

# Percutaneous treatment of Wirsung's duct stenosis secondary to chronic pancreatitis: balloon dilatation and insertion of a plastic stent

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## ABSTRACT

Chronic pancreatitis is one of the indications for pancreatic duct stenting. The success rate of endoscopic stenting of the pancreatic duct is very high (98%). Reports of percutaneous stenting of the Wirsung's duct are very sparse. We present a case with Wirsung's duct stenosis secondary to chronic pancreatitis, which was treated by percutaneous antegrade balloon dilatation and insertion of a plastic stent. We also report on the long-term follow-up of this patient.

**Key words:** • Wirsung's duct • angioplasty, balloon • stents

**T**raditional treatment of pancreatic duct stenosis is surgical (1). More recently, plastic stents have come into use, applied via endoscopic approach (1, 2). The success rate of endoscopic stenting of the pancreatic duct is as high as 98.6% (3). Catheterization of the pancreatic duct is almost always carried out via endoscopic approach, but percutaneous pancreatic duct catheterization can be performed when endoscopy fails, or when it is impossible to reach the pancreatic duct due to postoperative anatomical changes (2). Indications of pancreatic duct stenting are the treatment of pain due to chronic pancreatitis or pancreatic cancer and post-operative anastomotic stenoses (2).

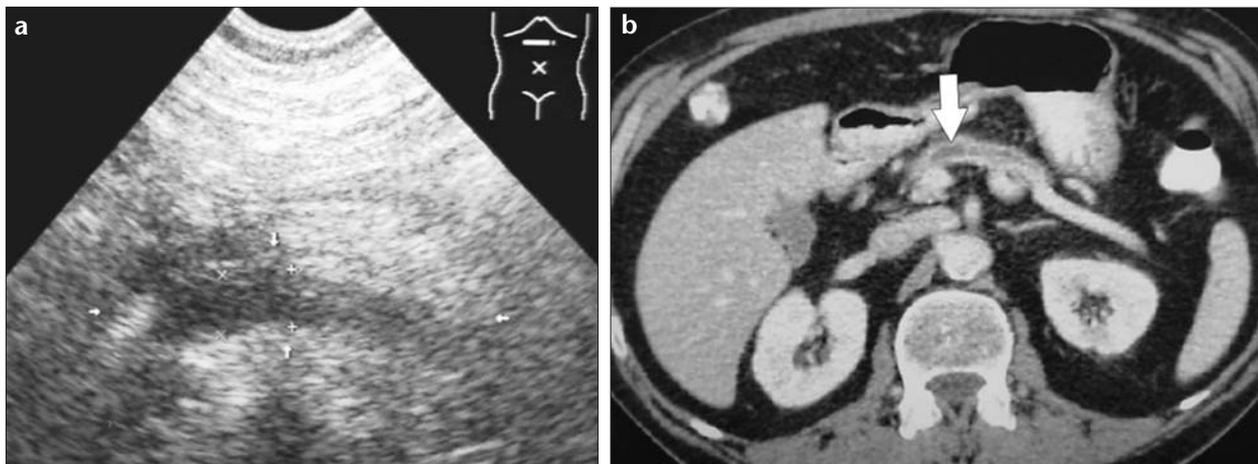
There are few reports of the percutaneous stenting of the Wirsung's duct as endoscopic stenting is associated with immediate pain relief in 94% of cases and long-term benefit in chronic pancreatitis in 64% of cases (2). We present a case with Wirsung's duct stenosis secondary to chronic pancreatitis, which was treated by antegrade balloon dilatation and insertion of a plastic stent.

