Review Article

Achalasia: an easy to swallow summary of the evolution in guidelines

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Abstract: Within this special journal edition, the pathophysiology of achalasia, high-resolution manometry, available treatment modalities, and how to tailor treatment to an individual patient have been discussed in detail. This article does not seek to summarize these areas. Instead, historic and contemporary achalasia guidelines are reviewed with particular reference to how these have evolved over time to reflect the introduction and impact of key technological advances, namely laparoscopic surgery, high-resolution manometry and per-oral endoscopic myotomy (POEM).

Keywords: Achalasia; Heller's myotomy; guidelines

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Methodology

A PubMed search using the keywords 'achalasia' 'dysphagia' and 'guidelines' revealed seventy-eight articles meeting the criteria of interest. Twelve articles were selected after further assessment as guidelines or expert clinical updates relevant to the field of discussion. Of note, not all were exclusive to the treatment of achalasia alone. One of these articles referred to only a local hospital's experience and guidelines and was therefore excluded from further review (1). *Table 1* summarizes the included guidelines ordered by publication date.

Early guidelines

Achalasia guidelines have been in place for over 20 years with Spechler *et al.* (2) on behalf of the American Gastroenterological Association (AGA) detailing their proposed management of patients with dysphagia in a published position statement in 1999. Written prior to the widespread utilization of laparoscopic surgery and management options such as per-oral endoscopic myotomy (POEM), the AGA guidelines advocated that investigations should involve barium swallow, manometry, and endoscopy for all patients with a suspicious clinical history to exclude pseudoachalasia. Thereafter, management strategies were divided into two streams depending on patient fitness; a good surgical candidate or poor surgical candidate. Patients fit for surgery were offered surgery or pneumatic dilatation. At the time of publication, surgery was reported to be 'somewhat' superior however disadvantages stated included high cost, protracted recovery period (open myotomy), and an increased incidence of post-surgical gastro-esophageal reflux disease. It is unclear from the document if a fundoplication was widely utilized or advocated post myotomy. Patients considered medically unfit who had failed medical management with nitrate or calcium channel blockers were recommended to have bougie dilatation. It is interesting to note that this was considered less invasive and/or better tolerated in this medically comorbid population than an endoscopic pneumatic dilatation. Current practice, evidence, and recommendations have certainly moved away

Table 1 Chronology of achalasia guideline publications.

Responsible organization	Authors	Reference	Date
American Gastroenterological Association (AGA)	Spechler (2)	Gastroenterology 1999;117:229-32	1999
Society for Surgery of the Alimentary Tract (SSAT)	SSAT Committee (3)	J Gastrointest Surg 2007;11:1210-2	2007
Society of American Gastrointestinal and Endoscopic Surgeons (SAGES)	Stefanidis *et al.* (4)	Surg Endosc 2012;26:296-311	2012
American College of Gastroenterology (ACG)	Vaezi *et al.* (5)	Am J Gastroenterol 2013;108:1238-49; quiz 1250	2013
World Gastroenterology Organisation (WGO)	Malagelada *et al.* (6)	J Clin Gastroenterol 2015;49:370-8	2015
American Gastroenterological Association (AGA)	Kahrilas *et al.* (7)	Gastroenterology 2017;153:1205-11	2017
American Gastroenterological Association (AGA)	Hirano *et al.* (8)	Clin Gastroenterol Hepatol 2017;15:325-34	2017
British Society of Gastroenterology (BSG)	Sami *et al.* (9)	Gut 2018;67:1000-23	2018
Japan Gastroenterological Endoscopy Society (JGES)	Inoue *et al.* (10)	Digestive Endoscopy 2018;30:563-79	2018
International Society for Diseases of the Esophagus (ISDE)	Zaninotto *et al.* (11)	Dis Esophagus 2018	2018

from this as a primary management option.

Following the publication of these early guidelines, there was a seeming dearth of evidence-based guidance until the Society for Surgery of the Alimentary Tract (SSAT) published their patient care guidelines in 2007 (3). The authors acknowledged that historically until this point there had been a trend towards pneumatic dilatation as the primary treatment modality. Surgery was reserved for patients with persistent dysphagia resistant to dilatation or patients with post dilatation complications such as perforation. The advent of laparoscopic Heller's myotomy and partial fundoplication completely changed the treatment algorithm, becoming the preferred treatment modality for most treating physicians. At the time, only one prospective randomized trial existed comparing balloon dilatation with surgery in which the authors reported an improved outcome with myotomy versus balloon dilatation (95% *vs.* 65%) (12). The addition of a partial fundoplication (Dor or Toupet) to the myotomy was similarly validated prior to the guideline publication with a randomized controlled trial (13) which demonstrated clear improvement in post-operative reflux symptoms. The SSAT authors therefore recommended a laparoscopic Heller's myotomy with partial fundoplication as standard.

