



Spleen Preserving Distal Pancreatectomy, Case Report and Literature Review

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ABSTRACT

Distal pancreatectomy is a surgical method used in the treatment of pancreatic tumors located in the body and tail. Although it is often applied together with splenectomy, spleen-preserving distal pancreatectomy surgical techniques have been developed upon revealing the benefits of spleen preservation in the early and late postoperative period. The two most frequently preferred surgical procedures are the Warshaw (by ligating the splenic vessels) and Kimura (preserving the splenic vessels) techniques. Considering complications like the length of operation and estimated blood loss, postoperative splenic infarction-abscess development, gastric varices formation, both techniques have superiorities over the other. Depending on the clinical characteristics of the patient, tumor and surgeon's experience, either technique may be preferred as open or minimally invasive surgery. In this review, we aimed to present the spleen-preserving distal pancreatectomy surgical technique that we preferred for a lesion with suspected malignancy located in the pancreatic body-tail junction, in a 46-year-old male patient with no known comorbidity and who was examined as an outpatient with the complaint of abdominal pain.

Keywords: Distal pancreatectomy, Kimura technique, spleen preserving, Warshaw technique

ÖZ

Dalak Koruyucu Distal Pankreatektomi, Olgu Sunumu ve Literatür Taraması

Distal pankreatektomi gövde-kuyruk yerleşimli pankreatik tümörlerin tedavisinde uygulanan cerrahi yöntemdir. Sıklıkla splenektomiyle birlikte uygulansa da dalağın korunmasının hastaya postopertif erken ve geç dönemde sağlamış olduğu yararlarının ortaya koyulmasıyla dalak koruyucu distal pankreatektomi cerrahi teknikleri geliştirilmiştir. En sık tercih edilen iki cerrahi prosedür Warshaw (splenik damarlar bağlanarak) ve Kimura (splenik damarlar korunarak) teknikleridir. Ameliyat süresi ve tahmini kan kaybı, ameliyat sonrası dalak enfarktüsü-apse gelişimi, mide varis oluşumu gibi komplikasyonlar göz önüne alındığında her iki tekniğin de birbirine üstünlükleri vardır. Hastanın tümörün klinik özelliklerine ve cerrahın deneyimine göre her iki teknikten biri açık ya da minimal invaziv cerrahi olarak tercih edilebilir. Bu derlemede karın ağrısı şikayetiyle ayaktan tetkik edilen, bilinen ek hastalığı olmayan 46 yaşında erkek hastanın pankreas gövde-kuyruk birleşimi yerleşimli, malignite şüphesi olan lezyona yönelik tercih ettiğimiz dalak koruyucu distal pankreatektomi cerrahi tekniğini sunacağız.

Anahtar Kelimeler: Dalak koruyucu, distal pankreatektomi, Warshaw tekniği, Kimura tekniği

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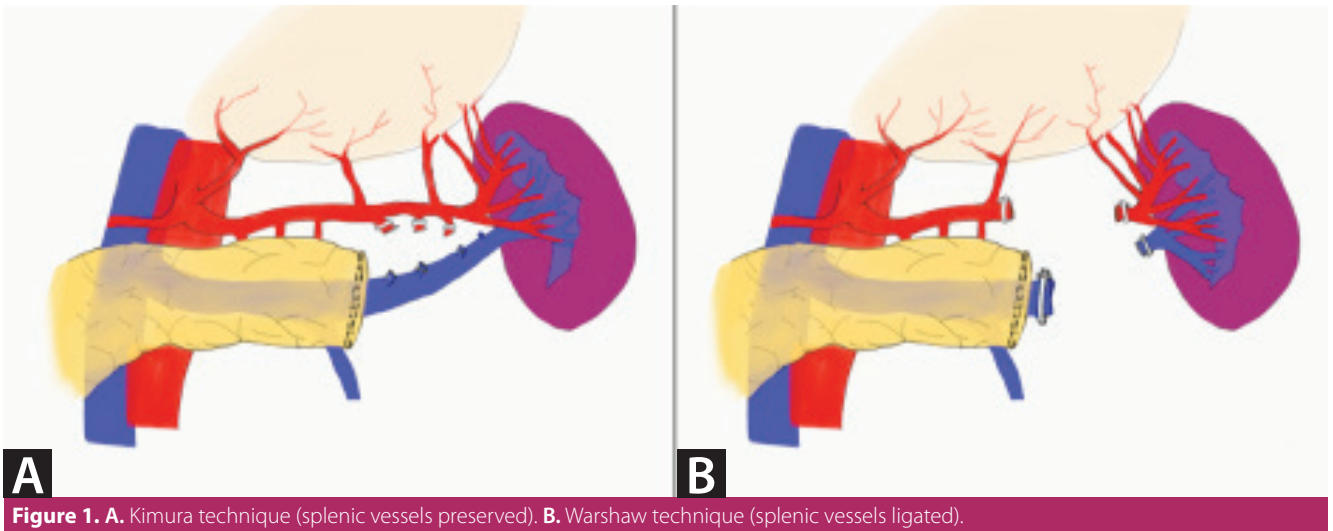
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INTRODUCTION

