Acute pancreatitis is commonly caused by gall stones or alcohol. However in 10-30% of patients with acute pancreatitis no cause can be established after an initial evaluation. The initial evaluation usually includes detailed history of medications, blood investigations including liver function tests, triglyceride levels, calcium levels and imaging studies which include an ultrasound of the abdomen and a contrast enhanced computed tomography of the abdomen. In these patients magnetic resonance cholangiopancreatography (MRCP), endoscopic ultrasound (EUS), endoscopic retrograde cholangiopancreatography (ERCP) and sphincter of Oddi manometry (SOM) are usually performed to find out the underlying cause of acute recurrent pancreatitis. However, in 21% to 62% of the cases of idiopathic recurrent pancreatitis no cause can be found even after an ERCP and such patients pose an important diagnostic and therapeutic dilemma[1]. In the current study the authors prospectively evaluated the role of intraductal ultrasound (IDUS) for detecting possible causes of idiopathic recurrent pancreatitis (IRP) in patients with negative findings on ERCP.

The authors enrolled 31 patients (11 males; age range: 30 to 79 years) suspected with IRP. These patients had a mean of 2.6 (range 2-5) attacks of pancreatitis. They defined suspected IRP if the patients had all of the following: (1) no evidence of a cause of the pancreatitis on noninvasive imaging modalities such as abdominal US, pancreatic CT, and MRCP at the first attack of acute pancreatitis; (2) no evidence of a cause of the pancreatitis on ERCP and SOM of the bile duct at the second episode; (3) no history of consumption of alcohol or any toxic substance; (4) no metabolic condition that leads to pancreatitis; and (5) no history of hereditary pancreatitis. They excluded patients with at least one of the following: (1) abnormal results on 2 of 3 liver function tests (elevations greater than twice normal for total bilirubin, alanine aminotransferase, or alkaline phosphatase) and (2) unsuccessful cannulation at ERCP. Importantly endoscopic ultrasound was not done in any of these patients. Six patients (19.4%) had a history of a cholecystectomy, and only 2 (8%) of the remaining 25 patients had 1 or more gallstones.

The patients underwent ERCP after resolution of pancreatitis and both the pancreatic duct and the bile duct were cannulated and both the cholangiogram and pancreatogram obtained. IDUS was performed immediately after ERCP and all IDUS was performed by the same endoscopist. Two mm diameter US probe with a frequency of 20 MHz (UM-G20-29R; Olympus, Tokyo, Japan) was inserted in the bile duct over the guide wire without sphincterotomy. If a hyperechoic particle with an acoustic shadow was shown on IDUS, it was considered as a bile duct stone. If there was hyperechoic material without an acoustic shadow, it was regarded as biliary sludge. In cases of stones, endoscopic extraction was done after sphincterotomy or balloon dilatation of the papilla. In case of negative IDUS, the bile duct was swept with a balloon catheter or small basket. The gold standard for a stone was an endoscopically demonstrated stone fragment or stone, sludge was amorphous or sandy granule-like material, and a polyp was confirmed with histopathological evaluation.

In these 31 patients, the mean diameter of the CBD was 8.2 mm (range 515 mm), and 7 (22.5%) patients showed a dilated CBD with a diameter of 10 mm or more on ERCP. IDUS detected a possible cause of IRP in 13 patients (41.9%). The most common finding was a small bile duct stone less than 3 mm in diameter in 5 (16.1%) patients. Other findings noted were biliary sludge in 3 patients (9.7%), chronic pancreatitis in 3 patients (9.7%) and a polypoid lesion on the distal end of the pancreatic duct in 2 patients (6.5%). The mean diameter of the CBD stones diagnosed by IDUS was 2.2 mm and the stones were confirmed endoscopically in 4/5 patients. All 3 patients who had sludge were confirmed by endoscopic visualization after sphincterotomy. During the
median follow-up period of 36.4 months, recurrent pancreatitis did not develop in 7 of these 8 patients (87.5%) with bile duct stones or sludge after extracting the stone or sludge, and recurrent pancreatitis developed in only 1 patient (12.5%). The authors also found that the detection rate for CBD stone and sludge was significantly higher in patients with a dilated CBD on ERCP in comparison to patients with non-dilated CBD (71.4 vs 12.5%; \( p < .05 \)). The authors concluded that ERCP combined with IDUS may be useful for identifying a possible cause of IRP and to reduce the risk of recurrent pancreatitis.

