

# Successfully Management of Post Traumatic Pancreatic Fistula with Pancreatic Stent Application

Travma Sonrası Meydana Gelen Pankreatik Fistülün Pankreatik Stent Uygulanması ile Başarılı Bir Şekilde Yönetilmesi  
Genel Cerrahi

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## Özet

Postoperatif Pankreatik Fistül (POPF), pankreas ile ilişkili cerrahi sonrası korkulan ve zararlı bir komplikasyondur. En yaygın olarak pankreas kanalı fistülü pankreas cerrahisinden sonra ortaya çıkar, ancak nadiren splenik fleksura ve dalağın cerrahi müdahalelerinden sonra da ortaya çıkabilir. Bu komplikasyonlar için, konservatif tedavi, endoskopik ve perkütan tedavi ve cerrahi tedavi gibi farklı tedavi yaklaşımları uygulanmaktadır. Bu çalışmada sol hipokondriumdan bıçaklanma sonrası splenik fleksura perforasyonu gelişen 65 yaşında erkek hastayı sunmayı amaçladık. Segmental kolon rezeksiyonu ve uç kolostomi yapıldı. Ameliyat sonrası 5. günde pankreatik fistül meydana geldi ve Endoskopik Retrograd Kolanjiyopankreatografi (ERCP) ile pankreas kanalına stent takıldı ve başka bir cerrahi müdahale yapılmadan pankreas kaçağı başarıyla tedavi edildi.

**Anahtar kelimeler:** POPF, Pankreas Kanalı Stentleme, Pankreas Kuyruk Yaralanması

## Abstract

Postoperative Pancreatic Fistula (POPF) is a feared and harmful complication after pancreas-related surgery. Most commonly pancreatic duct fistula occurs after pancreatic surgery, but may also present rarely after trauma or surgical interventions of the splenic flexure and spleen. Different approaches are performed for these complications, such as; conservative treatment, endoscopic and percutaneous treatment, and surgical management. In this study, we aimed to present a 65-year-old male with colon splenic flexure perforation after stabbed injury, from left hypochondria. Segmental colon resection and end colostomy were performed. Postoperative 5th day, pancreatic fistula occurred and pancreatic duct stenting by Endoscopic Retrograde Cholangiopancreatography (ERCP) was performed and pancreatic leakage was successfully treated without another surgical intervention.

**Keywords:** POPF, Pancreatic Duct Stenting, Pancreas Tail Injury

## Introduction

A fistula is defined as an abnormal connection between two epithelium-lined surfaces. Pancreatic fistulas are a remaining significant complication of pancreas-related surgeries or pancreas diseases like acute or chronic pancreatitis. POPF is the leakage of pancreatic fluid out of the pancreatic duct following an abdominal surgical procedure<sup>1-3</sup>. Pancreatic fistulas are most frequently observed after pancreatic surgery, especially the distal pancreatectomy procedures<sup>4</sup>. Drain amylase levels are used to diagnose the intraabdominal pancreatic leakage<sup>5</sup>. However pancreatic fistula can result from iatrogenic pancreatic trauma which may occur during splenic surgery, left adrenal or left renal surgery, or mobilization of the splenic flexure of the colon. POPF frequency varies between %5 and up to %45 according to the performed-surgical procedure<sup>4,6</sup>. Whereas this clinical situation may present asymptotically with biochemical leakage, but also may lead to further complications like intra-abdominal infections, abscess, hemorrhage, sepsis even death<sup>3,7</sup>. Many different definitions and classifications were described for pancreatic fistulas before. In 2016, the International Study Group of Pancreatic Fistula (ISGPS) updated the POPF classification, which was developed in 2005<sup>8</sup>. According to this classification, POPF has been defined as measurable fluid output with amylase activity greater than 3 times the upper normal serum via an operatively placed drain<sup>7</sup>.

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Grade BL contains the patients who have only measurable leakage from the abdominal drain which does not cause any changes to the clinical condition of the patient. In this situation there is no need for deviation in the normal postoperative follow-up and the patient may feed orally if the clinical situation is observed well. Even the patient may be discharged with the abdominal drain for observation for three weeks<sup>9</sup>. Grade B involves patients who have drain leakage and relevant complications with this clinical situation. Infection signs without organ failure occur, thus management changes may be needed from routine postoperative follow-up. The drain might be left in place for more than three weeks. Endoscopic or percutaneous interventions might be required. Angiographic procedures might be performed in case POPF-related bleeding occurs. In case of required re-operation, organ failure, or death as a result of clinical instability and sepsis, this is classified as Grade C.