## Case report

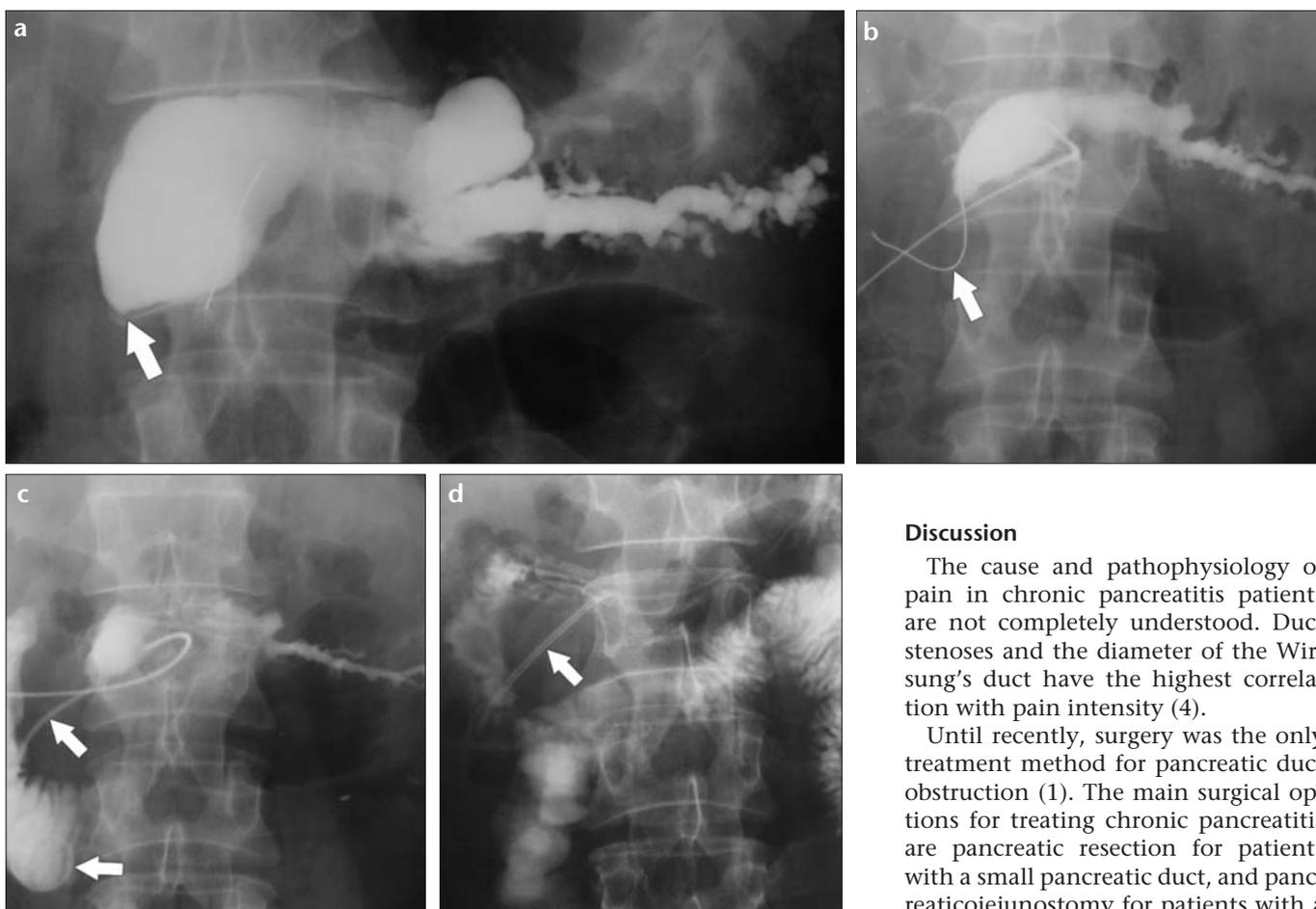
A 61-year-old male patient presented with chronic epigastric pain, which had increased during the previous few weeks. Abdominal ultrasonography and computed tomography (CT) revealed a cystic tubular structure localized in the lesser sac, which was thought to be an extremely dilated Wirsung's duct, 11 mm in diameter (Figure 1). Endoscopic stenting of the Wirsung's duct was attempted, but was unsuccessful. The papilla of Vater could not be catheterized during the endoscopy. The patient was then informed about a percutaneous procedure, its alternatives, and potential risks. Following patient consent, the procedure was performed under ultrasonographic and fluoroscopic guidance. The Wirsung's duct was punctured with an 18 G Seldinger needle under ultrasonographic guidance via transperitoneal route. Percutaneous puncture, aspiration, and infusion of contrast agent confirmed the presence of a huge dilatation of the Wirsung's duct due to a solitary stricture in a retro papillary location. A 0.035 inch hydrophilic guidewire was passed through the stricture into the duodenum. A 7F introducer sheath was used for balloon dilatation and stent placement. Balloon dilatation of the stenotic segment was performed via a balloon 10 mm in diameter and 7 cm long. A 7F plastic stent was percutaneously placed at the site of the stenosis (Figure 2). The entire catheter system was removed after placement of the stent. This procedure was performed entirely in a single session. Immediate pain relief was observed. Seventeen days after the procedure, endoscopic retrograde cholangiopancreatography (ERCP) was performed and the stent was removed by an endoscopist. No procedure-related complication was encountered. During a 6-year follow-up, symptomatic relief was observed. The patient was followed-

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**Figure 1. a, b.** A dilated Wirsung's duct is demonstrated with ultrasonography (a); pancreatic borders are marked by arrows, diameter of the Wirsung's duct is measured by "+" and "x" signs. Wirsung's duct dilatation can also be seen on CT examination (b); dilated Wirsung's duct in the pancreatic body is pointed (arrow).