**Commentary**

The authors of the current study have attempted to address an important clinical dilemma of idiopathic acute recurrent pancreatitis and have used IDUS for evaluation of these patients. Although this study has raised many questions, it has reemphasized the need for excluding occult biliary diseases as a possible cause of acute recurrent pancreatitis. An important limitation of this study is that none of these 31 patients underwent endoscopic ultrasound (EUS). It is possible that many of these findings detected by IDUS could have been detected by EUS as EUS has been shown to be very useful investigative tool in patients with acute pancreatitis[2]. And importantly EUS is safer than IDUS which has a potential risk of acute pancreatitis. Since majority of the patients in the current study also had biliary stone or sludge, a question arises about the role of empiric cholecystectomy or biliary sphincterotomy instead of expensive diagnostic investigations. The definitive answers to these questions can come only from prospective well designed multi-centre studies. But till than how should we investigate and manage patients with idiopathic acute recurrent pancreatitis (IARP)? I feel in the modern world of medicine role of any empirical therapy should be limited and we should do our best to find out the cause of any disease. Same should also hold true for IARP. In our daily practice in investigating these patients we follow a step wise approach where a non invasive investigation is done first and investigations with potential risks are done later. Therefore for evaluating IARP, first a MRCP (with secretin if available) would be a preferred investigating modality. If its negative, then EUS can be done and I feel it should be considered as the first line investigation for IARP patients with negative MRCP as it is highly accurate for stones/sludge and pancreatic abnormalities. If EUS is negative then one can consider doing an ERCP with SOM as well as IDUS. Many centers would also prefer doing genetic testing before an ERCP.

**Endoscopic Treatment of Gastrointestinal Fistulas Using an Over-the-scope Clip (OTSC) Device: Case Series from a Tertiary Referral Center**

R. Manta, M. Manno, H. Bertani, C. Barbera, F. Pigò, V. Mirante, E. Longinotti, G. Bassotti, R. Conigliaro

Endoscopy 2011;43:545-48

Gastrointestinal perforations and fistulas have been one of the most difficult problems to manage, with surgery being the treatment of choice. However, surgery has been associated with considerable morbidity. Therefore, there have been increased efforts to develop endoscopic methods for closure of perforations and fistulae. Various endoscopic techniques like stenting, glue injection, fibrin injection and clipping have been tried with varying results. Several varieties of clip device are available, including rotatable devices, single-shot systems, and clips that can be reopened[3]. However, the results with clips in fistulae and perforations are not so encouraging as these clips have some limitations like low closure force that is suboptimal for compressing scarred and hardened tissues, and therefore there is only partial success in closing large and circular full-thickness wall perforations. To overcome these limitations of the conventional clips, a new endoscopic over the scope clip (OTSC) system (Ovesco AG, Tübingen, Germany), has recently been introduced. This device is biocompatible for long-term implantation, can capture a large amount of tissue, deliver a compression force of approximately 89 N when released, and compress the lesions until the wall defects have healed[4]. Some preliminary human studies with this device have yielded encouraging results[5,6]. OTSC system is used with the standard endoscope and a twin or anchor type grasper is used. The Ovesco twin grasper has two jaws that move separately to approximate the edges of the gastrointestinal tract wall before applying suction. The anchor grasper has three retractable hooks, which facilitate approximation of the margins of the tissue before succioning. Two different types of OTSC are commercially available: theatraumatic version with blunt teeth for clipping fresh borders or vessels in gastrointestinal bleeding, and the traumatic version with sharp teeth for more fibrotic tissues. The clip is mounted onto a silicone cap (similar to a band ligation device), placed onto the tip of an endoscope, and applied by stretching a wire by means of a hand-wheel installed on the entrance of the working channel. When the clip is released from the applicator, it closes because of the “shape-memory” effect and the
high elasticity of the nitinol alloy. In the current study, the authors evaluated the advantages and clinical impact of the OTSC system in the management of nonmalignant gastrointestinal tract wall leaks.

