

PANCREATIC STENT

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Abstract

Pancreatic stenting is widely employed after pancreatic sphincterotomy with goals of reducing both early restenosis and post-ERCP pancreatitis. The risk of pancreatitis is significantly decreased when a pancreatic stent is placed and then left in following a precut sphincterotomy

Introduction

Chronic pancreatitis is a progressive, irreversible inflammatory disease characterized by pain, which is the symptom that requires treatment in most cases (*Steer et al., 1995*). This disease is thought to be caused by increased pressure within the pancreatic ductal system and/or pancreatic parenchyma, secondary to the outflow obstruction of the main pancreatic duct (MPD). It has been reported that endoscopic pancreatic duct stenting provides both short-term and long-term relief from persistent or relapsing pain in severe chronic pancreatitis with distal ductal strictures and proximal dilation [3–8]. Several stents of various shapes and diameter have been used for endoscopic pancreatic stenting (EPS) (*Weber et al., 2007*).

Types of pancreatic stents

Pancreatic plastic stents are made primarily of polyethylene materials. Pancreatic stent sizes range from 2 to 25 cm in length and 3F to 11.5F in diameter (**Figure-1**). Pancreatic stents are either straight, curved, wedge, or single pigtail. Most pancreatic stents have side holes throughout the length of the stent to facilitate drainage of the pancreatic side ducts. A winged stent (ViaDuct, GI Supply) allows pancreatic juice to drain around the stent rather than through the stent lumen. Various designs are available depending on the desired duration of stenting. Stents with an internal flange are used for prolonged stenting; stents with no internal flange are used to promote spontaneous migration for short-term stenting. Most pancreatic stents have a mechanism (eg, distal flange, pigtail) to prevent internal migration. Because of the smaller diameter of pancreatic stents, the majority are usually deployed with only a guidewire and pushing catheter. Larger diameter stents (8.5F and larger) are available with kits and an introducer (*Pfau et al., 2013*).

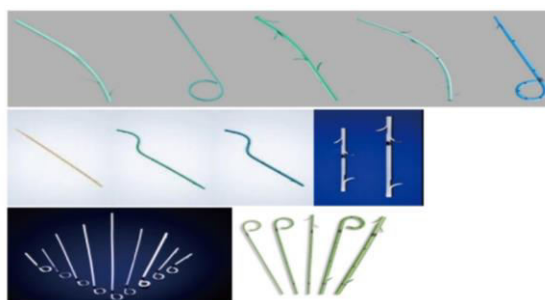


Figure 1: Different types of pancreatic stents (Mangiavillano et al., 2016)

Indications

In general, pancreatic stenting during ERCP should be carefully considered in any patient with SOD and/or prior pancreatitis. Even patients with normal sphincter of Oddi manometry who do not undergo sphincterotomy have a substantial risk for post-ERCP pancreatitis (*Mangiavillano et al., 2016*).

Prevention of post-ERCP pancreatitis.

Two large recent meta-analyses of 680 and 556 patients including 8 randomized, controlled trials showed a significant reduction in mild, moderate, and severe pancreatitis rates with placement of prophylactic pancreatic stents in high-risk patients (e.g, ampullectomy, pancreatic sphincterotomy, precut

sphincterotomy, sphincter of Oddi dysfunction, and difficult cannulations). Most studies used small-diameter (3F-5F), short stents (3-5 cm) with only an external flap or pigtail. (*Choudhary et al., 2011*).