Although it is not recommended, that after pancreatic fistula is diagnosed clinically, radiological screening might be necessary. Contrast-enhanced Computed Tomography (CT) can help to determine the intra-abdominal fluid collection or any other contiguity collections if percutaneous interventions for drainage are necessary<sup>10</sup>.

Management of the POPF should be done with a multidisciplinary assessment. Although the pancreatic fistulas close spontaneously without the need for operative intervention with the rate of 70% to 82%, in some cases, other interventions or surgical approaches might be needed<sup>2</sup>.

First, most POPF patients are needed feeding support. POPF patients present with significant nausea, anorexia, and the inability to oral intake tolerance<sup>2</sup>. And also POPF patients' oral intake should be avoided for the purpose to keep pancreatic secretions minimally which is simulated by Gastrointestinal (GI) tract secretions<sup>11</sup>. POPF patients are also accepted in the catabolic process. In addition, pancreatic fistula secretion loss is a reason for fluid and electrolyte imbalance, especially in case of high output of the fistula is existing (>200 mL/day)<sup>10</sup>. Consequently, POPF patients may require total parenteral nutrition (TPN) and intravenous hydration for nutrition and replace the lost fluid and electrolytes<sup>2</sup>.

Somatostatin is a gastrointestinal enzyme that inhibits pancreatic exocrine, biliary, and small bowel secretions and increased water absorption. Thus, somatostatin analogs like octreotide are used to reduce the amount of the digestive fistula outputs<sup>10,11</sup>. But some research showed that octreotide has no significant effect on the improvement in the rate of fistula closure<sup>12</sup>.

Patients who have leakage from the tail of the pancreas following distal pancreas injury or distal pancreatectomy may benefit from ERCP<sup>10</sup>. ERCP is a diagnostic and therapeutic procedure that may help to visualize the pancreatic duct and explore the injured part of it, and also an opportunity for the stenting of the duct<sup>2</sup>. Decompressing the pancreatic duct and promoting the antegrade flow of pancreatic fluid is attempted by this procedure. Pancreatic duct stenting returns the flow of pancreatic secretions into the duodenum rather than through the duct disruption<sup>11</sup>. The experience with this technique is reported limited and advised to be employed in highly-selected patients<sup>10</sup>. Placed stents are suggested to be retrieved 10–14 days after external fistula closure commonly. The most commonly occurred complications are stent migration, stent occlusion, and localized duct inflammation<sup>1</sup>.

Although most of POPF patients are treated with conservative approaches, surgical interventions might be needed in some cases. Operative intervention is considered in the case of septic intra-abdominal collections inaccessible to percutaneous or endoscopic drainage, suspected peritonitis by visceral perforation, and necrosis<sup>10</sup>.

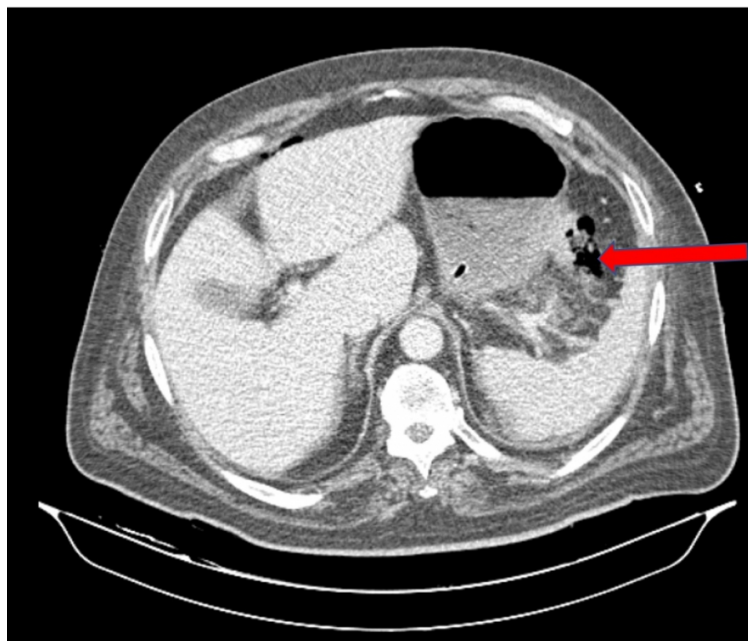
## Case Report

In this study, we present a 65-year-old male who was admitted to emergency service with a stabbed wound in the left hypochondria. As free fluid and air were detected in the abdominal CT scan (Figure 1A, 1B), the laparotomy

for abdominal exploration was decided with intra-abdominal perforation suspicion.



