Case Report: Spleen-preserving Multivisceral Transplant for Peutz–Jeghers Syndrome

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ABSTRACT

Case Report. A 24-year-old man diagnosed with Peutz–Jeghers syndrome as a child underwent multiple surgeries owing to intussusception. Pretransplant workup showed >150 polyps along the gastrointestinal (GI) tract, some of them with high-grade dysplasia. Despite having intestinal sufficiency, a modified multivisceral transplantation was offered.

Procedure. An 18-year-old donor was procured using University of Wisconsin solution. The recipient's surgery started with a midline incision. Mobilization of the right colon and the root of the mesentery was done to isolate the superior mesenteric artery. The same maneuver was done with the left and sigmoid colon. The common bile duct was then isolated and transected at the cystic duct level. The abdominal portion of the esophagus and the proximal stomach were isolated and divided at the gastroesophageal junction. After that, the pancreas was mobilized, preserving the spleen with the splenic vessels. The distal GI tract was transacted at the level of the proximal rectum. For engraftment, an arterial conduit was placed in the infrarenal aorta and anastomosed to the graft's aortic patch. End-to-side portal reconstruction was made at the level of the portal vein, allowing performing a duct-to-duct biliary reconstruction over a 5-Fr T-tube. A hand-sewn gastrogastric anastomosis and piloroplasty were performed; the distal anastomosis was done with circular staplers. A gastrojejunostomy and a loop ileostomy were the final steps of the procedure.

Results. The patient stayed in intensive care for 2 days and enteral feeds were started on day 7. Currently, 23 months after transplant he is alive with an excellent quality of life.

THE PEUTZ–JEGHERS SYNDROME (PJS) is an autosomal-dominant disease in which multiple gastrointestinal (GI) polyps develop over the GI tract, associated with mucocutaneous pigmentation. The incidence of the condition is 1 in 50,000 to 1 in 200,000 live births [1]. Mucocutaneous pigmented lesions occur in 95% of the patients. GI polyps consist in a frondlike elongated epithelial component and cystic gland dilatation extending into the submucosa or muscularis propria and arborizing smooth muscle extends into the polyp fronds; these are usually referred as "hamartomas" and polyps in small bowel may display "pseudoinvasion," which can be mistaken for invasive carcinoma [2]. Polyps are most seen in the small bowel and colon, and can cause bleeding, anemia, and abdominal pain owing to intussusception, obstruction, or infarction. Patients can evolve to short gut syndrome and intestinal failure in

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some cases, but in others the major risk is cancer. We present the video of a PJS case in which we offered a spleen-preserving modified multivisceral transplant (Video 1 available online at http://www.transplantation-proceedings.org/). The patient presented without intestinal failure, but with biopsy-proven severe dysplasia in a giant proximal polyp.