Guidelines in the last decade

Following these initial early publications, in response to an increased body of data and evidence the last decade has seen the publication of a further six sets of national or international guidelines.

The Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) conducted a systematic literature review in October 2010 and identified 214 relevant articles in line with the search criteria. Their guidelines, published in 2012 (4) are graded based on the quality of evidence in four tiers (very low, low, moderate, high) and provide a 2-tier system for the strength of recommendations (weak or strong). The gold standard triad of diagnostic tests remains esophageal manometry, endoscopy, and a barium esophagram with a high level of evidence base. It remains well established that there is no treatment option available to change the underlying pathology of the disease and, as such, treatment options remain palliative in nature and focus on symptom management. Pharmacotherapy options such as smooth muscle relaxants (calcium channel blockers and long acting nitrates) might play a limited role in the early treatment of achalasia by reducing the lower esophageal sphincter pressure and relieving dysphagia. But, orally administered drugs have variable and unpredictable absorption and therefore SAGES recommends the use of sublingual formulations if this strategy is being utilized.

Botulinum toxin has been shown to be effective in up to 85% of patients with achalasia by inhibiting the release of acetylcholine at the pre-synaptic terminal of motor neurons. SAGES' analysis of the literature however reports a clear diminished effect with time and an almost universal relapse after 2 years. They therefore recommend limiting its use

to the older comorbid population who might not be fit for alternative treatment strategies.

Pneumatic dilatation is recommended ahead of rigid dilatation due to the bimodal effect of both stretching and splitting muscle fibres. The authors acknowledge that data analysing dilatation can be difficult to compare and interpret due to wide variability in outcome measures. Dysphagia-free post dilatation rates are reported to range from 48–78% at 5 years with only 13% of patients having continued remission after a single treatment. Variability in dilators used and the use of fluoroscopic guidance had no significant effect on outcomes. However, these guidelines reported some concern with the risk of complications associated with dilatation and as such recommend strongly, and based on a high level of evidence, that its use should be confined to selected patients who refuse surgery or are poor surgical candidates. However, it remained the most effective non-operative option at the time of these guidelines being released, with POEM only at the very early stages of its rapid evolution. Alternative non-operative treatment options including combination strategies and the use of stents were not recommended.

Perhaps not surprisingly, the SAGES guidelines advocate very clearly for surgery to be the primary treatment modality. The authors recommend that this should be performed by appropriately trained surgeons, include a partial fundoplication (anterior or posterior of equal efficacy compared with total wrap) and be performed laparoscopically via a transabdominal approach. Novel techniques such as POEM were in their infancy at the time of publication and a further body of evidence was advised before making definitive recommendations on their use. Interestingly, only weak evidence existed to suggest that previous endoscopic therapies prior to myotomy are associated with worse outcomes and morbidity. Other hypothetical factors that may predict outcomes from surgery such as high BMI, type III achalasia, and low or high pre-operative lower esophageal sphincter pressures remained unsubstantiated based on the SAGES literature analysis. For patients failing initial surgical treatment and/or patients with recurrent symptoms, the authors found insufficient evidence to make firm recommendations.

The 2013 American College of Gastroenterology (ACG) guidelines (5) incorporated a very similar literature search and inclusion criteria as the SAGES guideline. As such, their recommendations and conclusions are broadly aligned throughout the spectrum of diagnosis and treatment algorithms. Interestingly, and perhaps relating to the organization's target audience, the authors of the ACG guidelines find no conclusive evidence for the recommendation of myotomy over pneumatic dilatation and instead conclude that both offer 'excellent-to-good efficacy' initially. The choice of initial therapy should be based on patient factors (including age, gender, and patient preference) and local institutional expertise with high volume centers of excellence for each modality being preferred. The authors' conclusions were based on two definitive studies comparing Heller's myotomy with pneumatic dilatation. The first, a systematic review conducted by Campos *et al.* [2009] (14) included 3,086 patients undergoing myotomy and 1,065 patients undergoing pneumatic dilatation. Symptom relief was reported as 89.3% *vs.* 68.2% at 12 months and 89.3% and 56.3% at greater than 36 months respectively. However, comparison was based on only a single pneumatic dilatation treatment which the ACG guideline authors highlight is not considered gold standard, with repeated dilatations being normal practice. The seminal European clinical trial by Boeckxstaens *et al.* [2011] (15) comparing Heller's myotomy with pneumatic dilatation did allow for up to three dilatations in the pneumatic dilatation arm and showed no significant difference between the two approaches. At the time of publication of these guidelines, POEM was still considered an emerging therapy predominantly being performed in the context of clinical trials.