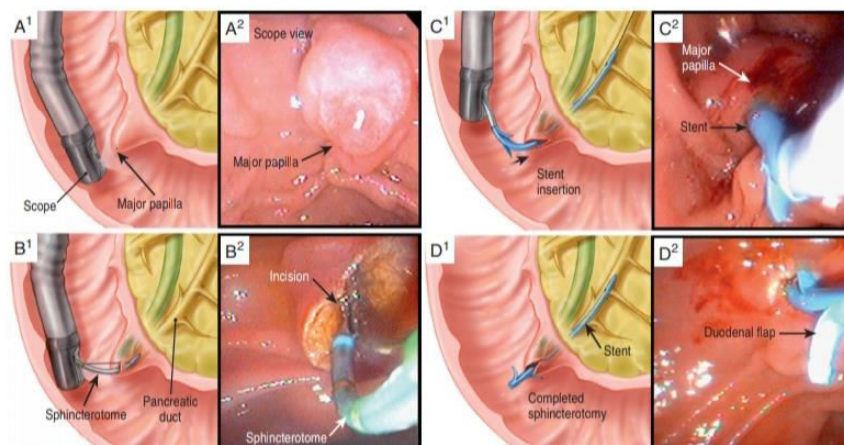


Figure 2: Pancreatic stent insertion. (A) View of the major papilla before pancreatic sphincterotomy. (B) Sphincterotomy performed with the cutting wire angled toward the 2'oclock position. (C) Placement of a pancreatic stent after sphincterotomy. (D) Completion of the sphincterotomy with the stent in good position. (Buscaglia and Kalloo, 2007)

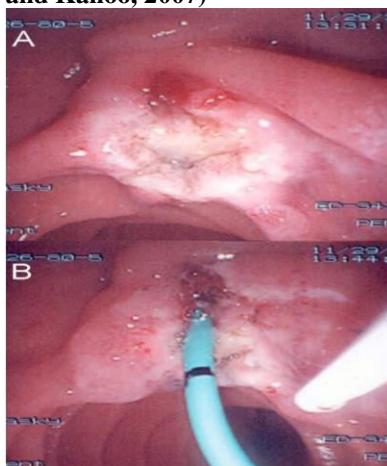


Figure 3: Pancreatic orifice is not obvious after ampullectomy (A). So, a pancreatic stent is placed to ensure drainage (B) (Tarnasky 2003)

Complications of pancreatic stents

The main adverse events of pancreatic stents include migration, stent occlusion, and stent-induced pancreatic ductal changes. Undesired stent migration occurs in 5.2% (proximal) and 7.5% (distal) of cases.¹⁰⁸ Because of the generally smaller diameter stents used in the pancreas, approximately 50% will be occluded by 4 weeks, with the majority occluded by 3 months (*Garcia-Pajares et al., 2010*). Pancreatic ductal changes can occur in as many as 36% to 83% of ducts after stenting for as briefly as 2 to 3 weeks. Ductal changes occur more frequently in patients with a normal pancreatogram before stenting and may be permanent in one third of cases.

Techniques

The first step is selective cannulation of the pancreatic duct. Pancreatic cannulation is usually easy at the main papilla because the angle is more perpendicular to the duodenal lumen. After injection of the bile or pancreatic duct, it can sometimes be difficult to cannulate the other. If the bile duct is accessed first, the septum may push down on the pancreatic orifice making it then difficult to cannulate. In patients at high risk for post-ERCP pancreatitis, it may be prudent to first attempt access to the pancreatic duct, particularly if the indication for ERCP is pancreatic, e.g. pancreatitis or pancreatic type pain thought due to

SOD. Pancreatic sphincterotomy can then be done with a papillotome (over a guidewire then followed by stent placement) or with a needle knife (following placement of a pancreatic stent).

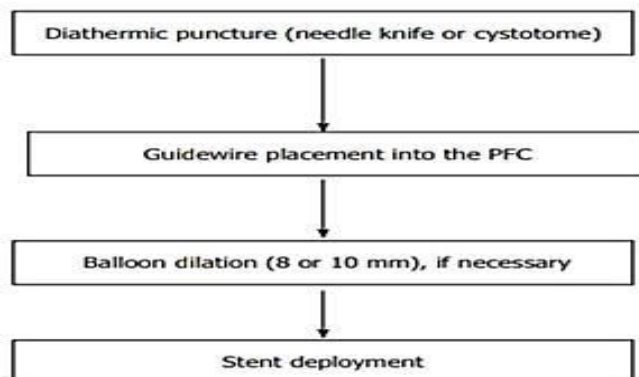


Figure 4: Traditional transluminal endoscopic drainage of pancreatic fluid collections (PFC).(Mangiavillano et al., 2016)

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