Surgical intervention for pancreatic pathologies is one of the most challenging issues of abdominal surgery. In benign or malignant tumors located in the pancreatic body or tail, distal pancreatectomy (DP) can be performed with or without preservation of the spleen. Splenectomy may increase the risk of infection caused by encapsulated bacteria, thrombocytosis, and lung hematologic ovarian cancer (1,2).



Spleen-preserving distal pancreatectomy (SPDP) techniques have been developed to avoid these complications. Warshaw et al. by ligating the splenic artery and vein in 1988 and Kimura et al. by preserving the splenic vessels in 1996 defined the most commonly used SPDP techniques (3,4) (Figure 1). Depending on the anatomical location of the lesion, previous attacks of pancreatitis and whether there is invasion or not, a detailed evaluation should be made preoperatively. It should be decided whether the spleen will be preserved or which SPDP technique will be preferred (5). Distal pancreatectomy and splenectomy should be performed in suspected malignant invasion of the splenic vessels and hilus (6).

Informed consent was obtained from the participant and Helsinki Declaration rules were followed to conduct this study.

CASE PRESENTATION

A 46-year-old male patient with no comorbidities was admitted to the outpatient clinic with the complaint of nonspecific abdominal pain. There was epigastric tenderness in the abdominal examination. There were no pathological findings related to the other systems examinations. Laboratory results were unremarkable. In the radiological examinations, abdominal tomography and endosonography revealed a 22 x 18 mm sized, heterogeneous necrotic lesion containing two 3-5 mm cystic areas limited to the pancreas, located at the junction of the pancreatic body and tail, suspicion of malignancy. It was reported that there was no suspicion of invasion in the celiac truncus and branches, portal vein, superior mesenteric artery and splenic hilus (Figure 2).

Open DP was planned, spleen volume was evaluated as normal during the operation. The lesion defined in the pancreatic body and tail composition was palpated, no in-



vasion to the surrounding tissue or adhesion secondary to inflammation was observed. It was decided to perform SPDP surgery with the Warshaw technique. Pancreas body-tail superior and inferior borders were dissected. The proximal part of splenic artery was ligated after branching from the celiac truncus. Distal end of the splenic artery was ligated away from the splenic hilus with the splenic vein after the tail of the pancreas was released and transected. By not dissecting the splenic ligaments, collateral blood flow of the spleen, short gastric vessels and left gastrointestinal artery flow were preserved. The pancreatic body was transected with linear stapler, and the parenchyma was sutured in double layer (Figure 3). When the spleen was re-evaluated, no ischemic discoloration or demarcation line was detected (Figure 4). Operation time was approximately 200 minutes, blood transfusion was

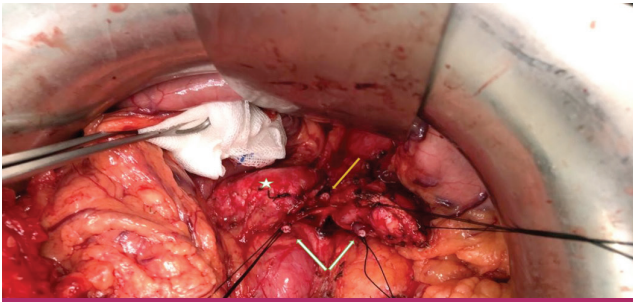


Figure 3. White arrows point to the proximal and distal end of the splenic vein, yellow arrow points the splenic artery transected after branching from the celiac artery.

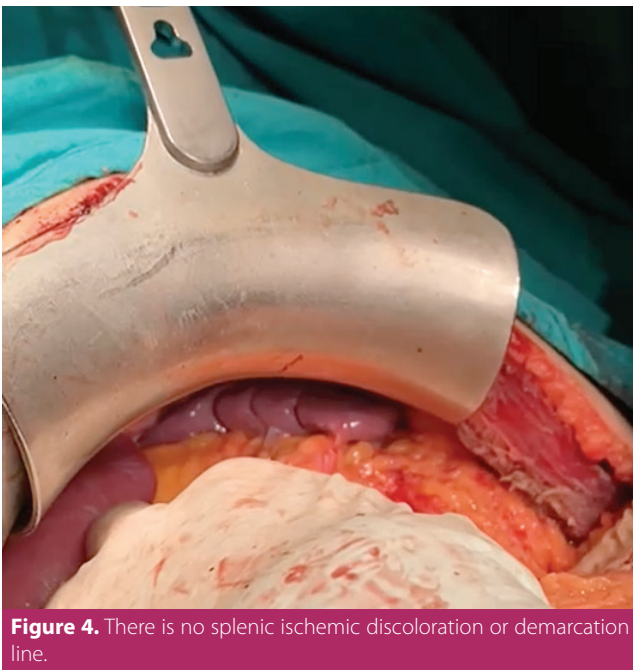


Figure 4. There is no splenic ischemic discoloration or demarcation line.

