Pancreaticoduodenectomy for pancreatic cancer in Jehovah’s Witness using inferior pancreatoduodenal artery first approach

Volodymir M. Kopchak\textsuperscript{1,2,3,4,5,6,7}, Kostiantyn V. Kopchak\textsuperscript{2}, Andriy V. Ratushniuk\textsuperscript{3}, Nina G. Davidenko\textsuperscript{4}, Liudmila O. Pererva\textsuperscript{6}, Sergiy V. Andronik\textsuperscript{6} and Oleksandr O. Kvasivka\textsuperscript{7}\textsuperscript{*}

\textsuperscript{1,2,3,4,5,6,7} National institute of surgery and transplantology named after O.O. Shalimov, Kiev, Ukraine

Pancreaticoduodenectomy is an accepted procedure for management of pancreatic carcinomas. The procedure is associated with significant operative blood loss. Therefore, blood transfusion is an important supportive measure. Jehovah’s Witnesses are widely known for their prohibition on the acceptance of blood transfusion. Despite their belief regarding transfusion, Jehovah’s Witnesses do not have a higher mortality rate after traumatic injury or surgery. We represent the case of pancreaticoduodenectomy with vein resection in Jehovah’s Witness. During the November - December 2011 period 2 female Jehovah’s Witness underwent pancreaticoduodenectomies for pancreatic cancer. Preoperative biliary stent was placed in second patient. Both patients had Whipple operation, using inferior pancreatoduodenal artery first approach. In the first case en-block resection of the affected superior mesenteric vein was done. Intraoperative blood loss was 100 ml in the first case and 200 ml in the second case. No postoperative complications occurred in the first case; postoperative period was complicated by pancreatic fistula grade B in the second case. No transfusion of blood and blood products was done in both cases. We did not use cell-saver in both cases. The contemporary surgical techniques make it possible to perform pancreaticoduodenectomy with minimal blood loss and low risk of surgical complications.

**Key words:** Jehovah’s Witness, pancreaticoduodenectomy, surgery, inferior pancreatoduodenal artery first approach; pancreas.

**Abbreviations:** Pancreaticoduodenectomy (PD), Jehovah’s Witness (JW), superior mesenteric vein (SMV), Computed tomography (CT), inferior pancreatoduodenal artery (IPDA), superior mesenteric artery (SMA).

**INTRODUCTION**

Major surgery in Jehovah's Witness (JW) patients remains a challenging problem, while transfusion of blood and blood products is strictly forbidden. The main problem that surgeons stay upon is that mean blood loss during pancreaticoduodenectomy (PD) range from 400 to 800 ml (Fernandez-Del CC 2012; Yeo CJ 1999; Dumitrescu T, 2010; Waters JH). That's why patients, undergoing PD, usually require transfusion of blood products. Recently many centers have reported successful major surgical procedures in JW patients using blood saving techniques and perioperative conservative treatment.

**Corresponding author:** Oleksandr O. Kvasivka, National institute of surgery and transplantology named after O.O. Shalimov, Kiev, Ukraine. Mail: 01021 Geroev Sevastopolya str. 30, Kiev, Ukraine. Tel/fax +38044 408 5717, dr.kvasivka@yahoo.com
The majority of these procedures were made in cardiac and vascular surgery (Reyes G 2007; Ott DA 1977; Jassar AS 2012). Only few cases of pancreaticoduodenectomy in JW patients are described in literature. Also the only case of successful treatment of locally-advanced pancreatic cancer is described by using neoadjuvant treatment and down staging the tumor (Magner D 2006).

We represent 2 cases of successful PD in JW patients without intraoperative use of cell-saver with minimal blood loss in both cases. In the first case PD was done with en-block resection of the affected part of superior mesenteric vein (SMV).

Case report 1

50 years old female JW was hospitalized with non-permanent epigastric pain, jaundice and purities. Her past medical history was unremarkable.

Computed tomography (CT) demonstrated a 4 cm pancreatic head mass with involving of lateral trunk of SMV and staged as T3\(N0M0\) (fig.1).

Total and direct bilirubin levels were 6.2 mg/dL and 4.4 mg/dL correspondingly. During preoperative treatment the trend to increase hemoglobin level was noted – from 135g/l up to 141 g/l.

Patient was taken to surgery and underwent pancreaticoduodenectomy with en-block vein resection. Peculiarities of the procedure: anatomical peculiarities - right hepatic artery departs from superior mesenteric artery; during the procedure inferior pancreaticoduodenal artery (IPDA) was dissected and ligated before transaction of the pancreas (IPDA first approach); en-block resection of the affected segment of lateral trunk of SMV was done after completion of detachment of the posterior adhesions from the superior mesenteric artery (SMA) (fig.2); intraoperative blood loss was 100 ml; lymphadenectomy of 12, 13, 17 and partial 14 groups of lymph nodes was done.

Child’s reconstruction was made with formation duct-to-mucosa pancreaticoenteric-, bilioenteric- anastomoses in retrocolic position and gastroenteroanastomosis in antecolic position (Shinji Osada 2012). The duration of the operation was 425 minutes.

