

ANALYSIS OF THE IMPLEMENTATION OF ENDOSCOPIC TREATMENT FOR ACHALASIA USING THE POEM TECHNIQUE

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Abstract

Description of the first cases of Peroral Endoscopic Myotomy (POEM) performed at Virgen del Rocío Hospital. The objective of the study is to assess outcomes, evaluate complications, and demonstrate treatment efficacy.

We prospectively analyzed treatment efficacy and complication occurrence at 3-6 months post-procedure. Changes in anthropometric parameters and symptom-related quality of life were considered, utilizing various subjective scales such as Eckardt, EAT-10, or MDADI.

The initial 26 cases from March '22 to October '23 were collected, including 3 type I achalasia, 21 type II, and 2 type III. One case had prior treatment with toxin, one with toxin and

dilation, and another with dilation, the rest were treatment-naive. Mean age was 50 years.

Average intervention time was 86 minutes per procedure, with no notable incidents; Four pneumocenteses were performed. No major complications during hospital stay, with a two-day hospitalization period, all tolerating blended diet upon discharge. Improvement in symptoms and quality of life was observed in all cases, with an associated mean weight gain of 9.2 kilograms.

Six-month manometry showed hypotonia/normotonia of the lower esophageal sphincter in all cases examined. Endoscopy in 11 patients revealed grade A esophagitis in 4 of

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them, controlled heartburn with proton pump inhibitors (PPIs) in 100% of patients.

POEM as a safe and effective treatment in expert hands. Manageable number of complications and procedure duration. Gastroesophageal reflux as the most common symptom, without serious consequences and controlled under PPI therapy.

Keywords: achalasia, POEM, endoscopy.

Introduction

The treatment of achalasia has been revolutionised in recent years by the implementation of advanced endoscopic techniques of the third space, beyond botulinum toxin injection, dilations and laparoscopic Heller myotomy associated with fundoplasty as a surgical alternative¹⁻³.

Since the first peroral endoscopic myotomies (POEM) were performed at the beginning of this century, many centres have made efforts to train and implement this technique as a minimally invasive alternative for the treatment of achalasia.

The evidence from various published studies points to similar results to the surgical alternative, with fewer serious complications, although with a higher rate of GER than in cases undergoing surgical myotomy^{1,2,4,5}.

The main objective of this study was to collect information on the first cases of POEM performed at the Virgen del Rocío University Hospital; to identify the patient profile, collect parameters intrinsic to the technique, monitor the occurrence of adverse effects and complications, and demonstrate efficacy based on surveys based on symptom assessment and improvement in quality of life.

Material y methods

Prospective descriptive observational study of the first 26 cases undergoing POEM in our centre, between the months of March 2022 and October 2023. All patients included had received a diagnosis of achalasia based on endoscopic findings, oesophagogastrroduodenal barium study and high-resolution oesophageal manometry (HRM).

All cases were performed in a chirophanised ward with anaesthetic support, orotracheal intubation and invasive mechanical ventilation. They received oral Fluconazole the previous week. They were performed with the Hybrid knife T dissector (ERBE) and ERBE-jet injection system, with pressures

of 40 bar (15-20 bar in cardia) and VIO3 electrosurgical source. Posterior myotomy was performed in all 26 patients⁶.

The protocol established the introduction of a liquid diet 24 hours after the procedure and a triturated diet 48 hours later. During admission, empirical antibiotic therapy was started with Amoxicillin/Clavulanic acid, which was maintained for 5 days, or Ciprofloxacin in those patients with confirmed drug allergies.

Anthropometric assessment parameters were collected prior to the intervention and at 3-6 months. The assessment of achalasia-related symptoms and their impact on quality of life was also carried out. For this purpose, we used the specific Eckardt (Figure 1) and EAT-10⁷ (Table 2) scales, but given that these scales do not include variables that specifically assess the psychosocial sphere of the patients, we decided to add the MDADI scale⁸ (Table 3), specific for the assessment of dysphagia in patients with head and neck tumours, and extrapolate the assessment to patients with achalasia. This assessment was also performed prior to the procedure and at 3-6 months after the intervention.