The authors evaluated this device in 12 patients (6 males) with post-surgical or traumatic fistulas of the gastrointestinal tract. The defect diameters of these fistulae were 625 mm. The endoscope with a working channel diameter of 3.8 mm and with the mounted and loaded clipping devices, was positioned in front of the mucosal leak, the fistulous tract was grasped by the OTSC grasper, invaginated into the applicator cap, and closed by deploying the OTSCs. The authors used traumatic version of the clip for better adhesion. Endoscopy was repeated according to the clinical requirement. Water-soluble contrast radiographs were taken to assess the sealing of the leaks immediately after clipping with the OTSC, and repeated 1 month later in selected cases.

There were no complications and the fistulae healed in 11/12 patients within a period of 1-3 months. In 9 of the 11 patients, the leak was sealed within 4 days by a single application. One patient who had complete sealing of the fistula however died because of unrelated sepsis. In one patient the clip got detached but it was repositioned and the fistula healed. Three patients required additional treatment in the form of stents in 2 patients and standard clips in one patient that were applied to additional smaller defect. In authors experience this device will not be successful if the defect is more than 2.5 cm, when the leak edges are fibrotic, and in patients who had undergone multiple surgical approaches. The authors concluded that the endoscopic closure of perforations and post-surgical fistulae with the OTSC system is a simple and minimally invasive technique.

Commentary

We all endoscopists must have at some stage got frustrated in treating gastrointestinal fistulas when everything including glue, clips and stents would have failed and made us wonder what should we do next. This OTSC system appears to be safe and effective and would be probably the best endoscopic treatment modality for fistulae and perforations short of endoscopic suturing. Also since its use is similar to the variceal band ligation system, it appears to be easier to use. The results of the current study are encouraging but we still need to define the cases which would benefit the most from this device. Also how the graspers would perform in the presence of active inflammation and friability of tissues needs to be ascertained. Another recent study from Germany has also shown that OTSC are effective in treating gastrointestinal perforations and fistulae as well as securing hemostasis in large complex bleeding lesions[7]. However, this study also concluded that in large bleeding lesions these clips could achieve transient hemostasis but durable hemostasis was less frequent. The results of all these studies are encouraging and OTSC is a new tool in the armamentarium of the therapeutic endoscopists. This tool seems to be highly effective for intermediate sized perforations and fistulae (less than 2.5 to 3.0 cm) and standard hemoclips seem to be cheap and effective option for small perforations and large (>3.0 cm) perforation can be either managed surgically or with endoscopic suturing devices.

References


Reprints requests and correspondence:
Dr. Surinder Singh Rana, dm
Department of Gastroenterology
PGIMER, Chandigarh – 160 012, India
Tel: +91-172-2749123, Fax: +91-172-2744401
E-mail: drsurinderrana@yahoo.co.in
Three interesting papers dealing with different aspects of endoscopic treatment of achalasia cardia have been recently published. These studies will be briefly reviewed below.

**Pneumatic Dilation Versus Laparoscopic Heller’s Myotomy for Idiopathic Achalasia**


Laparoscopic Heller’s myotomy (LHM) is considered the current standard of care for achalasia, and is believed to be superior to pneumatic dilation (PD) for this indication. High short-term success rates approaching 100% have been reported with LHM from 11 single-center series[1]. A recent meta analysis which included 17 studies with 761 patients, concluded that LHM had increased remission rates compared with PD (RR 1.48, 95% CI 1.48-1.87), and reduced clinical relapse rates (RR 0.14, 95% CI 0.04-0.58), with no difference in complication rates (RR 1.48, 95% CI 0.37-5.99). This meta-analysis recommended that LHM should be the preferred method for treating patients with achalasia [2]. Another meta-analysis including a total of 105 articles reporting on 7855 patients, concluded that laparoscopic myotomy, provided better symptom relief (90%) than all available endoscopic approaches, with a low complication rate (6.3%)[3]. However, variable endoscopic dilatation protocols and definitions of success were used in most of these studies.

This randomized study was carried out from February 2003 through February 2008, at 14 hospitals located in 5 European countries. Patients between 18 and 75 years of age, with newly diagnosed achalasia, and with an Eckardt symptom score of > 3, were eligible for inclusion. Eckardt score is a composite score that evaluates weight loss, symptom score of > 3, were eligible for inclusion. Eckardt score at 4 weeks after the later session remained > 3, the patient was considered to have had treatment failure.