CASE PRESENTATION

We present the case of 24-year-old man was diagnosed at the age of 8 with PJS. Since then, the patient has experienced multiple episodes of small bowel obstruction, some of them owing to intussusception of large polyps, leading to a total of 8 surgeries with several intestinal resections, but maintaining intestinal autonomy. After the last surgery as an adolescent age, he was referred to our center for evaluation. His nutritional status was adequate (body mass index, 21.47 kg/m^2), a capsule endoscopy showed >150 polyps located from stomach to colon; the largest was about 6 cm and was localized in proximal jejunum (Fig 1). Endoscopic biopsies showed dysplasia in several polyps, from low to high grade. Computed tomography enterography and contrast-enhanced radiography were also performed (Fig 2). After a multidisciplinary evaluation, a modified multivisceral transplant was proposed, and the patient was placed on the waiting list. After 36 months on the waiting list, an ideal 18-year-old donor was offered and procured using University of Wisconsin preservation solution. The recipient surgery was started with a midline incision and the autostatic abdominal retractor was placed to obtain an adequate exposure of the full abdominal cavity. Mobilization of the right colon up to the root of the mesentery was done to isolate the superior mesenteric artery. The same maneuver was done with the left and sigmoid colon. The common bile duct was then identified, isolated, tied, and transected at the cystic duct level. The hepatic artery was dissected, isolated as well as the portal vein. After that, the common hepatic artery and the celiac trunk were exposed up the level of the supraceliac aorta. The abdominal portion of the esophagus and the proximal stomach were isolated and mobilized, to perform the division at the gastroesophageal junction with GIA staples. After that, mobilization of the pancreas was carried out preserving the spleen and the splenic vessels. The distal GI tract was transacted at the level of the proximal rectum. For engraftment, an arterial conduit was placed to the aorta and anastomosed to the graft's aortic patch. Portal reconstruction was made end-to-side at the level of the portal vein, allowing to perform a duct-to-duct biliary reconstruction over a 5-Fr T-tube. A hand-sewn gastrogastric anastomosis and piloroplasty were performed; the distal anastomosis between the donor's sigmoid colon and the recipient's rectum was done with circular staplers. A gastro-jejunostomy and a loop ileostomy were the final steps of the procedure, before closing the abdomen. The cold ischemia time was 440 minutes and the warm ischemia time was 45 minutes. The patient stayed 2 days in intensive care; mechanical ventilation weaning was done during the first 24 hours. No vasopressors were needed. Oral and enteral feeding was started at postoperative day 7. For immunosuppression, thymoglobulin was used for induction, with tacrolimus, steroids, and sirolimus for maintenance regimen, based on his pretransplant immunologic risk. Currently, the patient is alive and rejection free 23 months after transplantation with a current body mass index of 22.66 kg/m^2.

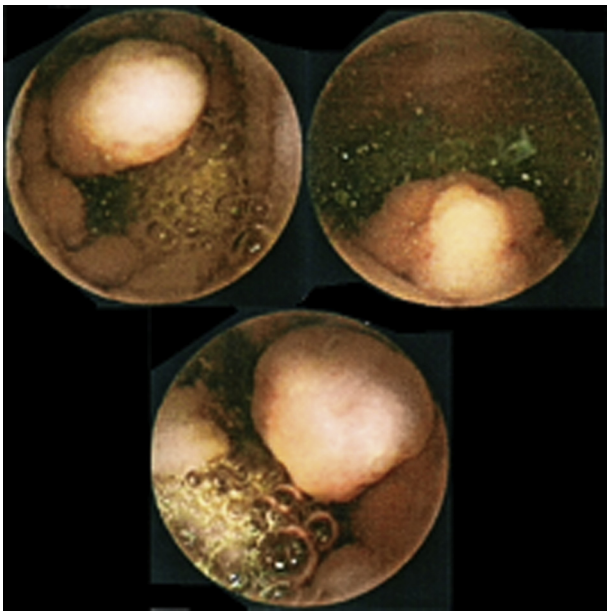

Fig 1. Capsule scope views showing large polyps at the jejunum.