Other parameters were also analysed, such as geographical dispersion of the patients, type of achalasia, duration of the procedure, endoscopist, hospitalisation time, the occurrence of immediate and delayed complications, as well as the need for pneumocentesis.

Results

A total of 26 patients from different healthcare areas of western Andalusia were included (50% from the Virgen del Rocío Univ. H. area, the rest referred from other centres). The mean age was 50 years, with a range between 17 and 74 years, with a female/male ratio of 1:1. Anthropometric parameters were determined before the procedure, with a mean weight of 71.12 kg (range: 50-120 kg), with a mean BMI of 26.

The most prevalent type of achalasia in our series was type II, accounting for 81% of patients (21 cases), 11% were type I (3 cases) and 8% were type III (2 cases). A total of 88.5% had not received any previous endoscopic or surgical treatment, while 11.5% received previous endoscopic treatment, endoscopic dilatations (1), botulinum toxin injections (1) or both options (1).

Endoscopic myotomies were performed by two endoscopists with extensive experience in endoscopic submucosal dissection (ESD). The first eight cases were performed under the supervision of an expert tutor, with

advice during the procedure, but without tutor intervention. Subsequently, the remaining POEMs were performed autonomously and alternately by each endoscopist. The mean duration of the POEM was 86 minutes with a range of 50 to 145 minutes (Figures 1 and 2), with no notable incidents and the need for pneumocentesis, during or at the end of the procedure, in 4 patients.

The average hospitalisation time was 2 days, with the introduction of a liquid diet after the first 24 hours and a triturated diet after 48 hours. Symptom and quality of life assessment scales were applied by telephone and/or face-to-face at six months after POEM.

In all cases there was a great improvement in symptoms at three months, with a mean score on the EAT-10 and Eckardt scales <3 points after the procedure. As for the MDADI scale, which includes items referring to the patients' quality of life, there was a marked improvement, with a mean score of 95.69 points (Table 4). This was accompanied by an objective weight gain of 9.2 kilograms at six months (Figure 3).

Gastro-oesophageal reflux (GER) was the most frequent undesirable effect, in line with what is described in the scientific literature, and was present in 50% (13 cases) of the patients surveyed. All with symptoms controlled with PPIs and with expression of mild oesophagitis (Los Angeles grade A) in 4 cases out of a total of 11 examinations. Six control manometry scans were performed and hypotonia/ normotonia was found in 100% of cases (Figure 3).

There were no significant differences in the type of patients treated, examination time, incidence of complications, symptomatic improvement or presence of GER between the two endoscopists.

Discussion

Endoscopic treatment of achalasia by performing peroral endoscopic myotomy (POEM), is safe and effective, achieving significant improvement in symptoms and quality of life^{1,2,5}. It is feasible to incorporate this technique through a specific training programme for expert endoscopists, with very good results.

Both the mean operative time and hospital stay were significantly shorter for the endoscopic technique compared to the surgical technique (86 minutes in our study compared to 97.6 minutes described in some reviews)¹. Recovery was early, with all patients tolerating a triturated diet at discharge. It is also worth noting the absence of relevant complications in the entire series, including the first cases, both during the intervention and in the subsequent evolution, which reinforces the safety of this procedure.

The scales described above (Eckardt, EAT-10 and MDADI) showed a great improvement in both symptoms and quality of life after endoscopic intervention. Most patients were asymptomatic at clinical examination. In symptomatic patients, the main symptom was mild GER which was controlled with single dose PPI treatment, as described in published series^{4,5,6}. Also, in the follow-up endoscopy, peptic lesions were mild (grade A) and not always correlated with clinical GER.