**Figure 1A**  
Intraabdominal collection



**Figure 1B**  
Intraabdominal free air

Left diaphragm injury and large bowel perforation were observed during intraabdominal exploration. Upon this left thoracic drainage, and diaphragm repair were performed. Release of the splenic flexure and end colostomy was planned for the colonic perforation. Descending colon was started to release from the lateral side of the abdominal wall by cutting the white line. Splenic flexure was released following sharp and blunt dissections which were carried forward up to splenic flexure. The duodenum and tail of the pancreas were seen and protected while dissecting the splenic flexure. After the dissection of the left colon was completed distal part was stapled

with an 80 mm linear stapler by leaving the perforation area on the proximal side. Afterward, an aperture was formed on the left upper side of the abdominal wall for the Hartman colostomy procedure and the distal part of the colon was taken out and generated end colostomy. Subsequently, the patient's infection markers increased during the postoperative follow-ups. After other possible infection reasons were excluded like pneumonia, urinary tract infection, or surgical site infection, the abdominal drain outcome was observed purulent which was placed on the left para-colic side of the abdomen. Measurement of the drain amylase and lipase level resulted in 3 times higher than the serum amylase and lipase. Thus, oral intake of the patient was stopped, TPN was started, antibiotic treatment was revised and conservatively follow-up the patient was decided. After three weeks of follow-up, there was no significant reduction in the drain outcome and the amylase and lipase levels were still high. Contrast-enhanced CT was performed (Figure 2) and the fluid collection around the spleen was detected.



**Figure 2**  
Post-operative perisplenic fluid collection

After consulting the patient with the gastroenterology department, ERCP and pancreatic duct stenting were decided. ERCP and endoscopic pancreatic duct stenting were performed successfully. Oral feeding was started one day after ERCP, and the drain amount was started to reduce. One week later drain outcome was stopped and we took off the drain. Thus, the pancreatic fistula was controlled and treated successfully by endoscopic pancreatic duct stenting. The patient was discharged with health two weeks after ERCP and pancreatic duct stenting. Control CT (Figure 3) was taken one month later and there was no fluid collection in the abdomen.



**Figure 3**  
Abdominal CT scan after treatment

The pancreatic duct stent was taken out three months later.

## Case Discussion

Despite the improvement of the surgical technique and the perioperative care of the patients, POPF is remaining the main source of major morbidity and mortality after pancreatic surgery between 13% and 41% of patients<sup>4</sup>. The management of any patient with a pancreatic fistula should be individualized<sup>1</sup>. Because of the complexity of pancreatic leak patients, it is suggested to be managed POPF patients with a multidisciplinary team comprised of gastroenterology, interventional radiologists, and surgeons<sup>3</sup>. It is important to clarify the fistula definition concerning fluid amount, enzyme content, and duration of the secretion, and to correlate these results with the clinical symptoms to evaluate their impact on the patients' condition and to stratify risk levels for possible complications<sup>4</sup>. Because, POPF is associated with morbid sequelae including intra-abdominal sepsis and hemorrhage, carrying a mortality risk of 1% for all patients with POPF<sup>9</sup>. Nutritional support and radiological visualization of the pathological site are important. Most of the patients respond to conservative management<sup>1</sup>. In addition to supportive care, some pancreatic fistulas require further intervention with endoscopic therapy or operative management. Endoscopic therapy is usually the preferred method for many pancreatic fistulas. With an ERCP, sphincterotomy and/or placement of a pancreatic stent is performed to promote the flow of pancreatic secretions into a chosen internal drainage route. Therefore, this will decrease the flow through the fistula tract and facilitate fistula closure<sup>13</sup>.

As a result, in this study, we aimed to emphasize the effectiveness of the management of the postoperative pancreatic fistula in this case report. Conservative follow-ups should be the first choice if the patient's clinical situation is available as described in Grade BL and Grade B. Endoscopic procedures, such as endoscopic sphincterotomy and pancreatic duct stenting should be the next step choice if conservative treatment is not given a sufficient result in 4 or 6 weeks in these patients. Most of these patients who have undergone endoscopic interventions are treated well with health successfully without any other surgical procedure needed. We had successful results in our patient as convenient with the literature.



## Informed Consent

From the patient himself

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