 mcg/kg intravenously. Approximately 282 ml of concentrated cell salvage blood was collected and infused after filtering through a leukocyte depletion filter to minimize/eliminate intravenous dissemination of malignant cells. Intraoperative fluids included 5200 ml of crystalloid and 100 ml of albumin. Acute normovolemic hemodilution was not performed secondary to the patient's low starting hemoglobin of 7.1 g/dl.

Other than the significant blood loss and resultant severe intraoperative anemia of the patient, no technically related or other intraoperative complications occurred.

Postoperatively, the patient was managed in the intensive care unit with a plan for supportive care, limited blood draws (using pediatric tubes), tolerance of anemia, and parenteral nutrition. As a general rule in the care of severely anemic postoperative patients, the mainstay of treatment is minimal interventions and supportive care. Because of an inability to wean from ventilatory support in a timely fashion, likely secondary to a combination of severe anemia along with significant comorbidities, including severe asthma, obesity, and sleep apnea, she required a tracheostomy for long-term ventilatory support. She was again placed on a regimen of iron and daily erythropoietin therapy and steadily raised her hemoglobin approximately 1 g/dl per week. As a major postoperative complication, the