

## Brief Clinical Report

# Laparoscopic Management of a Pancreatic Pseudocyst

CONSTANTINE T. FRANTZIDES, M.D., Ph.D., KIRK A. LUDWIG, M.D., and  
PHILIP N. REDLICH, M.D., Ph.D.

### INTRODUCTION

PANCREATIC PSEUDOCYSTS OCCUR IN APPROXIMATELY 10% of patients after an attack of acute alcoholic pancreatitis.<sup>1</sup> The natural history of pseudocysts is related partly to the size of the fluid collection,<sup>1,2</sup> but overall, it can be said that nearly 50% of all patients with pseudocysts can be managed safely without surgical intervention.<sup>3</sup>

When a pseudocyst does not resolve spontaneously, some action is taken based on the clinical setting, the symptoms, and the presence or absence of complications. Although this action required laparotomy in the past, percutaneous<sup>4</sup> and endoscopic<sup>5</sup> means of pseudocyst management recently have been described. The advent of new technologies in minimally invasive surgery allows another option that can be offered. We report a case of internal drainage of a pancreatic pseudocyst using laparoscopic techniques.

### CASE REPORT

The patient is a 34-year-old white man with a history of alcohol and drug abuse who was admitted in October 1990 with acute pancreatitis. On CT scan of the abdomen, the patient was found to have extensive pancreatic necrosis and peripancreatic fluid. During a month-long admission, he developed a 12 × 5 × 5 cm pancreatic pseudocyst, which was managed by percutaneous drainage and subsequently resolved over the following 45 days.

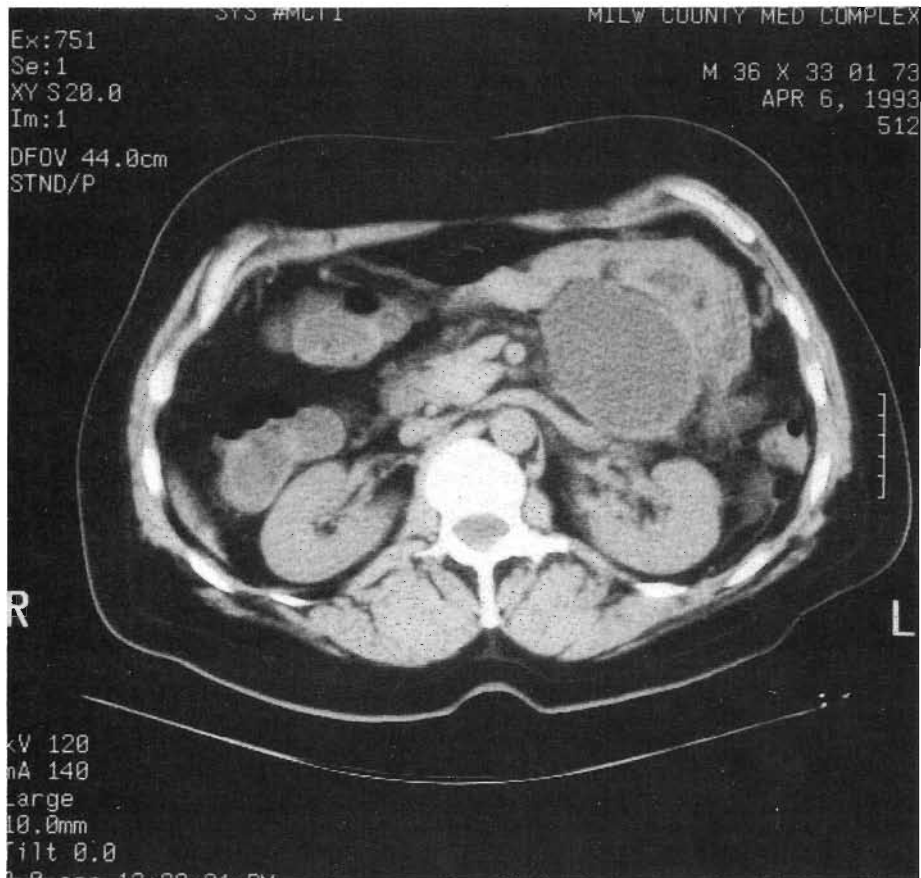
The patient was pain free for approximately 16 months. He began to abuse alcohol again and, in August 1992, began complaining of epigastric pain. In March 1993, he was readmitted to the hospital with malaise, epigastric pain, and poor appetite. A repeat CT scan showed a 6 × 9 × 11 cm pseudocyst over the body of the gland in the root of the mesentery (Fig. 1). An ERCP showed an abrupt end of the pancreatic duct at the junction of the head and body of the gland. Percutaneous drainage of the pseudocyst could not be undertaken because of overlying transverse colon. Therefore, on April 15, 1993, the patient underwent a laparoscopic cystjejunostomy.