No postoperative complication occurred. Coagulopathy occurred on the third postoperative day due to lymphorrhea and loss of blood factors of coagulation. Patient was discharged on the 12th postoperative day. Final pathology was ductal adenocarcinoma of the head of pancreas. pT3\(N0M0\). Stage II A.

Case Report 2

A 57 years old female JW hospitalized with non-permanent epigastric pain. Previously a biliary stent was placed endoscopically because of jaundice.

CT demonstrated a 2 cm pancreatic head mass without involving of adjacent organs and lymph nodes and staged as T2\(N0M0\).

During preoperative treatment the trend to increase hemoglobin level was noted – from 138g/l up to 150 g/l.
Patient was taken to surgery and underwent standard pancreaticoduodenectomy with IPDA first approach. En-block lymphadenectomy of 12, 13, 17 and partial 14 groups of lymph nodes was done. Intraoperative blood loss was 200 ml. Reconstruction was made on the one loop after Child with formation of duct-to-mucosa pancreaticoenteric, biloenteric anastomoses in retrocolic position and gastroenteroanastomosis in antecolic position. Duration of the procedure was 330 minutes.

Postoperative period was complicated by pancreatic fistula grade B (in accordance with international study group of pancreatic fistula classification) (Bassi C 2005).

Patient was discharged on the 11th postoperative day. Final pathology was ductal adenocarcinoma of the head of pancreas. pT3N0M0G2, Stage IIA.

**DISCUSSION**

According to the JW doctrine, doctors have no legal right to transfuse blood and blood products even if it can save life without a prior consent of a patient (Kullar PJ 2011).

The restoration of blood clotting properties by Vitamin K and Etamsylate, which are usually used on patients with surgical diseases, especially on patients with obstructive jaundice, is insufficient. Practical experience shows, that patients after PD sometimes require additional transfusions of plasma. But this is unacceptable for the JW patients. A one-week course with erythropoietin alpha 10 000 IU every second day and iron 200 mg/day was performed in the preoperative period to raise the level of hemoglobin.

There are only a few of documented cases of JWs undergoing PD previously presented in the literature. (Magner D 2006; Mizuno J 2011; Emmert MY 2011; Shiozawa S 2003; Atabek U 1999; Bonatti H 2007) Also no case of PD with concomitant vein resection was reported previously. In all reported cases cell-saver was used to compensate intraoperative blood loss. Implementation of contemporary surgical techniques made it possible to minimize intraoperative blood loss for patients undergoing PD (Dumitrascu T 2010; Ishizaki Y 2010). Mean blood loss during pancreaticoduodenectomy range from 400 to 800 ml (Fernandez-Del CC 2012; Yeo CJ 1999; Dumitrascu T. 2010; Waters JH). We implemented in our clinic technique of IPDA ligation first approach, described in literature by Ishizaki Y. et al (Ishizaki Y 2010). According to the literature intraoperative median blood
loss in patients with early ligation of the IPDA was 380 ml, which was significantly lower than 850 ml in patients who had a standard PD (p < 0.001). In 46% of patients with standard PD a perioperative transfusion of blood components was needed, comparing to 2% of patients with early ligation of the IPDA (Ishizaki Y 2010).

In our JW patients PD was done with blood loss of 100 and 200 ml that did not require any transfusion of blood components. Simultaneous resection of the affected lateral trunk of the SMV did not increase blood loss (100 ml) in our patient.

Postoperative complications (postoperative pancreatic fistula) occurred in patient No2. Patient No1 postoperative period was not complicated, but signs of coagulopathy were marked in blood tests. This patient was operated without biliary decompression and one of the factors of coagulopathy could be hepatic insufficiency. We use in our practice the doctrine that the preoperative biliary decompression increases levels of postoperative complications (Bonatti H 2007; Ishizaki Y 2010).

In both patients lymphadenectomy of 12, 13, 17 and partial 14 groups of lymph nodes was done. Previously, in our clinic, we used extended modified lymphadenectomy with preservation of neural ganglia left to the SMA. After publication of the results of Japanese multicenter trial we have changed our tactics (Pisters PW 2001). Resection of the lymph nodes right to SMA was done after dissection of the SMA. This was necessary for an early detection and ligation of the IPDA. Other groups of lymph nodes that were previously dissected in our clinic as a standard procedure in these patients were preserved.

Serious requirements in surgical treatment for JW dictate certain conditions.
1. PD with resection of the vein should be performed in a clinic, which has extensive experience in the implementation of the PD as well as resection of the vessels.
2. The operation should take place with the blood-preserving technologies. Such technologies include both: equipment (careful hemostasis with using modern devices) and surgical technique (for example IPDA first approach).

CONCLUSION
It is possible to perform PD with minimal blood loss and low risk of surgical complications using contemporary surgical techniques.

Conflict of interest
The authors have no potential conflict of interest

REFERENCES


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