

1 **Management of Eosinophilic Esophagitis associated Food Impaction in** 2 **Europe and the United States**

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68 **Abbreviations**

69 AE: Adult endoscopist

70 ECG: Electrocardiogram

71 EoE: Eosinophilic esophagitis

72 EFI: Esophageal food impaction

73 ED: Emergency department

74 ESGE: European Society of Gastrointestinal Endoscopy

- 75 PE: Pediatric endoscopist
76 LE: Less experienced
77 MAC: Monitored anesthesia care
78 ME: Moderately experienced
79 PPI: Proton pump inhibitor
80 STC: Swallowed topical corticosteroids
81 VE: Very Experienced

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123 **ABSTRACT**

124 Background and aims: Eosinophilic esophagitis (EoE) is the most common cause of
125 esophageal food impaction (EFI). Approaches to management of EFI due to EoE have not
126 been well-characterized.

127

128 Methods: We conducted a web-based survey to understand approaches to management
129 of EFI due to EoE among endoscopists. Questions focused on management of patients
130 from presentation to post-endoscopy follow-up. The survey was administered to a list of
131 eligible candidates provided by societies of gastroenterology.

132

133 Results: A total of 308 endoscopists completed the questionnaire. The majority (83%)
134 practiced in Europe and treated adults (78%). Most agreed patients should be advised to
135 seek emergency care (66%) within 1 to 2 hours (41% agreement). There was agreement
136 that medications to induce vomiting should be avoided (84%) and that blood tests or
137 imaging studies were usually not required before endoscopy. By contrast, there was
138 more variability in the type of sedation recommended and the need for endotracheal
139 intubation, especially when comparing more experienced to less experienced EoE-
140 endoscopists. Overall, fewer than half (43%) respondents recommended obtaining
141 esophageal biopsies during the initial endoscopy. However, there were significant
142 differences in the proportion who recommended biopsies based on level of EoE-
143 experience (25, 52, 77%, $p < 0.001$; less versus moderate versus very experienced) and
144 comparing pediatric versus adult endoscopists (32, versus 79%, $p < 0.001$; adult versus
145 pediatric).

146

147 **Conclusion:** There exists heterogeneity among endoscopists in recommendations to
148 manage EFI in patients with EoE. These findings support development of clinical
149 guidelines and new studies to clarify the rationale for best practices.

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151 **KEY WORDS:** esophagus, esophageal food impaction, eosinophilic esophagitis

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157 **Key summary**

158 **Established Knowledge**

159 - The optimal management of patients with esophageal food impaction due to
160 eosinophilic esophagitis from presentation at the emergency department to
161 postendoscopy care is unclear

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163 **New findings**

164 - Considerable recommendation variation exists in the management of EFI in patients
165 with EoE.

166 - Our findings provide a rationale for the creation of consensus practice guidelines and
167 further study into best practices.

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177 **Introduction**

178 Eosinophilic esophagitis (EoE) is a chronic, immune-mediated inflammatory
179 disease of the esophagus commonly complicated by and presenting as esophageal food
180 impaction (EFI). In many studies, EoE is the most common cause of EFI in patients
181 presenting to the emergency department (ED).¹ Despite the increasing disease burden
182 of EoE,² EoE related EFI,^{3,4} and risks of EFI,⁵ few studies have identified best practices
183 for management of EFI in patients with established or suspected EoE.

184 EoE related EFI poses several important considerations. First, EFI may represent
185 the initial presentation of EoE and should raise a high index of suspicion for this
186 diagnosis. Second, EoE related EFI can occur in the setting of active mucosal
187 inflammation or chronic remodeling and stricture each of which requires a different
188 therapeutic approach. Third, because EoE is a chronic condition, disimpaction may have
189 been performed previously and, consequently, approaches may vary based on prior
190 outcomes with dilation. Each of these factors may influence care before, during and after
191 endoscopic assessment and treatment.

192 Most studies of EoE related EFI were retrospective analyses and case series,⁶ and
193 thereby offer little guidance on optimal approaches to management considering
194 important outcomes such as successful disimpaction, and minimization of complications
195 related to perforation and bleeding. The available evidence suggests that biopsy and
196 dilation of EoE patients are safe with very low rates of perforation,⁷ but consensus has
197 not been achieved on the optimal management of EFI in patients with known or
198 suspected EoE.