The World Gastroenterology Organisation (WGO) Global Guidelines for dysphagia were published in 2015 (6) within which achalasia management is considered. The purposes of the guidelines are to provide diagnosis and treatment cascades which are sensitive to the fact that a full suite of diagnostic and treatment facilities are not globally available and gold-standard care is not necessarily achievable with limited resources. The achalasia management pathway is broadly aligned with previous published guidelines, but places the emphasis of the decision-making process on the available local resource in individual institutions. For the purposes of this review the WGO guidelines, whilst vital in the context for which they are designed, offer limited additional information.

The POEM era

The advent and wide spread adoption of POEM globally has resulted in a wholesale update and re-write of achalasia management guidelines. Alongside the development of POEM, high-resolution manometry has helped to delineate

a graded assessment of esophageal contractility leading to a deeper understanding of a range of pathological profiles falling within the 'achalasia syndrome'. The widespread utilization of the Chicago classification system to grade individuals' disease profile led to the opportunity for tailored management of different disease subsets.

As such, the 2017 AGA Clinical Update guidelines (7) now advocate the use of 'phenotype-directed' treatments and consideration of patient-specific parameters when selecting treatment modalities. Features to consider in the work-up would include the presence of hiatus hernia, esophageal dilatation, or an epiphrenic diverticulum, as well as high-resolution manometry delineated Chicago classification. POEM would be recommended for type III achalasia patients but only where expertise is available and can be performed in high volume centers. Whilst, at the time, limited evidence existed comparing myotomy with POEM, the guidelines suggest that both options should be considered comparable across the spectrum of the achalasia syndrome with the caveat that post-POEM patients should be considered high risk for developing esophageal reflux and should be counselled accordingly.

A final AGA clinical practice update in 2017 specifically focused on the use of endo-FLIP (Endoscopic-Functional Lumen Imaging Probe) as an emerging diagnostic and therapeutic guidance technique (8). Endo-FLIP allows for direct evaluation of esophageal contractility by focusing 'measurements on the mechanical properties of the esophagus rather than contractile patterns or bolus transit'. Early data suggest it may provide valuable additional information to standard investigations by characterizing GEJ function as the degree of luminal opening and furthermore assessing esophageal contractility. The potential for using endo-FLIP intraoperatively offers the ability to assess the effectiveness of myotomy in real time and may allow a tailored operation to be utilized. The AGA consider endo-flip to be a useful adjunct and recommend its use, where available, to provide additional information in both the diagnosis and/or intra-operative management of achalasia.

In 2018, Sami *et al.* published the updated British Society of Gastroenterology (BSG) guidelines relating to the use of esophageal dilatation (9). The authors' focus in these guidelines is largely on the technical aspects of dilatation and as such direct comparison of the management options available is not considered. The authors however find esophageal dilatation to be a safe treatment strategy and would recommend three graduated dilatations as routine. Whilst fluoroscopic guidance is normally used to improve safety and efficacy, there is a lack of data comparing fluoroscopic control with endoscopic control alone. Bougie dilators are not recommended for use in the treatment of achalasia.