Patients with recurrence of symptoms during the follow-up period underwent repeat dilation with a 35-mm balloon, and if necessary (i.e., if the Eckardt score remained > 3) with a 40-mm balloon. A third and final series of dilations was allowed only if symptoms recurred more than 2 years after this second series. If symptoms recurred within 2 years after the second series of dilations, the patient was considered to have had treatment failure.

For patients assigned to the LHM group, a myotomy was performed extending at least 6 cm above the gastroesophageal junction, and at least 1 to 1.5 cm over the stomach. Thereafter, anterior 180-degree fundoplication was performed.

The primary outcome was therapeutic success, as defined by a drop in the Eckardt score to =3 at the yearly follow-up assessment. The secondary outcomes included the need for re-treatment, pressure at the lower esophageal sphincter, esophageal emptying on a timed barium esophagogram, quality of life, and the rate of complications.

A total of 201 patients were randomly assigned to PD (95 patients) or LHM (106). The baseline characteristics of the groups were well balanced. The mean follow-up time was 43 months (95% CI: 40 to 47). In an intention-to-treat analysis, there was no significant difference between the two groups in the primary outcome. The rate of therapeutic success with PD was 90% after 1 year of follow-up and 86% after 2 years, as compared with a success rate with LHM of 93% after 1 year and 90% after 2 years (p=0.46). After 2 years of follow-up, there was no significant between-group difference in the pressure at the lower esophageal sphincter (LHM, 10 mmHg [95% CI: 8.7 to 12]; pneumatic dilation, 12 mmHg [95% CI: 9.7 to 14]; p=0.27); esophageal emptying, as assessed by the height of barium-contrast column (LHM, 1.9 cm [95% CI: 0 to 6.8]; pneumatic dilation, 3.7 cm [95% CI: 0 to 8.8]; p=0.21); or quality of life scores. Similar results were obtained in the per-protocol analysis. Perforation of the esophagus occurred in 4% of the patients during pneumatic dilation, whereas mucosal tears occurred in 12% during LHM. Of the four patients with perforation after PD, 2 could be managed conservatively. Abnormal exposure to esophageal acid was observed in 15% and 23% of the patients in the pneumatic-dilation and LHM groups, respectively (p=0.28).

The authors concluded that ‘after 2 years of follow-up, LHM, as compared with PD, was not associated with superior rates of therapeutic success.’
Discussion

This was a well-planned and executed study. Standardized diagnostic and response criterion were defined. The diagnosis of achalasia was made on the basis of absent peristalsis, and impaired relaxation of the lower esophageal sphincter (nadir pressure of $\geq 10$ mmHg during swallow-induced relaxation) on esophageal manometry. A validated and multidimensional score - the Eckardt score, was used as the primary end point. This score is the sum of the symptom scores for dysphagia, regurgitation, chest pain (with a score of 0 indicating the absence of symptoms, 1 indicating occasional symptoms, 2 indicating daily symptoms, and 3 indicating symptoms at each meal), and weight loss (with 0 indicating no weight loss, 1 indicating a loss of $< 5$ kg, 2 indicating a loss of 5 to 10 kg, and 3 indicating a loss of $> 10$ kg). The Eckardt scale ranges from 0 to 12, with higher scores indicating more pronounced symptoms.

In addition to symptom scores, quality of life scores were assessed one month after treatment and then yearly, and esophageal manometry and timed barium esophagography were also performed. Two quality-of-life questionnaires - the Medical Outcomes Study 36-Item Short-Form Health Survey [SF-36], and the European Organization for Research and Treatment of Cancer disease-specific questionnaire module for patients with esophageal cancer [QLQ-OES24], were used. Most importantly, the treatment sessions were standardized, as described above. Treatment was considered to have failed only after adequate endoscopic dilatation sessions had been carried out.

Of the 95 patients randomized to the PD group, 4 patients did not have a response to treatment after the initial dilatation series, and 23 patients had a recurrence of symptoms. Re-dilatation was performed in 17 of these 23 patients (6 patients declined the procedure), but was not successful in 5 patients, who were then referred for surgery. Of the 106 patients treated with LHM, 15 patients were considered to have had treatment failure, and were subsequently treated with pneumatic dilation.