199 We developed a survey to help characterize current approaches to practice in
200 patients with EFI due to EoE from clinical presentation to post-endoscopy care. We
201 aimed to answer the following questions. First, is there considerable heterogeneity with

202 respect to EFI approaches among endoscopists? Second, in which clinical domains does
203 a considerable heterogeneity exist? And third, we aimed to understand current
204 approaches that can help guide development of consensus guideline as well as informing
205 the research agenda for management of this condition.

206

207 **Methods**

208 We developed a web-based survey using the REDCap platform (Clinical Trials
209 Unit of University Hospital Zurich) to determine how gastroenterologists manage EFI.
210 The questionnaire was created based on opinions from an international group of EoE
211 experts (The International Gastrointestinal Eosinophil Researchers, TIGERS). It was
212 comprised of 38 questions of how EFI should be managed. It included 6 socio-
213 demographic questions (gastroenterology specialty, country of practice, practice setting,
214 duration of practice, experience in the treatment of EoE patients, experience in treating
215 food impaction), 3 questions about prehospital care, 23 questions about in-hospital and
216 endoscopy management and 6 questions about follow-up after EFI (Supplementary
217 figure 1).

218 The survey was distributed to members of national gastroenterology professional
219 societies/organizations within Europe and the United States: Swiss Society of
220 Gastroenterology (SGG/SSG), Danish Society of Gastroenterology, European Society for
221 Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN), Swedish Society of
222 Gastroenterology, the Young Hepatogastroenterologists in Bulgaria, Berufsverband der
223 Gastroenterologen Deutschland (BVGd), European Consortium for Eosinophilic Diseases
224 of the Gastrointestinal Tract (EUREOS), the American Gastroenterological Association
225 (AGA), American College of Gastroenterology (ACG) and members of TIGERS. In Europe,

226 the distribution of the survey via email to their members was the responsibility of the
227 national societies.

228

229 There was no incentive to participate in the survey and all responses were anonymous.
230 Respondents provided consent at the beginning of the survey.

231 Next to descriptive statistics, we analyzed the difference in the “best practice
232 management” between more and less EoE-experienced endoscopists (0-1 EoE
233 patients/months = less experienced (LE), 2-10 EoE patients/months = moderately
234 experienced (ME) and > 10 EoE patients/months = very experienced (VE)) and pediatric
235 (PE) versus adult endoscopists (AE).

236 All statistical analyses were performed by an epidemiologist from the Institute of
237 Social and Preventive Medicine of University of Bern (ES), using the statistical program
238 Stata (version 16.1, College Station, Texas, USA). Categorical data were summarized as
239 the percentage of the group total. For quantitative data, differences in distribution
240 between two groups were evaluated using the Wilcoxon-Mann-Whitney rank test.

241

242

243 **Results:**

244 **Study population**

245 A total of 335 surveys between September 2020 and January 2021 were
246 completed. After exclusion of 20 surveys that were completed by providers not certified
247 in GI or endoscopy and 7 with missing data, a total of 308 surveys were analyzed.

248 Respondents were classified as gastroenterologists (99%, 78% adult and 22% pediatric)
249 and otolaryngologists, other surgeons or allergists specialized in EoE (1%). Most (83%,
250 254) practiced in Europe and in a hospital-based setting (83%, 256).

251 Length of work experience was well distributed (0-5 years: 22% (67), 6-14 years:
252 41% (126), 15-24 years: 22% (69), >24 years: 15% (46)). Experience of treating EoE
253 patients varied among the responders: 46% (143) of respondents saw 0-1 EoE patients
254 per month (“less experienced, LE”), 39% (121) saw 2-10 (“moderately experienced,
255 ME”), and 15% (44) saw over 10 EoE patients per month (“very experienced, VE”). Most
256 respondents regularly treated EFI (0 EFI/month: 25% (76), 1-5 EFI: 73% (224), > 5 EFI
257 2% (8)).

258 Responders working in a hospital-based setting had more experience in treating
259 EoE patients than responders working in a private-based setting (LE: 44% versus 17%,
260 ME: 39% versus 40%, VE 17% versus 4%, $p = 0.015$, hospital versus private practice).
261 PE (pediatric endoscopists) had more experience in treating EoE patients than AE (adult
262 endoscopists) (LE: 21% versus 54%, ME: 57% versus 34%, VE: 22% versus 12%; $p <$
263 0.001 , PE versus AE) and worked more in a hospital-based setting 96% versus 80% PE
264 versus AE).

265 Results from the surveys stratified along two different lines based on experience
266 with EoE patients and whether the respondent was an adult (241) or pediatric (67)
267 providers. Thus, some results below are reported as such.