The patient was placed on the operating table in the supine position, with the surgeon on the patient's right and the first assistant on the patient's left. The camera operator stood behind the surgeon on the patient's right.

The laparoscope was placed through an infraumbilical trocar. Additional trocars were placed in the midclavicular lines on the right and left at the level of the umbilicus. Two more trocars were placed in the midclavicular lines on the right and left in a subcostal position. Using Babcock graspers and especially designed inflatable retractor (Cabot Medical, Langhorne, PA), the pseudocyst was exposed at the base of the transverse mesocolon close to the ligament of Treitz (Fig. 2). The pseudocyst was punctured with a

---

Department of Surgery, Medical College of Wisconsin, Milwaukee, WI.



**FIG. 1.** CT scan of the abdomen showing 6 × 9 × 11 cm pseudocyst over the body of the pancreas in the root of the mesentery and the transverse mesocolon.

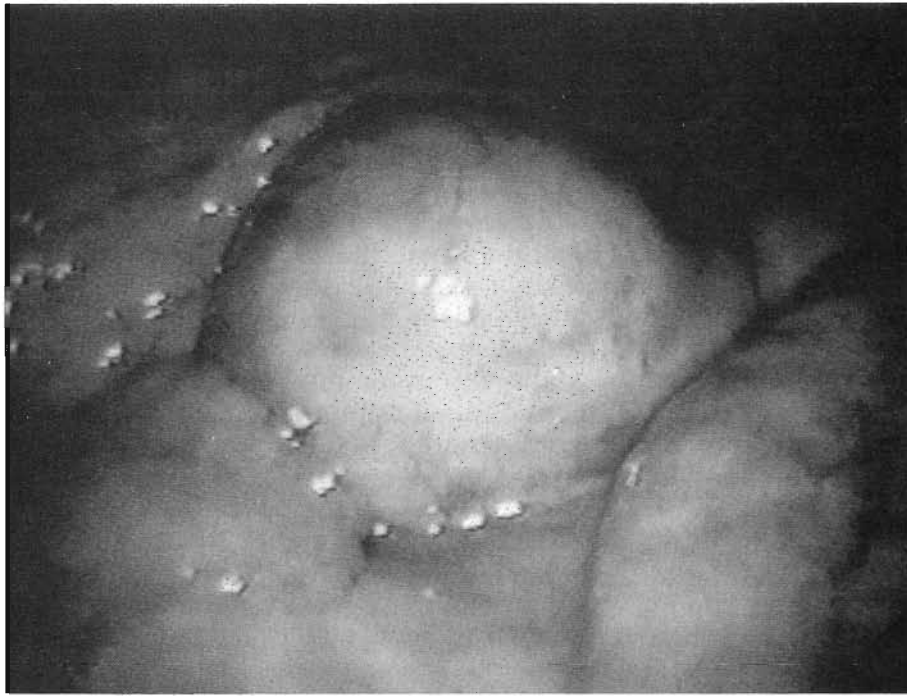
laparoscopic needle, and contrast medium was injected. The location and extent of the pseudocyst were confirmed by fluoroscopy. After location of the jejunum at the ligament of Treitz, a segment of proximal jejunum was selected for anastomosis to the pseudocyst. The jejunum was anchored to the inferior wall of the pseudocyst with a running 3-0 braided nylon suture. A 1 × 1 cm segment of the pseudocyst wall was excised and sent for frozen section histology to confirm its benign nature. An enterotomy was made in the loop of jejunum, and the stapling device was introduced into the lumen of both the cyst and the small bowel to create the anastomosis. The laparoscope was advanced into the pseudocyst to inspect the stapled anastomosis and explore the pseudocyst. The enterotomy and the cystotomy were subsequently closed with interrupted 3-0 braided nylon sutures in two layers (Fig. 3).