The authors also identified some factors which predicted a higher risk of failure after PD: pre-existing daily chest pain, a height of the barium-contrast column of more than 10 cm (as compared with $\approx 5$ cm) as measured 5 minutes after ingestion of barium after treatment, and esophageal diameter of $< 4$ cm before treatment. The reason why a smaller esophageal diameter $< 4$ cm before treatment was associated with treatment failure is unclear, but it may be indicative of vigorous achalasia.

There are only two previous randomized studies comparing PD with surgical myotomy. The results of the present study are similar to a smaller previous randomized study (including 51 patients) that showed no significant between-group difference in the success rates[5]. However, only single dilatation sessions were carried out, and more treatment failures were encountered in the PD group during the 12 months of follow up. In contrast, in an older randomized study, open Heller’s myotomy was superior to pneumatic dilation. However, the dilatation protocol used in that study was probably suboptimal[6].

It is important to remember that success rates of PD reported in the literature vary widely, depending on how it is defined. If efficacy were defined as the lack of need for any subsequent intervention, the success rate with PD would be much lower than that with surgery. It should be realized that many patients would require repeated dilatation sessions to treat recurrent symptoms. The present study allowed patients who were randomly assigned to PD, to undergo additional PD if symptoms recurred.

The authors concluded that LHM was not associated with superior rates of therapeutic success compared with PD. They suggest that graded dilation starting with a 30-mm balloon is a reasonable protocol for PD treatment of achalasia.

---

Epidemiology and Practice Patterns of Achalasia in a Large Multi-centre Database

Enestvedt BK, Williams JL, Sonnenberg A.
Aliment PharmacolTher 2011; 33: 1209-14.

In this report the authors describe the epidemiology of achalasia, and practice patterns in its endoscopic management, utilizing patient records from a large national database of endoscopic procedures in the United States (US). The Clinical Outcomes Research Initiative (CORI) database maintains a record of endoscopic procedures in diverse clinical practices. For this study, data from 89 endoscopy practices distributed throughout the US, during the periods from 2000 - 2008 were used. The types of endoscopic therapy were categorized by their use of injection of botulinum toxin (Botox), Maloney dilator, Savary dilator, Rigiflex balloon, other balloon types and other treatments (Eder-Puestow or unnamed dilatation types).

Among 521,497 upper endoscopies during the study period, the authors identified 896 patients who were treated for achalasia. The mean age of achalasia subjects was 62 + 19 years. There was an age-related rise in the occurrence of achalasia, with the majority of cases occurring in patients older than 50 years. Compared with all other endoscopic diagnoses, achalasia was more common in men than in women (OR = 1.39, CI: 1.22-1.59), but similar among nonwhites and whites (OR = 0.87, CI: 0.74-1.03). Relatively, more achalasia patients were treated at university hospitals, than at community practices (OR = 1.52, CI: 1.30-1.78).

---

Research and Treatment of Cancer disease-specific questionnaire module for patients with esophageal cancer [QLQ-OES24], were used. Most importantly, the treatment sessions were standardized, as described above. Treatment was considered to have failed only after adequate endoscopic dilatation sessions had been carried out.

Of the 95 patients randomized to the PD group, 4 patients did not have a response to treatment after the initial dilatation series, and 23 patients had a recurrence of symptoms. Re-dilatation was performed in 17 of these 23 patients (6 patients declined the procedure), but was not successful in 5 patients, who were then referred for surgery. Of the 106 patients treated with LHM, 15 patients were considered to have had treatment failure, and were subsequently treated with pneumatic dilation.

The authors also identified some factors which predicted a higher risk of failure after PD: pre-existing daily chest pain, a height of the barium-contrast column of more than 10 cm (as compared with $=5$ cm) as measured 5 minutes after ingestion of barium after treatment, and esophageal diameter of $< 4$ cm before treatment. The reason why a smaller esophageal diameter $< 4$ cm before treatment was associated with treatment failure is unclear, but it may be indicative of vigorous achalasia.