268

269 **Prehospital care**

270 84% (258) responded that vomiting should not be induced, 85% (263) that
271 medications should not be administered, and 66% (202) that patients should seek
272 immediate ER care within 1-2 hours (41%, 125) (see Table 1). PE and endoscopists with
273 more EoE-experience (ME and VE) recommended earlier ER referral (see
274 Supplementary table 1 and Supplementary table 2).

275

276 **Emergency department and endoscopic management**

277 Survey responses indicated a straightforward approach to disimpaction without
278 use of blood or radiographic studies (See Table 1). In contrast to more EoE-experienced
279 providers, less EoE-experienced providers supported obtaining blood work and an ECG
280 before endoscopy more often (see Supplementary Table 1).

281 With respect to sedation, a wide range of responses identified several aspects of
282 anesthetic for use during disimpaction. While almost all providers recommended some
283 form of anesthesia for disimpaction, significant differences existed between use of
284 anesthesiologist services and approaches toward airway protection. In general, AE
285 performed conscious sedation without use of an anesthesiologist whereas most PE
286 preferred anesthesiologist administered sedation with endotracheal intubation.
287 Another differentiating factor for these approaches related to the EoE patient
288 experience. For example, VE providers were more likely to recommend monitored care
289 than ME and LE. Finally, the presence of co-morbidities appeared to influence the choice
290 of sedation. (Figure 1A and 1B and Figure 2A and 2B). With regard of the origin of the
291 endoscopist, a subanalysis demonstrated that US providers recommended more often
292 monitored anesthesia care with endotracheal intubation than providers from Europe.
293 (see Supplementary table 3).

294 With respect to disimpaction, there was general agreement that a
295 gastroenterologist should perform the disimpaction. Significantly more AE
296 recommended attempting to gently push the food bolus into the stomach compared to
297 PE (48% versus 19%, AE versus. PE $p<0.001$). Both AE and PE did not use an overtube
298 and PE preferred to do this only when patients were intubated. Most providers used a
299 Roth Net to retrieve food but a wide range of instrumentation was used.

300 Fewer than half (43%) of all respondents recommended taking esophageal
301 biopsies; those recommending biopsies were more experienced with EoE (25% versus
302 52% versus 77%, $p < 0.001$; LE versus ME versus VE) and were more likely to be PE
303 (33% versus 79%, $p < 0.001$; AE versus PE). These findings were in general the same
304 whether the patient had a previous diagnosis of EoE or not. Importantly, 37% of AE and
305 9% of PE do not take esophageal biopsies during the initial disimpaction. Finally, at the
306 time of initial disimpaction, 76% of AE and 46% of PE did not recommend a dilation;
307 those with more experience with EoE, were more inclined to perform dilation.

308 With respect to discharge, most participants agreed to discharge the patient after
309 tolerating liquids but some recommended a 24 hour stay (14% and 28%, AE and PE).

310

311 **Follow-up after EFI**

312 70% of participants agreed that first follow-up post ED visit should occur in a GI
313 clinic (Figure 3) within one month after EFI. In case of spontaneous bolus resolution at
314 the ER before endoscopy, there was an agreement that an outpatient endoscopy should
315 be performed. However, there was no consensus at what time frame it should be
316 provided (Figure 4). When biopsies were obtained, providers in general recommended
317 starting treatment for esophagitis including a PPI, topical steroids or dietary
318 interventions. If biopsies were not obtained, most providers recommended patients
319 undergo repeat endoscopy with biopsy prior to prescribing a treatment. In patients
320 having received a PPI after EFI resolution, but without having had biopsy taken, only
321 27% recommended an endoscopy off PPI therapy. Responses regarding repeating
322 endoscopy after EFI were similar (48% and 42% AE and PE) supporting repeat EGD and
323 the remainder supporting repeat under specific circumstances.

324

325 **Discussion:**

326 Our survey describes substantial variation of recommendations in case of EFI due to EoE
327 among 308 adult and pediatric endoscopists with a range of experience from Europe
328 and the US, including several EoE-experts. Nevertheless, there were areas where there
329 relatively greater agreement. Most endoscopists did not recommend induced vomiting,
330 routine blood or imaging test. Exceptions were patients potential complications such as
331 severe chest pain, hematemesis, signs of sepsis, or other markers of clinical instability.
332 Adult endoscopists recommended that patients remain fasting, and an endoscopy be
333 performed as soon as possible. Most adult endoscopists agreed that the push technique
334 for food bolus disimpaction may be attempted with gentle pressure and with caution. By
335 contrast, pediatric gastroenterologist generally recommended that the push technique
336 be avoided. Most respondents agreed that clinical follow-up should be obtained within
337 one month of disimpaction.