**Figure 2. a-d.** During the interventional procedure, the Wirsung's duct was punctured and contrast material was infused. Obstruction at the opening of the Wirsung's duct is demonstrated (a) (arrow). A guide wire (arrow) was introduced into the duodenum through the stricture (b). A catheter (arrows) was introduced into the duodenum (c). The plastic stent (arrow) can be seen between the Wirsung's duct and duodenum (d).

up with abdominal sonography and CT, which demonstrated a significant decrease in the diameter of the Wir-

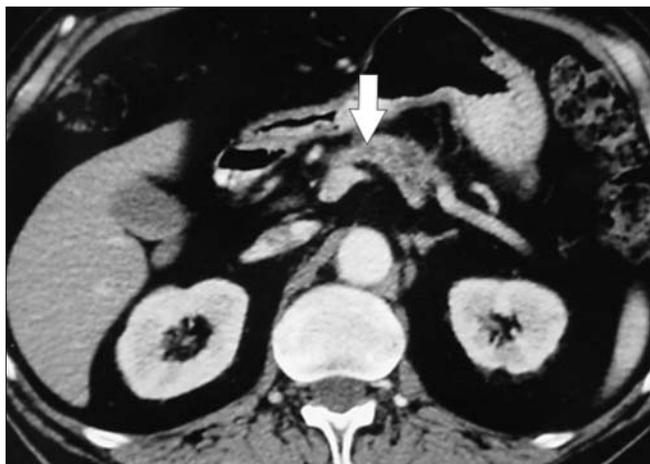
sung's duct to 5 mm (Figure 3). There was no regression of pancreatic function during the follow-up period.

## Discussion

The cause and pathophysiology of pain in chronic pancreatitis patients are not completely understood. Duct stenoses and the diameter of the Wirsung's duct have the highest correlation with pain intensity (4).

Until recently, surgery was the only treatment method for pancreatic duct obstruction (1). The main surgical options for treating chronic pancreatitis are pancreatic resection for patients with a small pancreatic duct, and pancreaticojejunostomy for patients with a dilated pancreatic duct (5). The rate of pain relief following surgical treatment of chronic pancreatitis by side-to-side pancreaticojejunostomy or subtotal pancreatectomy is 65% or higher. It is also associated with a 10% morbidity rate and a 4% mortality rate (2).

Denervation of pancreatic sympathetic pain afferents has also been suggested as an alternative in the



**Figure 3.** Abdominal CT 6 years after the interventional procedure demonstrates a significant decrease in the size of the Wirsung's duct (arrow).

treatment of pain in chronic pancreatitis patients (6). Various neural block/ablation techniques (medical, endoscopic, radiological, and surgical) have been described in the literature (7).

Endoscopic treatment of pancreatic duct stenosis has been developed during the last 20 years and is currently the primary treatment option (2, 8). Balloon ductoplasty is not generally performed alone since it is associated with frequent recurrence (2). Plastic stents can be used, but clogging appears to be a major problem, which leads to the frequent need of replacement (2, 8). After endoscopic stenting of an obstructed main pancreatic duct in chronic pancreatitis, immediate pain relief was noted in 94% of the patients, 74% and 64% had complete or partial pain relief, at 6 months and at 4.9 years, respectively (2, 3). Endoscopic stenting of the pancreatic duct is relatively free of complications (9), although cholangitis, hemorrhage, infected pseudocyst, biliary fistula, abscess, and pyelophlebitis have been reported (2). It is also argued that pancreatic sphincterotomy and short term nasopancreatic drainage are safe and effective alternatives to stenting (2).

Endoscopic ultrasonography-guided antegrade pancreatography with stent placement may also be an alternative to endoscopic retrograde pancreatography when surgical reconstruction precludes access to the papillae (10).

Percutaneous pancreatic duct catheterization can be performed when endoscopy fails, or when it is impossible to reach the pancreatic duct due

to postoperative anatomical changes (2). Percutaneous pancreatic stenting is reported in patients with acute and chronic pancreatitis (1, 11). Plastic or metallic stents can be used (1, 2, 11). Although metallic stents have been used widely for malignant biliary obstruction, clinical experience with their use in pancreatic ducts is very limited (1, 2). Blockage of a metallic stent can be treated by subsequently placing a plastic stent through it (2). Percutaneous stenting of the pancreatic duct also carries potential complications such as hemorrhage, infection, vascular injury, pancreatic fistula, and peritonitis (2). Resolution of chronic pancreatitis and panniculitis has been reported following pancreatic duct stenting (12). Stenting of the pancreatic duct induces both ductal and parenchymal changes due to chronic pancreatitis in more than 50% of patients (13). The main problem with stenting is that it induces fibrosis (14, 15).

Results of endoscopic stenting of obstructed main pancreatic ducts in patients with chronic pancreatitis were noted as satisfactory in the literature (3, 12). We preferred to insert a plastic stent into the main pancreatic duct of our patient after percutaneous balloon dilatation. We have followed-up our case for six years without noting significant symptoms or dilatation in the Wirsung's duct. Balloon dilatation, short-term plastic stenting of the pancreatic duct and meticulous follow-up can be an alternative treatment in a patient with chronic pancreatitis, thus avoiding surgery.

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