Given the published clinical evidence and the experience at our centre, we believe that the development of this technique represents a paradigm shift in the therapeutic algorithm for achalasia, with POEM being non-inferior to classic surgical treatment, and therefore both treatment options should be offered to a patient diagnosed with achalasia^{1,2,5}. The other classical endoscopic treatment options (botulinum toxin and pneumatic dilatation) should be relegated to special cases, mainly for patients rejected for POEM due to high anaesthetic risk.

| (0-12) | Eckardt scale | | | |
|--------|------------------|---------------|---------------|---------------|
| | Weight loss (kg) | Dysphagia | Regurgitation | Chest pain |
| 0 | Absence | Absence | Absence | Absence |
| 1 | <5 | Occasional | Occasional | Occasional |
| 2 | 5 to 10 | Daily | Daily | Daily |
| 3 | >10 | At every meal | At every meal | At every meal |

Table 1. Assessment of achalasia symptoms using the Eckardt scale (0-12 points).

| Questions set out in EAT-10 | 0-40 |
|--|------|
| 0= not a problem 1 2 3 4= is a serious problem | |
| My swallowing problem causes me to lose weight | |
| My swallowing problem interferes with my ability to eat away from home | |
| Swallowing liquids is an extra effort for me | |
| Swallowing solids takes extra effort | |
| Swallowing pills takes extra effort | |
| Swallowing is painful | |
| The pleasure of swallowing is affected by my swallowing problem | |
| When i swallow, food sticks to my card | |
| Coughing when i eat | |
| Swallowing is stressful. | |

Table 2. EAT-10 questionnaire for dysphagia assessment (0-40 points).

| M.D. Anderson Dysphagia Inventory MDADI | 0-100 |
|---|-------|
| Strongly disagree=1 Agree=2 No opinion=3 Disagree=4 Strongly disagree=5 | |
| My swallowing difficulties limit my daily activities. | |
| I am embarrassed by my eating habits | |
| People often have difficulty cooking for me. | |
| I have more difficulty swallowing at the end of the day | |
| I hold back/feel self-conscious when I eat. | |
| I feel uncomfortable with my swallowing problem. | |
| I have a hard time swallowing | |
| My swallowing difficulty causes me to lose income (earnings). | |
| I take longer to eat because of my swallowing problems. | |
| People ask me why can't you eat that? | |
| Other people are bothered by my eating problems. | |
| I cough when I try to drink liquids | |
| My swallowing problem limits my social and personal life. | |
| I have trouble eating out with my friends, neighbours and family. | |
| I limit the amount of food I eat because of my difficulty swallowing. | |
| I am unable to maintain my weight because of my swallowing problem. | |
| I have low self-esteem because of my swallowing problems. | |
| I feel as if I am swallowing too much food. | |
| I feel left out because of my eating habits. | |

Table 3. MD Anderson Dysphagia Inventory Questionnaire (100-0 points). Assessment of dysphagia and its impact on patients' quality of life.

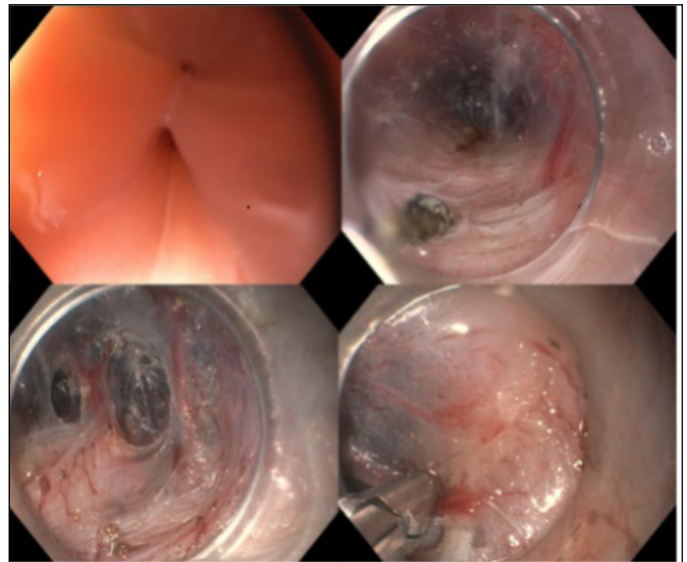


Figure 1. Graphic description of the endoscopic technique. Mucosotomy and endoscopic tunnelling can be seen, performing haemostatic treatment on the vessels located in the submucosa.