338

339 *Evaluation at time of EFI*

340 We described several interesting findings specifically related to timing before ED
341 evaluation, pre-endoscopic evaluation, and anesthetic planning. More than 80% of
342 endoscopists recommended avoiding induction of vomiting, using any medication, and
343 nearly 50% recommended seeking medical help within 1 hour after EFI regardless of
344 whether the diagnosis of EoE was known.

345 In line with the European and the American Societies of Gastrointestinal
346 Endoscopy (ESGE, ASGE) guidelines,^{8,9} the majority of respondents recommended
347 against radiologic evaluation, a blood analysis or an ECG for patients with a nonbony
348 food impaction without complications. There was approximately 60% agreement that
349 the endoscopist on duty should perform an endoscopy as soon as possible. This finding

350 may be surprising when considering that ESGE⁸ recommends endoscopy in 6 hours, or
351 in 24 hours, in patients with complete or incomplete obstruction, respectively. One
352 possible explanation is that an obstruction can be painful and prolonged obstruction
353 increases the risk of aspiration and/or perforation. However, a recently published
354 retrospective study demonstrated an equal rate of complications in EFI treated after 12
355 hours compared to EFI treated within 12 hours.¹⁰

356 Regarding the type of sedation and whether an endotracheal intubation is
357 necessary in patients with EFI, the recommendation of the respondents varied among
358 those who are more or less experienced with EoE and across AE and PE. It is not
359 surprising that nearly all PE recommended monitored anesthesia care (MAC) and an
360 endotracheal intubation in case of EFI. Interestingly, in AE, only the more EoE-
361 experienced endoscopists recommended MAC and endotracheal intubation more often.
362 A large case series of EFI indicated an increased rate of adverse events in patients with
363 elective intubation.⁵ Nevertheless, since most adverse events were associated with the
364 EFI itself and not with the intubation, it can be hypothesized that intubated patients may
365 have suffered from more complicated EFI and that without intubation the rate of
366 adverse events would have been even higher.⁵

367 Our results may be influenced by the fact that regulations regarding
368 administration of sedatives, especially disoprivan, are determined at national level and
369 that not all AE have experience with non-anesthesiologist-administered sedation
370 (NAAP). However, our questionnaire intended to reflect a “best practice” approach and
371 not to evaluate how food bolus disimpaction is managed in the specific countries in real
372 life. Hence, we may assume that our findings reflect the endoscopists’ intentions and
373 may not account for limitations/challenges around access to anesthesia services.
374 Furthermore, when only considering European AE, which are familiar with NAAP, the

375 results were similar, with AE with more EoE-experience recommending more often MAC
376 and intubation than less EoE-experienced AG.

377

378 *Endoscopic Management*

379 Since managing EoE related EFI involves several unique aspects of clinical
380 judgement and endoscopic skill, our survey results related to procurement of biopsies,
381 method of disimpaction, and role of dilation were illuminating. First, a minority of
382 endoscopists suggested taking biopsies in patients without known EoE in case of EFI.
383 However, the great majority of EoE-experienced endoscopists and PE recommended
384 always obtaining biopsies at the index endoscopy in case of EFI. Since 10-20% of EoE
385 patients have a normal mucosa¹¹ and a significant intra- and interobserver reliability
386 exists in describing endoscopic findings,¹² we strongly encourage that biopsies should
387 be taken at the index endoscopy even in the presence of normal endoscopic findings. A
388 Danish study demonstrated that there is a considerable increase in EoE detection after
389 implementation of a biopsy protocol in every patient with dysphagia even in the absence
390 of visible mucosal lesions.¹³ Furthermore, Chang et al¹⁴ showed that more than 50% of
391 patients are lost to follow-up after EFI and that patients never biopsied had the lowest
392 rate of adequate follow-up within a single-center American cohort. Due to the fact that
393 EoE is a strong predictor of recurrent EFI,^{4, 14} it is crucial that these patients are not
394 missed and instead, diagnosed early to prevent complications of untreated disease. This
395 message may be gradually impacting practice with regional differences, as a recent
396 survey among German gastroenterologists indicated that more than 75% of respondents
397 take biopsies in patients with dysphagia in the absence of suggestive endoscopic
398 findings.¹⁵ Additionally, an assessment of the management of EoE within Europe showed
399 that more PE compared to AE take biopsies in patients with dysphagia without

400 endoscopic lesions. However, the rate of obtaining biopsies in case of EFI was rather low
401 and not different in PE and AE in this study.¹⁶

402 Despite published data on the safety and efficiency of the push technique in
403 adults^{17, 18} and in children,¹⁹ only half of endoscopists suggested to gently push the bolus
404 down the stomach initially. This may be related to the publication of the ASGE that
405 advocated against this technique in their latest statement.⁹ However, nearly the entire
406 population in these studies had a Schatzki ring or a peptic stricture as cause of the EFI
407 and not EoE.^{17, 18} Importantly, most PE advised against the push technique.