POEM-specific guidelines

Whilst the AGA had previously published a clinical update guideline for the use of POEM (7), the first standard of care guidelines focusing purely on POEM were published by the Japan Gastroenterological Endoscopy Society (JGES) in 2018 (10). Due to the relatively short tenure of POEM in clinical practice, systematic reviews of the literature were based on relatively small patient numbers with short follow-up periods and the authors acknowledge that the strength of the recommendations are accordingly low. Following an international, multi-centre meta-analysis of 2,373 patients conducted by Akintoye and colleagues (16), POEM is now undeniably considered effective (98% success rate) and as such indicated in the treatment of achalasia. The development of high-resolution manometry techniques, as previously stated, has allowed the disease process to be stratified in a more accurate fashion allowing the associated treatment algorithms to become more type specific and nuanced. Accurate delineation of the proximal diseased esophageal segment by HRM has led to longer myotomies being performed and it is proposed in the Japanese guidelines that this is more easily achieved using POEM rather than performing a laparoscopic myotomy. POEM would now be recommended over alternative treatment strategies for type III phenotype patients.

The treatment options for recurrent achalasia after initial therapy is an area not widely discussed in guidelines pre-dating this publication. More data is required to stratify long term outcomes but JGES suggest that POEM would be a suitable option to consider after both failed Heller's myotomy and failed primary POEM. In this setting, POEM is not as effective as for treatment-naïve disease but it is clear that pneumatic dilatation is ineffective and POEM remains equivocal to laparoscopic myotomy for recurrent disease.

The elderly population has a 4-fold increase in disease prevalence when compared with younger patients and management options are often challenging as a result of co-morbidities and increased surgical risk. While POEM guidelines dictate that the procedure should still be performed under a general anesthetic, the relatively reduced

physiological impact of an endoscopic approach may shift the symptomatic relief versus procedural risk paradigm in favor of treatment. More evidence is again required but the impact of this in an increasingly aged population is significant and JGES guidelines would support further evaluation.

Whilst it is increasingly likely that both Heller's myotomy and POEM offer equal symptom relief, POEM results in a higher incidence of gastro-esophageal reflux disease post-procedure. The Japanese guidelines recommend that patients should consider long term antacid therapy to avoid the sequalae of persistent esophageal reflux. It is strongly commended that patients should be counselled fully about the various options available and the associated risks so that they can make an informed decision regarding their treatment options. With regard to POEM follow-up and surveillance, there is as yet no standardized policy but the JGES recommend clinic follow-up and repeat upper GI endoscopy intermittently.

The International Society for Diseases of the Esophagus (ISDE) 'I-GOAL' guidelines

The most definitive recent piece of work to be published with respect to achalasia management was published in 2018 by the ISDE (11) and pulls together the expert opinions of fifty-one specialists from eleven countries using a robust methodology and DELPHI consensus. The 'I-GOAL' (ISDE-Guidelines for Oesophageal Achalasia) guidelines acknowledge that achalasia is now treated by both gastroenterologists and surgeons and as such aims to deliver an interdisciplinary and international viewpoint, building on previously published series discussed earlier in the article. The guidelines make 46 statements of recommendation and provide the most up-to-date and inclusive report to date. Following a systematic literature search, 466 articles were considered for preparation of the guidelines representing a significant advance in the volume of data available since the SAGES publication in 2012 (214 articles). Interestingly, despite this increase in published literature, the overall GRADE quality for the evidence supporting the author's agreed statements of recommendation remained broadly low. The I-GOAL recommendations are summarized in *Table 2* for ease of reference.

Investigations

High-resolution manometry is conditionally recommended as the test of choice for diagnosis and sits alongside the utilization of the Chicago 3.0 classification system as good practice. Data suggests an almost 2-fold increase in sensitivity for achalasia with the use of HRM, however access and expertise remains limited predominantly to larger centers.

Alternative diagnostic strategies include the use of the timed barium esophagram rather than the traditional barium swallow esophogram. The data remain controversial with some authors reporting a high sensitivity and specificity of differentiating achalasia from different disease groups and others failing to demonstrate any improved prognostic/diagnostic performance (17-19). However, the test may be useful in the formal assessment of treatment outcomes specifically helping to predict those who may be more prone to recurrence. As such, the authors recommend its use within the treatment pathway for achalasia.

Endoscopy remains a vital part of the work-up process, to exclude pseudoachalasia and/or malignancy as a cause. Cardinal red flag signs which should raise the suspicion of pseudoachalasia secondary to malignancy include nodularity and ulceration at the GEJ, lack of GEJ compliance, and an inability to pass the endoscope into the stomach. Excluding alternative underlying pathology is vital and continues to be considered good practice.

Medical therapy

The authors found no convincing evidence for the medical management of achalasia and as such do not recommend the use of nitrates, calcium channel blockers, or phosphodiesterase inhibitors for symptomatic relief in these patients.