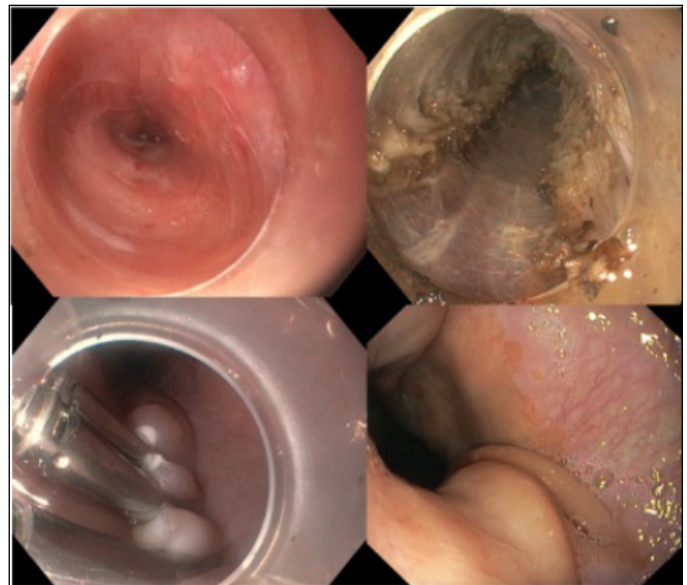


Figure 2. The result after tunneling and mucosotomy closure is shown. The lower right quadrant shows the endoscopic result months after completion of POEM.

One of the limitations of this study is that it is a short series of patients treated and from a single centre. We have also had difficulties in performing the manometric and endoscopic controls within the times established by the initial protocol (3-6 months), due to the high demand for these examinations. The lack of standardisation of the MDADI scale to specifically assess dysphagia in patients with achalasia may also be a limitation, although we believe it can be extrapolated.

We have now increased the number of cases in our series to 38, which we will evaluate to check the consistency of the

| | | |
|-----------------|--------------------|----------|
| Origin | Area HVR | 13 (50%) |
| | Other areas | 13 (50%) |
| Average age | 50 years (17 - 74) | |
| M:F | 1 (13:13) | |
| Type | I | 11% |
| | II | 81% |
| | III | 8% |
| Naive | 23 | 88.5% |
| POEM time | 86 min (50 - 145) | |
| Hospitalisation | 2 days (2-4) | |
| Weight Kg | 71.12 (50-120) | |
| BMI | 26 | |
| Weight gain kg | 9.2 | |
| Eckardt (0-12) | pre-POEM | 7.96 |
| | post-POEM | 0.67 |
| | EAT-10 (0-40) | 27.87 |
| | MDADI (100-20) | 44.71 |
| | | 95.69 |

Table 4. Summary of the most relevant results collected in the study.

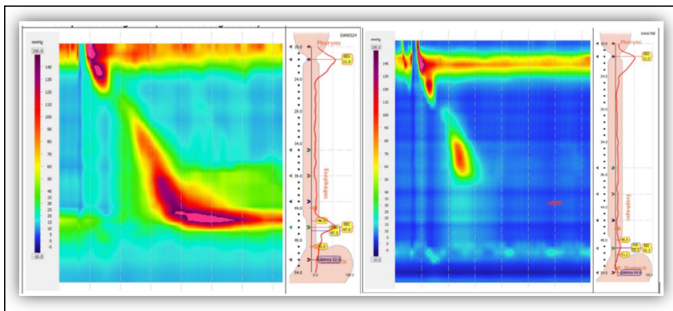


Figure 3. The manometric changes that occurred on the lower esophageal sphincter after the POEM were carried out can be seen.

results. The SAPD digestive endoscopy working group has also proposed the creation of an Andalusian registry of POEMs with the aim of carrying out a multicentre study.

Conclusions

Peroral endoscopic myotomy can be safely incorporated into the therapeutic arsenal of endoscopy with adequate tutoring, in the hands of expert endoscopists.

It is a safe technique, with few complications, achieves a long-lasting improvement in symptoms and quality of life, with reasonable operating time (< 90 min) and an average hospital stay of less than 3 days.

The most common adverse effect is gastro-oesophageal reflux, only some with mild oesophagitis and symptomatic control with low doses of PPIs.

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