408

409 *Post-endoscopic Management*

410 The majority of respondents suggested a first appointment within one month of
411 the EFI. This makes sense to prevent loss of follow-up and initiate medical treatment
412 and is particularly important in patients without a primary care provider within the
413 health-care system.¹⁴ Patients without appropriate follow-up may suffer persistent
414 symptom burden and are at risk for subsequent EFI.²⁰ Conversely, treatment with
415 topical steroids has been shown to decrease the chance of recurrent EFI.²¹ Furthermore,
416 since counseling and shared decision making are inappropriately low in EoE,²² the high
417 agreement in our survey respondents advocating for routine follow-up after EFI to
418 discuss and explain the disease is a step in the right direction.

419 Surprisingly, only a quarter of the respondents advised repeat endoscopy off
420 Proton pump inhibitors (PPIs) despite having started a therapy with PPIs without
421 having obtained biopsies during the index endoscopy. PPIs are, in addition to
422 swallowed topical corticosteroids (STC) and elimination diets, considered as first line
423 therapy.²³⁻²⁵ A histologic response to PPI is no longer used as a diagnostic criterion.
424 However, if a patient has a repeat endoscopy on PPI therapy and biopsies are normal, it

425 would difficult to determine if the patient has treated EoE, GERD or both as underlying
426 cause.²⁶ To that point, a recent study demonstrated that a therapy with PPI after EFI
427 may mask EoE at follow-up.²⁷

428 Our study has several strengths and also some limitations. This is the first survey
429 to evaluate the ideal management practice of esophageal food bolus impaction in EoE
430 patients. Results of this survey may serve as an early guidance for later standardization
431 of EFI management. One limitation was that we were not able to accurately determine
432 the response rate because the survey was not sent directly to the participants but
433 distributed by several societies from the US and Europe. Another limitation was that we
434 intentionally sought the opinions of endoscopists with a range of experience, likely
435 contributing to the heterogeneity. Thus, where we found consensus does not necessarily
436 reflect the opinion of experts. Although we asked how to optimally treat EFI, we can not
437 exclude that the answers were influenced by common practices and legal regulations
438 (for example administration of sedatives). However, since we explicitly did not ask how
439 EFI was managed in real practice, which is more influenced by laws and customs, we
440 could minimize this limitation. Nevertheless, the answers of the endoscopists reflects
441 their opinion which are based on experience and influenced by legal regulations.

442 In conclusion, our findings demonstrate that although endoscopists agreed on
443 multiple key points with recommendations, there was variation in practice
444 recommendations based on pediatric versus adult specialty and between more and less
445 experienced EoE endoscopists.¹⁶ While there was good agreement on preclinical and
446 pre-endoscopy management, recommendations on the of type of sedation, management
447 during endoscopy and initiating of therapies after endoscopy differed considerably
448 among responders. This may in part reflect the lack of evidence for the best
449 management in EFI indicating that more studies on the management of EFI are needed.

450 Furthermore, the low rate of endoscopists recommending biopsies during the index
451 endoscopy indicates that guidance is needed to optimize the management of EFI.
452 Consensus practice guidelines for management of EFI could help reduce practice
453 variation for treatment of EFI in EoE patients.

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547 Figure Legends:

548

549 Figure 1A: Type of sedation in patients with EFI due to EoE: Recommendation according
550 to EoE-experience level of the responder

551 Figure 1B: Type of sedation in patients with EFI due to EoE: Recommendation according
552 to specialty (adults vs. pediatrics)

553 Figure 2A: Endotracheal intubation in patients with EFI due to EoE: Recommendation
554 according to EoE-experience level of the responder

555 Figure 2B: Endotracheal intubation in patients with EFI due to EoE: Recommendation
556 according to gastroenterology specialty

557 Figure 3: Post-endoscopy care in patients with EFI due to EoE

558 Figure 4: Management in case of spontaneous resolution of the EFI in the ER

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560 Table Legends:

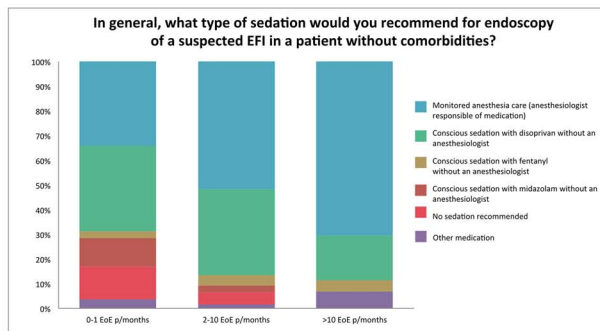
561 Table 1: Answers to the questionnaires of all respondents

562 Supplementary Table 1: Answers to the questionnaire stratified by EoE-experience level

563 Supplementary Table 2: Answers to the questionnaire stratified by specialty (adults vs.
564 pediatrics)

565 Supplementary Table 3: Answers to the questionnaire stratified by country of origin

A



B

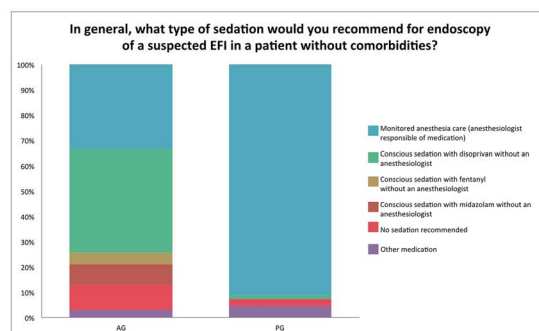
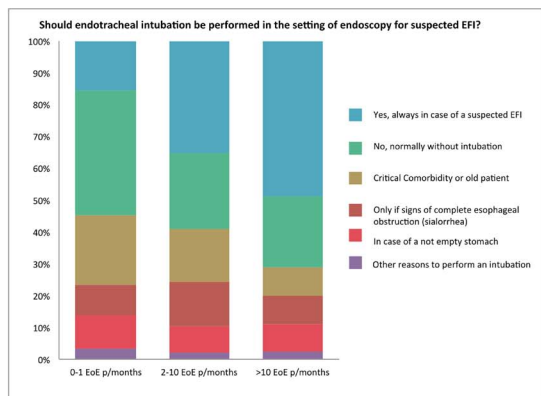


Fig. 1 (A) Type of sedation in patients with EFI due to EoE: recommendation according to EoE-experience level of the responder; (B) Type of sedation in patients with EFI due to EoE: recommendation according to specialty (adults vs. peditrics).

A



B

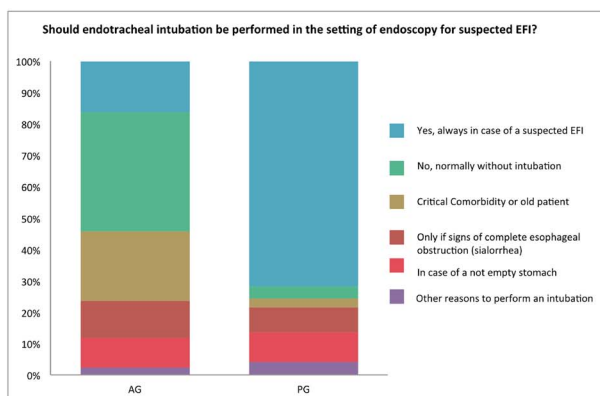


Fig. 2 (A) Endotracheal intubation in patients with EFI due to EoE: recommendation according to EoE-experience level of the responder; (B) Endotracheal intubation in patients with EFI due to EoE: recommendation according to gastroenterology specialty.

What type of follow-up should occur after an EFI (index or recurrent)?

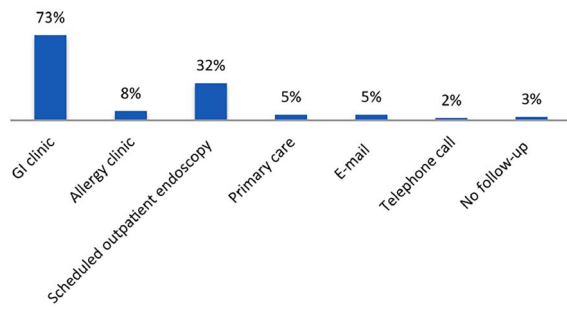


Fig. 3 Post-endoscopy care in patients with EFI due to EoE

In case of bolus that spontaneously passes in the ER during the present ER visit before endoscopy, what management do you recommend?