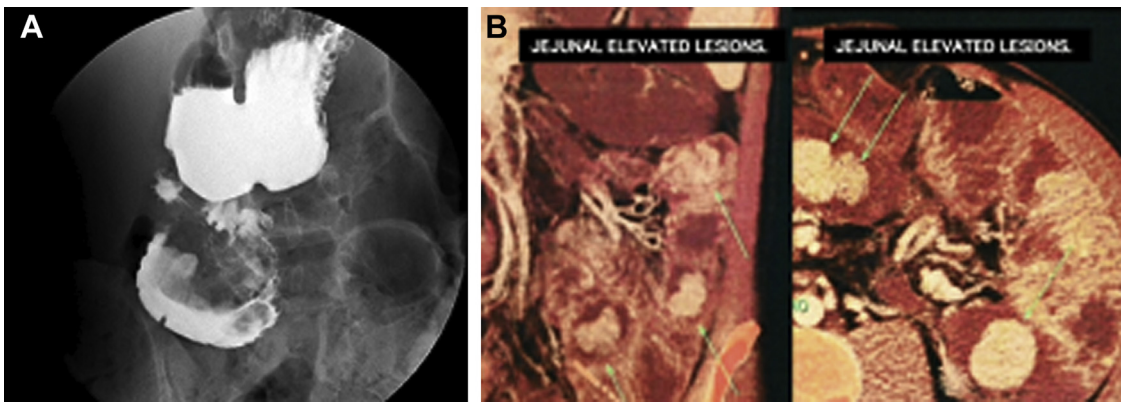

Fig 2. (**A**) Upper gastrointestinal series confirms the presence of large polyps at the duodenum. (**B**) Computed tomography enterography shows large lesions at the jejunum.

Table 1. Probability of Cancer Development in Peutz–Jeghers Syndrome

Site	Risk Ratio	Frequency (%)	Mean Age (y)	Age Range (y)
Esophagus	57 (2.5–557)	0.5	67	
Stomach	213 (96–368)	29.0	30.1	10–61
Small bowel	520 (220–1306)	13	41.7	21–84
Colon	84 (47–137)	39	45.8	27–71
Pancreas	132 (44–261)	36	40.8	16–60
Lung	17 (5.4–39)	15		
Testis	4.5 (0.12–25)	9	8.6	3–20
Breast	15.2 (7.6–27)	54	37.0	9–48
Uterus	16 (1.9–56)	9		
Ovary	27 (7.3–68)	21	28.0	4–57
Cervix	1.5 (0.31–4.4)	10	34.3	23–54

Adapted from Giardiello et al [6].

DISCUSSION

To the best of our knowledge, no specific reports on modified-multivisceral transplant for PJS are found on the literature, but the disease is included as an indication for intestinal and multivisceral transplantation in several series. PJS occurs owing to a mutation on the gene encoding a serine-threonine kinase STK11 (LKB1), located in 19p13.3. The loss of heterozygosity in polyps and malignancy suggest that STK11 acts as a tumor suppressive gene and its function is still being clarified [3]. Cancer development and relation to PJS was controversial, but it has been recognized that a unique hamartoma–adenoma–carcinoma pathway might exist [4] and cancer can also arise in the background of mucosal instability, through conventional oncogenesis paths. There is an increased risk of cancer development in PJS [5]. Table 1 shows the relative risk of specific organ malignancies [6]. PJS has no ideal treatment; surgery alone can treat symptoms or complications of the disease. Therefore, modified multivisceral transplantation (liver sparing) was proposed and successfully performed by some groups in PJS patients that evolved to short gut syndrome owing to complications related to recurrent intussusceptions or with potential risk of cancer development [7,8].

We present a video on our first case and the treatment chosen for this disease. Although we exposed on the possibility that PJS is not oncogenic per se, the high risk of cancer development is currently acknowledged.

The indication for transplantation was difficult, mainly because this patient did not suffer from intestinal failure. The impossibility of predicting the timing for cancer evolution and the understanding that a positive diagnosis of malignancy would preclude him as a transplant candidate, were considered as strong arguments to proceed with the transplant indication. The case was presented and approved by the liver and intestinal transplant expert group of the Instituto Nacional Central Unico Coordinador de Ablacion e Implante [9]. The final pathology inform was consistent with Peutz-Jeghers polyposis (hamartomatous polyps) and negative for cancer. The patient has been kept on sirolimus and tacrolimus as maintenance immunosuppression.

In conclusion, this video shows a case of a modified multivisceral transplant in a PJS patient in which transplant appears as the only alternative to modify the complete abdominal GI phenotype in order to modify the natural history of this disease. The presence of high-grade dysplasia should be considered as the primary indication for transplantation as the only curative option, even in the absence of intestinal failure.

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SUPPLEMENTARY DATA

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.transproceed.2016.01.014.