Follow-Up and Surveillance

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Abbreviations

GE junction	Gastroesophageal junction
GERD	Gastroesophageal reflux disease
GERD-HRQL	Gastroesophageal reflux disease health-related quality of life
GERDSS	GERD symptom scale
LES	Lower esophageal sphincter
POEM	Per-oral endoscopic myotomy

Introduction

As there is no cure for achalasia, the goals for the management of achalasia are focused on improving esophageal emptying through a reduction in the relative obstruction at the gastroesophageal (GE) junction, to relieve patient's symptoms and prevent further dilation of the esophagus [1]. Laparoscopic Heller myotomy, botulinum toxin injection, and endoscopic pneumatic dilatation have long been considered the options for the treatment of achalasia in attempts to decrease the lower esophageal sphincter (LES) pressure. However, the effects of botulinum toxin injection and endoscopic pneumatic dilatation are usually temporary and repeated treatment is often required. As a result, laparoscopic Heller myotomy has been shown to provide the more definitive and durable treatment of achalasia with improved relief

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of dysphagia as well as less postoperative gastroesophageal reflux due to the addition of a partial fundoplication procedure [2].

However, POEM is an emerging and now well-documented endoscopic technique for the treatment of achalasia in which the circular muscle fibers are divided within a submucosal tunnel created from a mucosotomy made within the esophageal lumen [3]. It confers the safety and advantages of endoscopy, being less invasive than surgery with the added benefit of a surgical myotomy and being a salvage second-line treatment after other methods have failed. It has been shown to have good symptomatic relief of dysphagia, but given the lack of a concurrent antireflux procedure, postoperative reflux and its complications remain a concern in the postoperative period. This chapter aims to discuss the long-term subjective and objective outcomes of POEM and the role of surveillance following POEM.

Follow-Up

The goal of surveillance is to determine if there has been any symptomatic and/or functional improvement in esophageal function and to determine if any further interventions are required, especially given that there is no specific cure for achalasia. Surveillance is particularly important given that approximately 10–15% of patients with achalasia who have undergone treatment will continue to have progression of esophageal diameter leading to mega-esophagus, with up to 5% of patients eventually requiring esophagectomy [4]. Following POEM, patients are generally seen in clinic follow-up in both short-term and long-term intervals as data has shown that surveillance strategies, with either endoscopic or radiologic modalities, may be beneficial after a disease duration of more than 10–15 years with an interval of every 3 years [5].

The Eckardt symptom score has been typically used to assess for achalasia symptom severity by measuring the extent of dysphagia, regurgitation, chest pain, and weight loss. By obtaining the Eckardt score both prior and post-POEM (Fig. 12.1), patients can be monitored for symptomatic improvement and treatment

Score	Dysphagia	Regurgitation	Retrosternal pain	Weight loss (Kg)
0	None	None	None	None
1	Occasional	Occasional	Occasional	<5
2	Daily	Daily	Daily	5-10
3	Each meal	Each meal	Each meal	>10

Fig. 12.1 Eckardt score

efficacy following POEM. A meta-analysis by Talukdar et al. did demonstrate a statistically significant reduction in the improvement of Eckardt's score following POEM and was found to have a comparable efficacy compared to Heller myotomy [6]. Furthermore, this effect on subjective improvement in achalasia symptoms was demonstrated in patients seen in follow-up for up to 3 years following POEM [7, 8].

However, patients' symptoms following POEM may not necessarily be a reliable indicator of functional improvement after treatment as symptom resolution can occur without a significant improvement in esophageal emptying, which can place the patient at risk for developing long-term complications of achalasia such as mega-esophagus [4]. As such, patients should also undergo objective testing following POEM to demonstrate clinical response, such as high-resolution manometry and timed barium esophagram. Multiple studies have demonstrated that upright timed barium esophagram can predict treatment success and requirement for future intervention. Vaezi et al. demonstrated that there was an approximate 73% concordance between the degree of symptom improvement and degree of esophageal emptying by barium esophagram in patients with achalasia treated with pneumatic dilation. Furthermore, there was an association and predictive value seen in patients with poor esophageal emptying on barium esophagram in the context of complete symptom resolution and symptom relapse at 1 year. Patients in this treatment group were found to benefit from more intensive follow-up regardless of symptoms due to the risk of relapse and, as such, it was found to be reasonable to repeat barium esophagram annually to assess for esophageal emptying [9].

Esophageal manometry has also been cited as an indicator for treatment outcome, given that the diagnosis of achalasia is dependent on the manometric description of LES function. Numerous studies have supported that an LES pressure of 10 mmHg can be correlated with and can predict clinical response as well as remission in patients treated with pneumatic dilatation [10]. Despite this, manometry is not routinely used in this manner because it is more invasive and less widely available than barium esophagram. Although both timed barium esophagram and manometry can be used to assess short-term treatment success and predict long-term outcomes after pneumatic dilation, further studies are needed to infer its utility and predictability for treatment effects post-POEM.