There are only two previous randomized studies comparing PD with surgical myotomy. The results of the present study are similar to a smaller previous randomized study (including 51 patients) that showed no significant between-group difference in the success rates[5]. However, only single dilatation sessions were carried out, and more treatment failures were encountered in the PD group during the 12 months of follow up. In contrast, in an older randomized study, open Heller’s myotomy was superior to pneumatic dilation. However, the dilatation protocol used in that study was probably suboptimal[6].

It is important to remember that success rates of PD reported in the literature vary widely, depending on how it is defined. If efficacy were defined as the lack of need for any subsequent intervention, the success rate with PD would be much lower than that with surgery. It should be realized that many patients would require repeated dilatation sessions to treat recurrent symptoms. The present study allowed patients who were randomly assigned to PD, to undergo additional PD if symptoms recurred.

The authors concluded that LHM was not associated with superior rates of therapeutic success compared with PD. They suggest that graded dilation starting with a 30-mm balloon is a reasonable protocol for PD treatment of achalasia.

---

Epidemiology and Practice Patterns of Achalasia in a Large Multi-centre Database

Enestvedt BK, Williams JL, Sonnenberg A.
Aliment PharmacolTher 2011; 33: 1209-14.

In this report the authors describe the epidemiology of achalasia, and practice patterns in its endoscopic management, utilizing patient records from a large national database of endoscopic procedures in the United States (US). The Clinical Outcomes Research Initiative (CORI) database maintains a record of endoscopic procedures in diverse clinical practices. For this study, data from 89 endoscopy practices distributed throughout the US, during the periods from 2000 - 2008 were used. The types of endoscopic therapy were categorized by their use of injection of botulinum toxin (Botox), Maloney dilator, Savary dilator, Rigiflex balloon, other balloon types and other treatments (Eder-Puestow or unnamed dilatation types).

Among 521,497 upper endoscopies during the study period, the authors identified 896 patients who were treated for achalasia. The mean age of achalasia subjects was 62 + 19 years. There was an age-related rise in the occurrence of achalasia, with the majority of cases occurring in patients older than 50 years. Compared with all other endoscopic diagnoses, achalasia was more common in men than in women (OR = 1.39, CI: 1.22-1.59), but similar among nonwhites and whites (OR = 0.87, CI: 0.74-1.03). Relatively, more achalasia patients were treated at university hospitals, than at community practices (OR = 1.52, CI: 1.30-1.78).
Interestingly, Botox injection was most frequently used as the first choice of endoscopic therapy in 41%, followed by balloon dilatation in 21%, Savary dilatation in 20%, Maloney dilatation in 10%, Rigiflex in 4% and other modalities in 4% of patients. One quarter of achalasia patients treated endoscopically underwent a repeat therapy within 14 months.

The authors noted that Botox has become the primary choice of initial endoscopic therapy in achalasia in the US. Despite their deviation from guidelines and recommendations, these endoscopic patterns reflect the current clinical practice in the US.

Discussion

This report is of interest for two reasons: First, it reflects how the endoscopy practice is altered by the threat of lawsuits in a developed country. Second, it highlights the importance of maintaining a national registry of all endoscopic procedures to analyze the current practice patterns.

CORI is a national multi-center consortium of gastroenterology practices distributed throughout the US. CORI includes community, Department of Veterans Affairs (VA), and academic practices. Physicians participating in the CORI consortium produce gastrointestinal endoscopy reports using a specialty electronic health record. Data from the reports are sent electronically to a central data repository, where they are pooled with data from other consortium participants in the National Endoscopic Database (NED). The CORI project began in 1995 under the auspices of the American Society for Gastrointestinal Endoscopy (ASGE). The CORI project developed a report-generator software application to obtain endoscopic data in the normal flow of clinical practice from clinicians. Data from each clinician is transmitted electronically to a central data repository, where it is merged with data from other practice sites[7]. Till date, analysis of the CORI database has resulted in 47 manuscripts in peer-reviewed journals. The current report could also be made possible from the pooled CORI database, given the relatively small groups of achalasia patients from individual tertiary care centers.