not needed, and 130 ml of hemorrhagic fluid was aspirated. Splenic perfusion was evaluated with postoperative abdominal ultrasonography and computed abdominal tomography angiography, no ischemic changes or congestion were reported (Figure 5). The patient was discharged without any complications after removing the drain on postoperative day 5. Pathology result was reported compatible with chronic pancreatitis.

DISCUSSION

Since the splenic vessels are close to the pancreas, it seems to be an advantage from an oncological point of view, especially in pancreatic body tail malignancy surgeries, by performing splenectomy together with the perivascular lymphatics and splenic hilum lymph nodes. However, after splenectomy, abscess may develop in the surgical site, especially in obese patients (7). Post-splenectomy, infection and sepsis may develop due to encapsulated bacteria, and lifetime vaccination is required (1).

In our case, there was no peripancreatic inflammation and invasion as stated in the radiology reports in the preoperative period. The lesion was limited to the pancreas and did not extend to the splenic hilum. Splenic vessel ligation was performed with the Warshaw technique, and SPDP surgery was performed with the surrounding lymphatics. The duration of the operation and the amount of bleeding were consistent with the literature data (8).

Retrospective studies and meta-analyses have revealed the superiority of Warshaw and Kimura techniques over each other in SPDP surgery. A shorter operation time and less blood loss are expected in the Warshaw technique (9). On the other hand, splenic infarction, abscess and gastric varice development are more common (10-12).

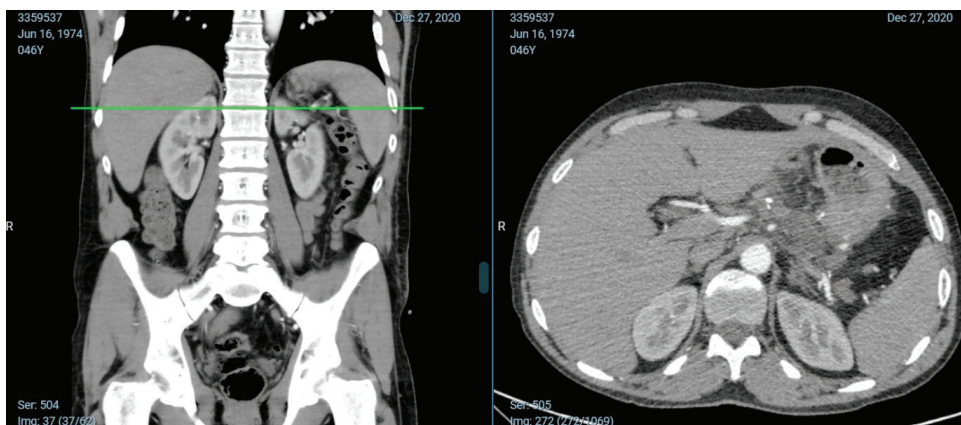


Figure 5. Postoperative contrast enhanced abdominal tomography, there is no splenic infarction or congestion.

Andrew Warshaw and his colleagues have reported partial splenic blood supply disorder and infarction in 23% of 158 patients in their long-term follow-up study, and 1.9% of the patients have undergone splenectomy. Upper gastrointestinal bleeding due to perigastric varices has not been reported (13). No significant difference has been found between the need for postoperative blood transfusion, development of pancreatic fistula, need for re-operation, and length of hospital stay (14,15).

In our case, no thrombocytosis or any other disorder developed in postoperative blood counts. In the radiological imaging reports, there was no blood supply disorder in the spleen, and the drain was serous. On postoperative day 5, the drain of the patient was removed and the patient was discharged without any complications.

CONCLUSION

In the SPDP Warshaw technique, in which the splenic vessels are ligated, the volume of the spleen and numerical variability of the collateral vessels play a major role in the continuity of the blood supply of the spleen. After pancreatectomy, it should be evaluated whether discoloration or demarcation line occurs in the poles of the spleen again intraoperatively. As a result, considering the data on both techniques, the Warshaw procedure is faster, shorter, and less blood loss occurs. Splenic partial infarction and gastric varices may develop at a level of negligible results. The fact that there was no significant difference between postoperative bleeding and pancreatic fistula development, need for re-operation, and length of hospital stay indicates that both techniques can be performed safely according to the clinicopathological characteristics of the patient and experience of the surgeon.

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