There has also been particular interest in the extent of gastroesophageal reflux (GERD) following POEM, given that there is no combined anti-reflux procedure in contrast to Heller myotomy. The rate of postoperative reflux has been found to vary widely in numerous published studies, ranging from 0 to 53% [11–13]. Given this variability, there has been debate whether all patients following POEM should be treated with acid suppression. Standardized symptom scales, such as the gastroesophageal reflux disease health-related quality of life (GERD-HRQL) (Fig. 12.2) and GERD symptom scale (GERDSS) (Fig. 12.3), have been used to attempt to

Scale:
0 = No Symptoms
1 = Symptoms noticeable, but not bothersome
2 = Symptoms noticeable and bothersome, but not every day
3 = Symptoms bothersome every day
4 = Symptoms affect daily activities
5 = Symptoms are incapacitating, unable to do daily activities

1. How bad is your heartburn?	0	1	2	3	4	5
2. Heartburn when lying down?	0	1	2	3	4	5
3. Heartburn when standing up?	0	1	2	3	4	5
4. Heartburn after meals?	0	1	2	3	4	5
5. Does heartburn change your diet?	0	1	2	3	4	5
6. Does heartburn wake you from sleep?	0	1	2	3	4	5
7. Do you have difficulty swallowing?	0	1	2	3	4	5
8. Do you have pain with swallowing?	0	1	2	3	4	5
9. Do you have bloating or gassy feelings?	0	1	2	3	4	5
10. If you take medications, does this affect your daily life?	0	1	2	3	4	5

11. How satisfied are you with your present condition?
Satisfied Neutral Dissatisfied

12. Are you currently taking any medications for heartburn or GERD? Yes No

Fig. 12.2 GERD-HQRL. *Scale*: 0 = No symptoms. 1 = Symptoms noticeable, but not bothersome. 2 = Symptoms noticeable and bothersome, but not every day. 3 = Symptoms bothersome every day. 4 = Symptoms affect daily activities. 5 = Symptoms are incapacitating, unable to do daily activities

quantify gastroesophageal reflux disease health-related quality of life. Objectively, 24 h or 48 h pH monitoring, typically performed 6 months following POEM, has been utilized to determine evidence of pathologic acid reflux defined as a DeMeester score greater than 14.72 in a 24 h period. Jones et al. demonstrated that there was no correlation between subjective symptoms of GERD and objective pH testing for pathologic acid reflux following POEM, with 58% of patients with documented abnormal distal esophageal acid exposure not experiencing clinical symptoms of reflux, which is consistent with results in achalasia patients treated with Heller myotomy [14, 15]. Given the lack of correlation, we recommended that all patients following POEM undergo routine postoperative pH monitoring and esophagogastroduodenoscopy to identify and treat patients at risk of long-term complications of uncontrolled acid reflux, such as esophagitis, stricture, and recurrent dysphagia, and

Symptom	Grade	
Dysphagia	1	Occasional with course foods (meat sandwich, hard roll) lasting for a few seconds
	2	Requiring clearing with liquids
	3	Severe - semi - liquide diet or history of meat impaction
	4	For liquids
Chest pain	1	Minimal or occasional episodes
	2	Moderate, reason for visit
	3	Severe, interfering with daily activities
Regurgitation	1	Mild, after straining and/or after large meals
	2	Moderate - predictable with position change, straining or lying dowm
	3	Severe - constant regurgitation, presence of aspiration
Heartburn	1	Minimal, identifiable symptoms, occasional episodes, no prior mwdical visit
	2	Moderate - primary reason for visit
	3	Severe - constant marked disability in activities of daily life

Fig. 12.3 GERD symptom scale; http://www.hon.ch/OESO/books/Vol_5_Eso_Junction/Articles/Images/img130-1.jpg

to avoid unnecessary long-term proton pump inhibitor therapy in patients with normal esophageal acid exposure.

Patients with achalasia are also at a substantially increased risk of developing esophageal squamous cell carcinoma and adenocarcinoma theoretically due to poor esophageal emptying and increased acid exposure leading to dysplasia and, eventually, carcinoma. However, at this time, there is insufficient data to support the routine endoscopic surveillance for esophageal cancer, given the low incidence and poor outcomes once the diagnosis is made [16].

Currently, the data is limited by the length of follow-up as POEM is still an emerging technique for the treatment of achalasia. As a result, more long-term studies are required to demonstrate the effectiveness of POEM, which will help to determine defined surveillance strategies to prevent disease progression and identify treatment failure, using both subjective symptom scale surveys and objective testing.

Conclusion

POEM has been shown to be an effective treatment for achalasia, but further studies are required to determine its long-term efficacy. As there is no targeted treatment to restore normal esophageal smooth muscle function, patients with achalasia should undergo long-term routine assessment of symptom relief and objective testing of esophageal emptying. Furthermore, given the increased risk of pathologic gastroesophageal reflux with the lack of an anti-reflux procedure, there is evidence to support the benefit of routine pH monitoring and esophagogastroduodenoscopy to identify those patients with pathologic acid reflux who require long-term proton pump inhibitor therapy.

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