It was found that in all practices alike, Botox injection has emerged as the most commonly used endoscopic therapy for achalasia, especially in the elderly patients. This trend may reflect the complexity and risks associated with the endoscopic management of achalasia. As Botox injection has been demonstrated to be safe, effective, inexpensive and easy to perform, it has become an appealing strategy for the management of achalasia. It is possible that physicians in the US were more likely to utilize Botox injection in patients with advanced age or severe co-morbidities, because of their concerns about the greater risks associated with PD or surgical myotomy.

It is known that approximately two-thirds of patients report improvement in achalasia symptoms after injection of botulinum toxin, but most have a relapse within 6 months. In addition, the efficacy of repeated injections decreases over time[8]. In a recent meta-analysis, it was found that there was a better remission rate with PD than with botulinum toxin injection as the initial intervention [relative risk (RR) 2.20, 95% confidence interval (CI) 1.51-3.20], and PD had lower relapse rate than did botulinum toxin injection (RR 0.12, 95% CI 0.04-0.32) [2]. Another meta-analysis reported that symptom relief after PD was better than after botulinum toxin injection (68.2% vs. 40.6%; OR 3.4; 95% CI, 1.2-9.8; P = 0.02), with lesser need for additional therapy (25% vs 46.6%; OR, 2.6; 95% CI, 1.05-6.5; P = 0.04)[3].

Unexpectedly, a substantial fraction of patients with achalasia were treated with Savary and Maloney dilators. These methods for dilatation are typically ineffective in fracturing the muscularis propria of the lower esophageal sphincter, which is the aim of dilatation in patients with achalasia.

The drawback of the current study was that data on therapy were only available for 60% of all achalasia patients. It is also not known that what proportions of patients were referred for myotomy after the above-mentioned treatment efforts.

Peroral Endoscopic Myotomy (POEM) for Esophageal Achalasia


Endoscopy 2010; 42: 265-71

Endoscopic myotomy for treatment of achalasia was first reported more than 20 years back by Ortega et al from Venezuela, in a case series of 17 patients[9]. These authors used a modified needle knife to endoscopically incise the esophageal muscle layer directly through the mucosal layer. This approach has not been subsequently replicated in other series.

A novel method involving submucosal endoscopy was used to perform endoscopic myotomy in a porcine model by Pasricha et al[10]. Stavropoulos et al from New York city first reported a single human case of achalasia, treated by this approach[11].

In this paper, Inoue et al, from the Showa University Northern Yokohama Hospital, Japan, describe their results with ‘peroral endoscopic myotomy’ (POEM) procedure in a human series from the first time. POEM was performed in 17 consecutive patients with achalasia (10 men, 7 women; mean
age: 41.4 years). Three of the patients had previously undergone uncomplicated balloon dilatation procedures. The duration of symptoms ranged from 6 months to 30 years, with an average duration of 8.4 years. All patients underwent a barium swallow study before the procedure, and computed tomographic (CT) scans and esophageal manometry before and after the POEMs procedure.

Briefly, a long submucosal tunnel was created (mean length: 12.4 cm), followed by endoscopic myotomy of circular muscle bundles for a mean length of 8.1 cm (6.1 cm in distal esophagus, and 2.0 cm in cardia). Smooth passage of an endoscope through the gastroesophageal junction (GEJ) was confirmed at the end of the procedure. Operating time ranged from 100 to 180 minutes (average 126 minutes). The procedure is described in detail in the discussion section below.

The scoring of dysphagia, before and after treatment was done on an arbitrary scale of 0 to 10. Scoring was done before POEM, and after POEM on the day of discharge from hospital, and every 3 months subsequently. The authors found that there was a significant reduction in the dysphagia symptom score (from mean of 10 to 1; p = 0.0003), and the resting lower esophageal sphincter (LES) pressure (from mean 52.4 mmHg to 19.9 mmHg; p = 0.0001), in all cases after the POEMs procedure.

No serious complications related to POEM were encountered. During follow-up (mean 5 months; range: 1-16 months), no patient developed recurrent symptoms of dysphagia. Additional treatment or medication was necessary in only one patient who developed reflux esophagitis (Los Angeles classification B), and required a regular intake of proton pump inhibitors.

The authors concluded that the outcome of POEM for achalasia was excellent in the short term. Further studies on long-term efficacy and on comparison of POEM with other interventional therapies are awaited.