Botulinum-toxin injection

Botulinum toxin injections are still widely used by clinicians as a treatment for achalasia, however there is now convincing evidence against this as a primary treatment modality. Botox injections are considered safe with a low risk profile. Symptom improvement at 6-month are reportedly similar when compared with both laparoscopic myotomy and pneumatic dilatation. However, multiple studies and a Cochrane review (20) have now demonstrated a significant rate of recurrent symptoms in these patients from 1 year onwards. Alternative strategies are recommended for those patients under 50 years old, those fit for surgery, or those amenable to pneumatic dilatation. For patients not

Table 2 Summary of I-GOAL guideline recommendations

No.	Recommendation	Strength of recommendation
1	HRM is test of choice for the diagnosis of achalasia	Conditional recommendation
2	The Chicago classification system is a useful tool	Recommended
3	Timed Barium Swallow should be adopted into diagnostic pathways and to assess treatment outcomes	Conditional recommendation
4	Endoscopy should be performed to exclude malignancy	Recommended
5	The Eckhardt score should be used to assess patients as part of initial work-up and in follow-up period	Recommended
6	Botox should be reserved for those patients unfit for surgery or for symptomatic bridge to more definitive therapies	Recommended
7	Repeat treatments with Botox are safe, but efficacy is lower than that following initial treatment	Conditional recommendation
8	Graded pneumatic dilatation is an effective treatment for achalasia	Strong recommendation
9	Post PD patients should be observed for 4 hours post procedure to observe for symptoms	Conditional recommendation
10	POEM is an effective therapy for achalasia both in short- and medium-term follow-up with results comparable to Heller myotomy for symptom improvement	Conditional recommendation
11	Treatment of achalasia with POEM is associated with a higher incidence of GERD compared to alternative therapies	Recommended
12	POEM as feasible and effective for symptom relief in patients previously treated with previous endoscopic therapies	Conditional recommendation
13	POEM is an appropriate treatment for symptom persistence/recurrence after laparoscopic myotomy	Conditional recommendation
14	Appropriate training with in vivo/in vitro animal model and adequate proctorship should be considered before starting a clinical program of POEM	Recommended
15	The best outcomes for LHM are achieved 90.4% in (Chicago) type I & type II achalasia patients	Strong recommendation
16	Laparoscopic Heller cardiomyotomy should be extended at least (6 cm proximal to the GEJ and at least 2 cm distal to the GEJ)	Conditional recommendation
17	Partial fundoplication should be added to laparoscopic myotomy in patients with achalasia to reduce the risk of subsequent gastro-esophageal reflux	Strong recommendation
18	Standard endoscopic or surgical therapies in surgically naïve achalasia patients with sigmoid-shaped esophagus are recommended	Conditional recommendation
19	Symptom improvement is the most relevant clinical parameter for defining the success of surgical or endoscopic treatment for achalasia	Recommended
20	Recurrent symptoms after achalasia treatment should routinely undergo repeat objective testing	Recommended
21	Timed barium swallow is a reliable method to assess recurrence of achalasia	Conditional recommendation
22	Achalasia patients carry a moderately increased risk of development of squamous esophageal cancer 10 years or more from the primary treatment of achalasia. Patients should be informed of this risk	Recommended
23	Patients who are fit for surgery and have symptomatic recurrences after several pneumatic dilations should be considered for Heller myotomy or POEM	Conditional recommendation
24	LHM is an effective therapy for symptom recurrence after primary treatment with Botox Injection	Conditional recommendation
25	PD, compared with repeat myotomy or POEM, is the first option for treatment after failed Heller myotomy	Conditional recommendation
26	Barium swallow is the most accurate investigation to properly define end-stage achalasia	Recommended
27	Esophagectomy is indicated in patients with persistent or recurrent achalasia after failure of previous less invasive treatments (PD, POEM, LHM) and radiologic progression of the disease	Conditional recommendation

Adapted from original article with negative and paediatric recommendations excluded. POEM, per-oral endoscopic myotomy.

considered fit for a more durable option, repeat Botox injection is safe and feasible but subsequent treatments are likely to be less effective than the initial application. There is no evidence to support the use of intra-esophageal Botox for patients with type III achalasia.

