
Pancreas and Liver Resection in Jehovah's Witness Patients: Feasible and Safe

Ioannis T Konstantinidis, MD, Peter J Allen, MD, FACS, Michael I D'Angelica, MD, FACS, Ronald P DeMatteo, MD, FACS, Mary E Fischer, MD, Florence Grant, MD, Yuman Fong, MD, FACS, T Peter Kingham, MD, William R Jarnagin, MD, FACS

BACKGROUND: Jehovah's Witness (JW) patients undergoing liver or pancreas surgery represent a challenging ethical and medical problem, with few reports about their optimal management.

STUDY DESIGN: To analyze the perioperative outcomes of JW patients submitted to hepatic or pancreatic resection, clinicopathologic data of JW patients who underwent surgical exploration for a hepatic or pancreatic tumor between March 1996 and July 2011 were reviewed retrospectively.

RESULTS: Clinicopathologic data of 27 patients, 28 explorations, and 25 resections were included. Median age was 58 years (range 28 to 75 years) and 20 patients were female. Three patients were explored and deemed unresectable. Fifteen hepatic resections (9 segmentectomy or bi/trisegmentectomy, 6 hemi-hepatectomy or extended hepatectomy) and 10 pancreatic resections (6 pancreaticoduodenectomy, 4 distal pancreatectomy/splenectomy) were reviewed; additional organs were resected in 5 patients (2 gastrectomy, 1 colectomy, 1 nephrectomy, 1 adrenalectomy, 1 salpingoophorectomy). Median estimated blood loss for the hepatectomies was 400 mL (range 100 to 1,500 mL) and for the pancreatectomies was 400 mL (range 250 to 1,800 mL). Six patients received preoperative erythropoietin; hemodilution was used in 9 patients and 3 had Cell Saver—generated autotransfusions. Median preoperative hemoglobin was 12.5 g/dL (range 9.5 to 14.4 g/dL) and median postoperative hemoglobin was 10.4 g/dL (range 9 to 12.4 g/dL). In-hospital mortality was 0%. One patient required re-exploration for decreasing hemoglobin and refusal of transfusion; a total of 11 complications developed in 7 other patients (5 wound infection/breakdown, 1 urinary tract infection, 1 ileus, 1 nausea/vomiting, 1 lymphedema, 1 ascites, and 1 ARDS). Median hospital stay was 7 days (range 4 to 23 days).

CONCLUSIONS: Pancreatic and liver resection can be done safely in selected JW patients who refuse blood products by using a variety of blood-conservation techniques to help spare red cell mass. (J Am Coll Surg 2013;217:1101–1107. © 2013 by the American College of Surgeons)

The Jehovah's Witness (JW) Society, founded in 1872 in Pittsburgh and based in New York, is an international religious organization numbering around 7 million members worldwide in more than 230 countries.¹ Jehovah's Witnesses generally do not permit the use of allogeneic blood products, due to fear of losing eternal life, which is based on the belief that transfused blood is

a nutrient and that blood transfusion is equated with "eating" blood.² Currently, only the primary blood components (ie, red cells, white cells, platelets, and plasma) are specifically banned, and secondary blood components, such as albumin, cryoprecipitate, or clotting factors, are allowed, based on the individual's belief. Additionally, autologous blood transfusion can be allowed if the blood is not separated from the patient's blood at any time. However, preoperative blood donation with the aim of later autotransfusion is not acceptable.¹

The medical management of JW patients raises medical, ethical, and legal issues,³ especially in the setting of major operative procedures, when the potential for blood loss and the need for blood replacement is significant. Although transfusion rates associated with pancreatectomy and partial hepatectomy have decreased over time,⁴⁻⁶ these procedures still fall into the high-risk category.

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Received April 20, 2013; Revised May 17, 2013; Accepted May 17, 2013. From the Departments of Surgery (Konstantinidis, Allen, D'Angelica, DeMatteo, Fong, Kingham, Jarnagin) and Anesthesia (Fischer, Grant), Memorial Sloan-Kettering Cancer Center, New York, NY.