Discussion

Both non-sigmoid (12 patients) and sigmoid types (5 patients) of achalasia were included in this series. The sigmoid type of achalasia was classified as either type 1 (S1), or type 2 (S2). In S1 type the esophagus was significantly dilated and tortuous, but only a single lumen was seen on any computed tomography (CT) slice. The S2 type was an extremely advanced sigmoid form, where the esophageal lumen was tortuous and turned upwards. This was recognized on some CT slices as a double lumen. Presence of S2 sigmoid achalasia was considered to be an exclusion criterion, because a simple myotomy could not be expected to relieve symptoms.

A routine forward-viewing endoscope of outer diameter 9.8 mm (GIF-H260; Olympus, Tokyo) was used with a transparent distal cap attachment (MH-588, Olympus). All procedures were done under general anesthesia, with positive pressure ventilation after intra-tracheal intubation. The aim was to ventilate the patient with higher pressures than those generated by the endoscopic insufflation. Additionally, CO₂ gas (UCR CO₂ insufflator; Olympus) was insufflated during the procedure instead of air, to reduce the risk of mediastinal emphysema, and air embolism.

Saline with 0.3% indigo carmine was injected to expand the submucosal space for dissection. The first submucosal injection was made at the level of the mid esophagus, approximately 13 cm proximal to the GEJ. A 2 cm longitudinal mucosal incision was made to create an entry to the submucosal space. An anterior myotomy in the 2 o'clock segment in the supine position was preferred, as this led to the lesser gastric curvature. Dissection along the lesser curve potentially avoids damage to the angle of His, which may be a natural barrier to postoperative reflux of gastric content.

Endoscopic submucosal dissection (ESD), with spray coagulation mode, was used to create a submucosal tunnel, passing the GEJ, and extending to about 3 cm into the proximal stomach. The width of the submucosal tunnel extended to about half of the circumference of the tubular esophagus. Larger vessels in the submucosa were coagulated using a hemostatic forceps (Coagrasper, FD-411QR; Olympus) using the soft coagulation mode.

Dissection of the circular muscle bundle was begun 3 cm distal to the mucosal entry site, approximately 7 cm above the GEJ. To dissect the circular muscle layer, a triangle-tip-knife (KD-640L; Olympus) was used, which dissected the inner muscle layer step by step. Muscle layer cutting was continued from proximal to distal, till approximately 2 cm distal to the GEJ. After dissection of the circular muscle bundles, outer longitudinal muscle bundles were endoscopically identified at the limit of the dissected area. Complete division of the circular muscle bundle was confirmed by the endoscopic appearance. The authors found that a full-layer myotomy was not necessary in order to achieve a significant reduction of the LES pressure, which decreased to the normal range without any incision of the outer longitudinal muscle layer.

After completion of the myotomy, smooth passage of an endoscope through the GEJ with minimal resistance was confirmed by conventional endoluminal endoscopy. The mucosal entry site was finally closed with about five hemostatic clips (EZ-CLIP, FX-110QR; Olympus). At the end of the procedure, the endoscope was again inserted into the natural lumen down to the stomach, to confirm smooth passage through the GEJ[12].

Pneumoperitoneum occurred in one patient, causing temporary elevation of intraperitoneal pressure; puncture of the abdominal wall using an 18-gauge plastic needle allowed quick recovery from the excessive elevation of abdominal pressure.
The advantages of the procedure are that an unexpected perforation of the esophagus, as may occur after balloon dilatation is avoided. The submucosal tunnel was created under direct visual control. Hence submucosal hematoma and/or abscess were not encountered. In this series, the mean length of myotomy was 8.1 cm, which compares favorably with the 7-cm long myotomy recommended in the surgical literature[13]. The authors felt that they could control the length of myotomy to be as long as desired in the POEMS procedure. They speculate that when the patient complains of chest pain because of esophageal spasm, a longer myotomy of more than 7 cm along the esophagus may be made. Hence with further refinements, this procedure can be tailored to the individual patient. Lastly, if the POEM procedure is not effective in any patient, laparoscopic operation still remains possible.

This paper provides proof of concept, that safe and effective endoscopic surgery of achalasia is possible. However, appropriate patient selection, and highly skillful operators remain critical for carrying out this procedure.

References

Source of support: Nil; Conflict of interest: none declared