Endoscopic Therapy for Chronic Pancreatitis

Nitin Aherrao*, Darshil Shah**

In chronic pancreatitis, therapeutic endoscopy can be considered in different settings: drainage of the pancreatic duct to alleviate pain, pseudocyst drainage, and treatment of biliary obstruction.

Pancreatic Duct Drainage

Introduction

Chronic pancreatitis is a disease characterised by an ongoing inflammatory process with severe pain as the predominant symptom. Although the origin of pain is likely to be multifactorial, pancreatic duct obstruction is considered an important aetiologic factor. Therefore, ductal decompression became standard treatment for patients with painful obstructive pancreatitis.[1,2] Obstruction of the pancreatic duct can be caused by strictures, intraductal stones, or in the majority of cases, by a combination of both. The aim of endoscopic drainage is to decompress the pancreatic duct and restore the outflow of pancreatic juice to the duodenum. It involves sphincterotomy, extracorporeal shock-wave lithotripsy (ESWL), removal of stones, and dilatation of strictures by means of temporary stent insertion.

Procedural Aspects

Pancreatic Duct Stones

Floating stones <5-6 mm in diameter can be extracted transpapillary with a balloon or small-caliber Dormia basket, but the majority of pancreatic stones are impacted and too large to be removed without fragmentation.[3] Specialised equipment consisting of a forceful electromagnetic lithotripter with a fluoroscopic two-directional targeting system. As treatment is painful and time-consuming (a single session takes about 1-2 h), it is best carried out with the patient under general anaesthesia. In the largest retrospective study, a mean of 5 sessions was necessary to achieve complete fragmentation.[8] Consecutive treatment sessions are usually carried out within a few days, during which time the patient remains admitted to the hospital.

ESWL is considered a low-risk procedure with a 5-10% morbidity, acute pancreatitis being the most frequent complication.[8,9] Stone fragmentation is achieved in more than 90% of cases and complete duct clearance in 44-74% of patients.[3,5,6,7] The best results are reported for solitary distal stones in absence of a stricture but multiple, large, and impacted stones are no contraindication.[4]

Pancreatic Duct Strictures

In chronic pancreatitis, fibrotic pancreatic duct strictures require dilatation and temporary insertion of an endoprosthesis.

The sphincterotomy is performed towards the 1-O'clock position and can be extended safely until the first duodenal fold. It should be large enough to allow easy access of instruments and prevent

*Gastroenterologist and Endoscopist, **Resident, Bombay Hospital and Medical Research Centre, 12 New Marine Lines, Mumbai - 400 020.

post-papillotomy stenosis. Either the needle-knife technique over a stent, or a pull-sphincterotomy can be performed, with similar complication rates of 4% in retrospective studies.[8,9] A recent prospective study reported that the Endoscopic Therapy for Chronic Pancreatitis, needle-knife technique was safer, resulting in less post-ERCP pancreatitis.[10] Furthermore, in 5-10% of patients access can only be obtained via the minor papilla either due to a devised pancreas or because of an impassable stenosis of the Wirsung's duct. Most strictures can be passed by a regular or hydrophilic 0.035-inch guidewire although sometimes the use of a thin 0.018- or 0.021-guidewire is necessary. Tight strictures, which cannot be passed by a 5- or 6-Fr guiding catheter, require dilatation, either with a 4- to 6-mm balloon or a graduated dilating catheter. Extremely tight strictures can also be dilated with a Soehendra stent retriever which is passed through the stricture over a non-metallic wire as a corkscrew.

For pancreatic drainage, a range of stents are available. At first, polyethylene biliary endoprostheses were used. Later, stents with multiple side holes were specifically developed for pancreatic use, to allow optimal drainage from the side branches. However, the benefit of these pancreatic stents was never studied and therefore both stent types are used in this setting. Recently, two new model stents have been introduced: these so-called S-shaped and wing-shaped stents are presumed to have a longer patency and less chance of migration.[11-13] Stents have a wide variety in diameters from 3 to 12 Fr. The current trend is to use a stent with the largest possible diameter, and to insert an increasing number of stents with each consecutive procedure to further dilate the stricture in analogy with the treatment of benign biliary strictures.[14-16]