Correspondence address: William R Jarnagin, MD, FACS, Department of Surgery, Memorial Sloan-Kettering Cancer Center, 1275 York Ave, New York, NY 10065. email: jarnagiw@mskcc.org

A number of blood-sparing techniques have evolved, primarily in response to concerns about transfusion-related complications and the declining donor pool. The volume of blood transfused is increasing at a rate of 6% per year, raising concerns that demand will soon overcome the supply.⁷ The development of blood-conservation strategies, including acute normovolemic hemodilution (ANH), autologous blood donation, and intraoperative cell salvage (Cell Saver), has been important for preservation of the national blood supply, and some of these approaches can be used in surgical procedures in JW patients.

Specific protocols for transfusion-free surgery have been developed in some specialties, for example, in cardiac surgery⁸; however, experience with pancreas and liver surgery in JW patients is limited, with most of the existing literature in the form of case reports.^{9,10} Greater experience has been reported in the area of liver transplantation about preoperative management and intraoperative use of ANH and cell-salvage techniques, which appear to reduce the need for transfusions.^{11,12}

The aim of the current study is to review the authors' experience with surgery for pancreas and liver neoplasms in JW patients, focusing on the safety and effectiveness of these procedures and the perioperative techniques used.

METHODS

Patient selection and recorded data

Data on patients who underwent pancreas and liver surgery and identified themselves as JW were retrospectively analyzed from March 1996 through July 2011. Two prospective databases of pancreatic and hepatic operations maintained by the Department of Surgery at Memorial Sloan-Kettering Cancer Center, as well as institutional databases, were reviewed to identify patients older than 18 years of age who underwent surgical exploration for a hepatic or pancreatic tumor. All surgical procedures were performed by attending surgeons in the Department of Surgery at Memorial Sloan-Kettering Cancer Center, with the primary indication being elective removal of pancreas and liver neoplasms.

Preoperative data analyzed included patient demographics, medical and surgical history, and laboratory values (ie, hemoglobin, platelet count, international normalized ratio, total bilirubin, albumin, and creatinine). Intraoperative data were obtained from the operative note and the anesthesia record and included extent of resection, concomitant major procedures in addition to the principal procedure, operating time, portal hepatic clamp time (Pringle time), and estimated blood loss. Postoperative data included duration of hospital stay and laboratory values (hemoglobin).

Preoperative informed consent

In all cases, the attending surgeon and one or more attending anesthesiologists discussed the operation with the patient, emphasizing the risks associated with refusal of blood products in the setting of major surgery and pointing out the available options for blood conservation, including preoperative hemoglobin optimization (through iron and/or erythropoietin) and intraoperative use of ANH and intraoperative cell salvage with the use of Cell Saver. All patients were required to sign a consent form for the performance of diagnostic and therapeutic procedures without the use of blood products that specifically outlines the risks and addresses which blood-conservation options, if any, can be used.

The technique of ANH, when used, was applied as the authors have described previously for liver and pancreas resections.^{13,14} Acute normovolemic hemodilution involves the removal of whole blood from the patient after induction of anesthesia and replacement with crystalloid or colloid to maintain intravascular volume. The removed blood is then reinfused at the completion of the procedure. Blood salvage with the use of Cell Saver entails intraoperative collection of blood by suction, filter of blood, and transfusion back to the patient, with the use of equipment maintaining the blood in circuit with the patient at all times.¹⁵ Erythropoietin, often combined with administration of iron sulfate, can be used preoperatively to improve red cell mass, even in the absence of anemia,¹⁶ although this approach has recently fallen out of favor due to the increased risk of deep vein thrombosis.¹⁷

Surgical technique

This study analyzed only patients who underwent partial hepatectomy or pancreatectomy. We included 3 patients for whom an attempted hepatectomy or pancreatectomy was abandoned. Liver resections were performed with a standard technique using low central venous pressure (central venous pressure <5 cm H₂O) anesthetic principles and selective intermittent Pringle maneuver (porta hepatis clamping), as described previously.^{5,18} After operation, patients were typically monitored overnight in the recovery room and then transferred to the ward, provided they were stable clinically. Pancreas resections were performed using standard techniques, as described previously.^{14,19} For pancreaticoduodenectomy, the type of resection (pylorus preserving or standard pancreaticoduodenectomy) was dictated by the attending surgeon's preference; reconstruction was typically performed to a single jejunal loop with a duct to mucosa pancreaticojejunostomy. Details about the intraoperative use of ANH and/or intraoperative cell salvage were recorded.

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