A 6 cm transverse skin incision was made in the left upper quadrant, and the loops of jejunum proximal and distal to the anastomosis were exteriorized, and a side-to-side handsewn enteroenterostomy was performed (Fig. 3). After completion of this anastomosis, the loops of intestine were reduced into the abdomen, the incision was closed, and pneumoperitoneum was reestablished. The abdomen was irrigated, and a drain was placed through the right subcostal port. Trocars were removed, and the incisions were closed.

On postoperative day 1, the nasogastric tube was removed, and clear liquids were started. On postoperative day 2, the drain was removed, and the patient tolerated a regular diet. The patient was discharged to home on postoperative day 3 in good condition.

Three weeks after operation, an upper gastrointestinal and small bowel series were performed that showed contrast medium filling the jejunal loop to the cyst and a patent jejunojejunostomy. Contrast medium did not enter the pseudocyst.

## LAPAROSCOPIC CYSTJEJUNOSTOMY



**FIG. 2.** Laparoscopic view of the pseudocyst as it protruded through the transverse mesocolon. The transverse colon and the greater omentum have been retracted anteriorly and cephalad.



**FIG. 3.** Diagram of the anatomy at completion of operation with cystjejunostomy and enteroenterostomy completed. Arrows demonstrate direction of cyst fluid and small bowel content flow.

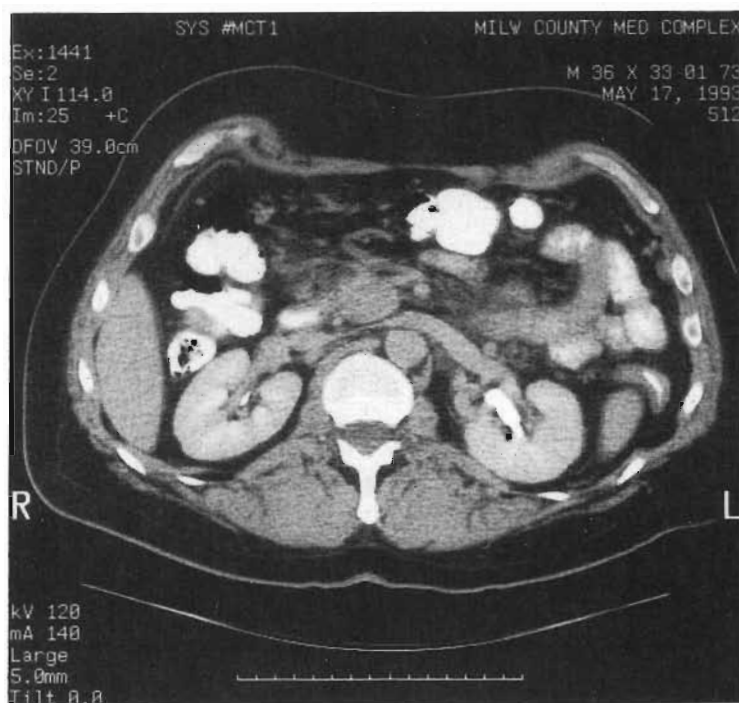
Four weeks after operation, a CT scan of the abdomen showed complete resolution of the pseudocyst (Fig. 4). The patient remains in good condition and without recurrent pancreatitis and has returned to full employment.

## DISCUSSION

This case report illustrates the usefulness of a laparoscopic approach to manage a problem that previously would have required a formal laparotomy with concomitant prolonged hospital stay, morbidity, and 4–6 week convalescence. In this case, the patient was taking a regular diet on postoperative day 2, required minimal pain medication in the postoperative period, and was discharged to home on postoperative day 3. He returned to normal activities within 2 weeks. This type of accelerated recovery is consistent with that seen after other major intraabdominal procedures performed using laparoscopic techniques.<sup>6–8</sup>

The operation performed is not new. The approach has simply been changed. Although cystgastrostomy and cystduodenostomy can be used for internal drainage of pseudocysts, cystjejunostomy is the most versatile drainage procedure<sup>9</sup> and is indicated for the drainage of pseudocysts of various sizes in many locations. The success of the internal drainage procedure rests primarily with the creation of adequate drainage. It should make little difference whether this is accomplished through a laparotomy or through stab incisions using a laparoscope.