Exchanging the stent on a regular basis has the advantage of preventing recurrent symptoms due to stent obstruction.[17,18] Furthermore, this will limit treatment duration because stricture resolution is frequently evaluated and treatment may be terminated as soon as the obstruction has resolved. A more important reason to limit the treatment duration is the prospective observation that many patients experienced considerable pain during stent therapy, a finding that might even be aggravated if multiple stents are used.[19]

Outcome

There is sufficient data to conclude that endoscopic pancreatic drainage in chronic pancreatitis is technically feasible and safe. Morbidity is observed in 6-58%, but most complications are stent-related and easy to treat.[19, 20-23]

Endoscopic Therapy for Chronic Pancreatitis

Surgical drainage (by a pancreaticojejunostomy according to Partington-Rochele[24] or, in the presence of an inflammatory mass, by a Beger or Frey procedure) achieves long-term pain relief in 65-85% of patients.[25-30] After endoscopic drainage, retrospective studies report a highly variable complete pain relief of 15-84%.[19,21-23] A possible pathophysiological explanation for this finding is offered by

Reber et al.[31] who showed in an animal study that surgery is more effective in alleviating the parenchymal pressure due to the opening of the pancreatic capsule.

Complete or partial pain relief was observed in 32% of patients assigned to endoscopic drainage as compared with 75% of patients who underwent surgical drainage.[19] Moreover, surgery resulted in a more rapid (within 6 weeks) and sustained pain relief during the 2 years of follow-up. For patients in the surgical group treatment consisted of a single intervention (the surgical procedure), while patients assigned to endoscopic treatment underwent a median of 5 therapeutic interventions and suffered considerable pain during this treatment period

Recently a renowned centre for ESWL treatment performed a third prospective randomised trial in which they compared conventional endoscopic treatment consisting of ESWL combined with endotherapy with ESWL alone. After 2 years, pain relapse was observed in 23 of the 55 patients that were randomised (42%) with an advantage of the ESWL alone treatment (38 vs. 45%).[32] Costamagna et al.[14] have reported promising results of cumulative stenting with a success rate of 84%.

In patients with complex pathology (with multiple strictures and stones) endoscopic drainage seems to be inferior to surgery. There is evidence that in symptomatic patients with a single obstruction or stone, the course of the disease may be favourably altered by an early intervention. Farnbacher et al.[33] found that the only parameter predictive of long-term pain relief after endoscopic pancreatic duct drainage was a short duration of disease. Also, animal studies have shown that pancreatic insufficiency develops early in the course of obstructive pancreatitis and becomes permanent within several weeks.[34] Therefore, the best way to prevent irreversible damage and pancreatic function loss may be to decompress the duct at a very early stage. Moreover, even patients without symptoms may benefit from endoscopic drainage.

Summary

In conclusion, recent evidence suggests that surgery offers a better chance of success in patients with extensive obstructive pancreatitis and a combination of strictures and multiple stones. However, this does not write off endoscopic pancreatic duct drainage in chronic pancreatitis. It may well be that patients with less complex pathology will benefit from endoscopic treatment at an early stage of the disease, but this needs to be proven. Moreover, endoscopic therapy may still be justifiable in selected patients with extensive disease who show a favourable pain response within the first 8 weeks of stent treatment. If not, or when stricture resolution is not accomplished after a treatment period of 1-2 years, patients should be referred for surgery.

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40 years of percutaneous coronary intervention: where next?

The newest generation drug-eluting stents show reduced repeat revascularisation and stent thrombosis rates compared with bare-metal stents at 6 years follow-up. The long-term risk of stent thrombosis is lower than the risk of myocardial infarction remote from the stent. To address residual late stent failure due to stent fracture and neoatheroclerosis formation, and to minimise loss of vasomotor function, bioresorbable scaffolds have been tested as the next advance in PCI.

Another continuing area of uncertainty remains the optimum post-PCI anticoagulation strategy.

The optimum length of dual antiplatelet treatment, the potential for switching from the more potent drugs back to clopidogrel, which has a more favourable bleeding risk, and the choice of patients for long-term treatment all remain unclear.

With the strategy of PCI (within 90 minutes of presenting to an emergency department for ST-segment elevation myocardial infarction), anticoagulation, and continued monitoring of coronary patency, remarkable reductions in cardiovascular mortality have been achieved in higher-income countries.

A rising prevalence of risk factors, such as tobacco use, physical inactivity, unhealthy diet, and unrecognised and untreated hypertension, has the potential to dramatically increase the burden of cardiovascular diseases in low-income and middle-income countries, even in younger people.

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