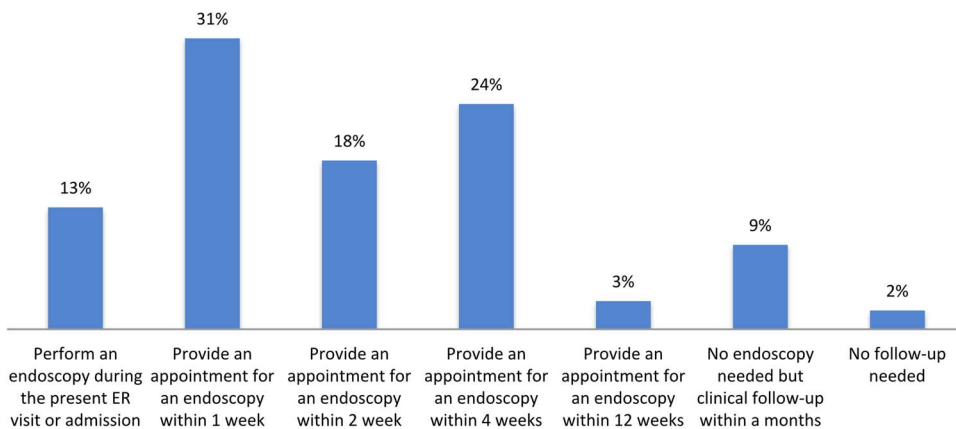


Fig. 4 Management in case of spontaneous resolution of the EFI in the ER.

Table 1 Answers to the questionnaires of all respondents

Participants		<i>n</i> = 308
Preclinical management		
If any, what maneuvers do you recommend to patients before they contact their physician?		
Wait and relax		
Never		162 (53%)
Sometimes		112 (36%)
Often		32 (10%)
Missing		2 (1%)
Try to vomit		
Never		258 (84%)
Sometimes		38 (12%)
Often		9 (3%)
Missing		3 (1%)
Drink water		
Never		65 (21%)
Sometimes		146 (47%)
Often		96 (31%)
Missing		1 (0%)
Taking a medication		
Never		263 (85%)
Sometimes		29 (9%)
Often		12 (4%)
Missing		4 (1%)
Other action to be taken		
Never		260 (84%)
Sometimes		30 (10%)
Often		13 (4%)
Missing		5 (2%)
None, they need to go directly to their gastroenterologist/emergency room department		
Never		33 (11%)
Sometimes		70 (23%)
Often		202 (66%)
Missing		3 (1%)
After what time frame should a patient without known EoE seek medical help if the esophageal food impaction has not resolved spontaneously (or with the above mentioned recommendations)?		
Within 10 minutes		17 (6%)
11–30 minutes		53 (17%)
31–59 minutes		75 (24%)
1–2 hour		125 (41%)
>2 hour		38 (12%)
After what time frame should a patient with known EoE seek medical help if the esophageal food impaction has not resolved spontaneously (or with the above mentioned recommendations)?		
Within 10 minutes		19 (6%)
11–30 minutes		71 (23%)
31–59 minutes		83 (27%)
1–2 hour		102 (33%)
>2 hour		33 (11%)

(Continued)

Table 1 Continued

Participants

n = 308

In-hospital management

Which specialist should be called initially by the 'Doctor on Duty at the ER' for a patient with suspected EFI?

ENT 17 (6%)
Gastroenterologist 280 (91%)
Other specialist 11 (4%)

In general, in a patient with a suspected food impaction when would you obtain blood analysis during initial evaluation?

In general not necessary 191 (62%)
In every patient with first time food impaction 50 (16%)
After a certain age of the patient 7 (2%)
In case of comorbidities of the patient 39 (13%)
Other reason to obtain blood analysis 17 (6%)
In every patient 39 (13%)

In general, in a patient with a suspected food impaction when would you obtain a gastrographin/water soluble contrast study?

In general not necessary 249 (81%)
In every patient with first time food impaction 24 (8%)
After a certain age of the patient 3 (1%)
In case of comorbidities of the patient 7 (2%)
Other reason to obtain a gastrographin/water soluble contrast study 24 (8%)
In every patient 8 (3%)

In general, in a patient with a suspected food impaction when would you obtain a CT scan?

In general not necessary 238 (77%)
In every patient with first time food impaction 1 (0%)
After a certain age of the patient 6 (2%)
In case of comorbidities of the patient 7 (2%)
Other reason to obtain a CT scan 64 (21%)
In every patient 2 (1%)

In general, in a patient with a suspected food impaction when would you obtain an ECG?