Classically, the cystjejunostomy is performed using a Roux-en-y limb. Although this type of drainage could have been used here, the loop jejunostomy was chosen because it allowed for a simple and quickly accomplished anastomosis to the pseudocyst using the laparoscopic stapling device. The theoretic possibility of gastrointestinal contents contaminating the pseudocyst through the anastomosis was avoided by the construction of a diverting enteroenterostomy. This type of loop diversion is well known and is used frequently for biliary diversion during cholecystojejunostomy.<sup>10</sup> Again, for simplicity, the enteroenterostomy was performed through a limited left upper quadrant incision. The small bowel contrast study obtained on postoperative day 20 verified the patency of the enteroenterostomy and demonstrated no contrast medium



**FIG. 4.** CT scan of the abdomen 4 weeks after operation demonstrating complete resolution of the pseudocyst.

## LAPAROSCOPIC CYSTJEJUNOSTOMY

filling the pseudocyst. Technically, this operation requires some degree of familiarity with intra- and extracorporeal suturing techniques as well as the use of the laparoscopic stapling device. As is true with any procedure that requires intracorporeal suturing, this technical exercise is made easier by placing trocars such that the suturing is being performed at a right angle to the laparoscope. In this case, the laparoscope was flanked by the needle holder and the grasper, which is technically the preferred positioning. Obviously, trocar placement can be adjusted easily based on the location of the pseudocyst determined by preoperative imaging and intraoperative exploration.

With regard to the development of new laparoscopic techniques, it has been stated that "because we can, doesn't mean we should." We agree, but when the same procedure performed in the standard fashion can be performed laparoscopically, the new technology should be approached with an open, yet cautious mind. In this case, the primary goals of an adequate open internal pseudocyst drainage procedure have been achieved laparoscopically: the wall of the pseudocyst was biopsied to confirm its benign nature, dependent drainage was provided, and as evidenced by follow-up imaging, the pseudocyst completely resolved.

### REFERENCES

1. O'Malley VP, Cannon JP, Postier RG: Pancreatic pseudocysts: Cause, therapy and results. *Am J Surg* 1985;150:680-682.
2. Beebe DS, Bublick MP, Onstad GR, et al: Management of pancreatic pseudocysts. *Surg Gynecol Obstet* 1984;159:562.
3. Yeo CJ, Bastidas JA, Lynch-Nyhan A, et al: The natural history of pancreatic pseudocysts documented by computed tomography. *Surg Gynecol Obstet* 1990;170:411-417.
4. Adams DB, Anderson MC: Percutaneous catheter drainage compared with internal drainage in the management of pancreatic pseudocyst. *Ann Surg* 1992;215:571-576.
5. Dohmoto M, Rupp KD: Endoscopic drainage of pancreatic pseudocyst. *J Surg Endosc* 1992;6:118-124.
6. Stein HJ, Feussner H, Siewert JR: Minimally invasive antireflux procedures. *West J Surg* 1992;16:347-348.
7. Soper NJ, Barteau JA, Clayman RV, Ashley SW, Dunnegan DL: Comparison of early postoperative results for laparoscopic versus standard open cholecystectomy. *Surg Gynecol Obstet* 1992;174:114-118.
8. Frantzides CT, Ludwig KA, Quebbeman EJ, Burhop J: Laparoscopic highly selective vagotomy. *Surg Laparosc Endosc* 1992;2:348-352.
9. Neivell KA, Liu T, Aranha GV, Prinz RA: Are cystogastrostomy and cystojejunostomy equivalent operations for pancreatic pseudocysts? *Surgery* 1990;108:635.
10. Hoover H Jr: Pancreatic and periampullary carcinoma (nonendocrine). In: Turcotte JG (ed): *Surgery of the Alimentary Tract*, 3rd ed. Philadelphia: WB Saunders Co. 1991, vol 3.

Address reprint requests to:  
*Constantine T. Frantzides, M.D., Ph.D.*  
*Associate Professor of Surgery*  
*Medical College of Wisconsin*  
*Froedtert Memorial Lutheran Hospital*  
*9200 West Wisconsin Avenue*  
*Milwaukee, WI 53226*