Pneumatic dilatation

Pneumatic dilatation is widely available and historically formed the mainstay of achalasia treatment. Reported outcomes vary based on the exact definition of 'treatment success' and whether single dilatation or multiple dilatations were performed. Several studies demonstrate comparable initial results compared with myotomy, but the side effect profile is less acceptable following pneumatic dilatation. Symptom relapse rates are high with some authors reporting 48% of treated patients to be symptomatic at 5 years. Single treatment is probably not effective but graduated dilatations can be recommended based on the evidence. There is no evidence detailing the optimal timings between treatments or length of time the balloon should be inflated. Interestingly, in terms of post-procedure management and in contrast to previous guidelines, the I-GOAL authors recommend against the use of prophylactic antacid therapy following treatment unless the patients become symptomatic. Previous guidelines have suggested utilization of PPI therapy to prevent the potential long term sequalae of chronic secondary reflux disease.

POEM

POEM is commended as an effective treatment for achalasia both in short and medium-term follow-up compared with laparoscopic myotomy and pneumatic dilatation. Long term outcomes are not yet available for POEM, but the available studies comparing POEM and myotomy have certainly demonstrated equivalence if not slight superiority for POEM. There are interestingly no published studies comparing POEM with pneumatic dilatation but most commentaries assume equivalence given the outcomes previously reported between myotomy and dilatation. As POEM becomes more widely available in different institutions, it is important to note that the learning curve ranges from 4–40 cases to gain proficiency and therefore I-GOAL would suggest adequate proctorships are provided and where possible the use of simulation technology (*in vivo*, *ex vivo*, video simulation) encouraged. Similarly, given the lack of robust long-term data and evidence of increased rates of reflux post POEM, it is advised that patients should be counselled appropriately to make an informed choice regarding their preferred treatment.

Surgical treatments

The evidence base for laparoscopic Heller's myotomy has changed little since the last guidelines published by SAGES and AGA and it is therefore perhaps unsurprising that the I-GOAL guidelines draw the same conclusions. Laparoscopic cardiomyotomy is the favored treatment option for Chicago type I and II achalasia, with the myotomy extending 6 cm proximal to the GEJ and at least 2 cm distal to provide adequate effect. Whilst there are no studies comparing the proximal myotomy length and outcomes, the proximal extent of dissection would normally be limited by what is considered safe via a laparoscopic transhiatal approach and distally would include the GEJ high pressure complex which on average is less the 4 cm in length. A partial but not full fundoplication is recommended to prevent the risk of subsequent reflux disease. There is no evidence to suggest that this affects the post-operative swallowing function.

Recurrent achalasia

For patients failing initial treatment, the treatment algorithm becomes challenging and complex. The recommendations suggest that patients failing dilatation should be offered myotomy or POEM for symptom relief. In patients with a relapse of symptoms post-Botox injection, myotomy can be safely performed and would be the preferred option. Patients who have undergone a myotomy as primary treatment are recommended to have pneumatic dilatation with reported success rates of between 50–90%. The evidence suggests that the efficacy of PD when compared to re-do myotomy or POEM is similar and as such it is considered reasonable to offer a less invasive intervention in the first instance. This is not the case, however, for patients failing primary POEM. In this patient cohort, reported literature shows PD to have poor efficacy and repeat POEM or rescue Heller's myotomy should be considered. There is however a paucity of data in this area with only small anecdotal numbers, and whilst three trials continue to recruit, the I-GOAL authors felt unable to offer formal recommendations in this area.

Conclusions

Whilst guidelines clearly aid clinicians in their decision-making process and effectively assess and summarize the evolving data, it is increasingly recommended that management of complex benign upper gastrointestinal pathology should be discussed at multi-disciplinary team (MDT) meetings. Achalasia is a disease managed by both physicians and surgeons and, as such, encouraging this open forum for discussion could be very valuable. With the evolution of more advanced diagnostics, individualizing treatment strategies to the patient is vital rather than assuming a one size fits all approach. The evolution of achalasia guidelines over the next few years will be dominated by longer-term outcome data of POEM, the development of robotic myotomy, and potentially the advent of stem-cell therapies to cure rather than palliate the disease. Achalasia remains an uncommon disorder and, with this in mind, it is worth considering that developing and maintaining an expert skill set can be challenging. Where resources and local care networks permit, consideration should be given to centralizing treatment to specialized high volume centers, with objective pre- and post-procedural investigations to improve patient outcomes and deliver dedicated research outcome measures to guide our practice further into the future.

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