In general not necessary 198 (64%)
In every patient with first time food impaction 21 (7%)
After a certain age of the patient 11 (4%)
In case of comorbidities of the patient 45 (15%)
Other reason to obtain an ECG 17 (6%)
In every patient 26 (8%)

In general, in a patient with a suspected food impaction when would you obtain a plain chest X-ray?

In general not necessary 202 (66%)
In every patient with first time food impaction 30 (10%)
After a certain age of the patient 2 (1%)
In case of comorbidities of the patient 14 (5%)
Other reason to obtain a plain chest X-ray 48 (16%)
In every patient 22 (7%)

(Continued)

Table 1 Continued

Participants	n = 308
Which measures would you recommend for a patient with EFI at the ER?	
Patients must be kept fasting and establish an i.v. line	284 (92%)
Try to induce vomiting	16 (5%)
Drinking of water	130 (42%)
Administer a medication* 1	86 (28%)
Other measures	18 (6%)
Should the 'GI on Duty' always perform an endoscopy when being called to a patient with suspected EFI?	
Yes, an endoscopy should in general always be performed	261 (85%)
No, in case of a not empty stomach an endoscopy should be postponed	24 (8%)
No, in case of comorbidities, the endoscopy should not be performed	3 (1%)
No, other reason to not perform the endoscopy	18 (6%)
When should the 'GI on Duty' perform the endoscopy during regular business hours?	
As soon as possible	191 (62%)
Wait until the stomach is empty, about 6 hours after the last meal	38 (12%)
Within the first 6 hours of the food impaction	44 (14%)
Within the first 12 hours of the food impaction	23 (7%)
Within the first 24 hours of the food impaction	7 (2%)
Endoscopy can wait 24 hours after the food impaction	2 (1%)
When should the 'GI on Duty' perform the endoscopy outside business hours (e.g. after hours)?	
As soon as possible	163 (53%)
Wait until the stomach is empty, about 6 hours after the last meal	35 (11%)
Within the first 6 hours of the food impaction	50 (16%)
Within the first 12 hours of the food impaction	37 (12%)
Within the first 24 hours of the food impaction	11 (4%)
Endoscopy can wait 24 hours after the food impaction	6 (2%)
Next working day (which can be after weekend)	3 (1%)
In general, what type of sedation would you recommend for endoscopy of a suspected EFI in a patient without comorbidities?	
Conscious sedation with disoprivan without an anesthesiologist	98 (32%)
Conscious sedation with midazolam without an anesthesiologist	19 (6%)
Conscious sedation with midazolam with fentanyl without an anesthesiologist	11 (4%)
other medication	10 (3%)
Monitored anesthesia care (anesthesiologist responsible of medication)	141 (46%)
No sedation recommended	26 (8%)

(Continued)

Table 1 Continued

Participants		<i>n</i> = 308
Should endotracheal intubation (by an anesthesiologist or anesthesia provider) be performed in the setting of endoscopy for suspected EFI?	Yes, always in case of a suspected EFI	100 (32%)
	Only if signs of complete esophageal obstruction (sialorrhea) in case of a not empty stomach	34 (11%)
	Critical Comorbidity or old patient	66 (21%)
	No, normally without intubation	113 (37%)
Do you recommend routine use of an overtube for endoscopic management of esophageal food impactions?	Other reasons to perform an intubation	10 (3%)
	No, normally not	273 (89%)
	Yes, but only in intubated patients	14 (5%)
	Yes, in all patients	18 (6%)
Do you recommend that esophageal biopsies be taken during an emergency endoscopy for EFI in a patient without having a diagnosis of EoE?	Yes, generally always	133 (43%)
	Only when EoE is suspected in endoscopy	36 (12%)
	Only when there is not much mucosal injury	45 (15%)
	Only when the impaction is easy to resolve	25 (8%)
Do you recommend that esophageal biopsies be taken during an emergency endoscopy for EFI in a patient with an established diagnosis of EoE?	No, usually not during an emergency endoscopy	95 (31%)
	Yes, generally always	94 (31%)
	Only when active EoE is suspected	23 (7%)
	Only when there is not much mucosal injury	24 (8%)
Would you recommend that the endoscopist performs a dilation during an emergency endoscopy for a bolus removal in a patient with suspected (but not established) EoE?	Only when the impaction is easy to resolve	20 (6%)
	No, usually not during an emergency endoscopy	154 (50%)
	Yes, generally always (also if no obvious stricture is present)	2 (1%)
	Yes, but only if an obvious stricture is present and there are no signs of inflammation or esophageal injury from the impaction	75 (24%)
Should the endoscopist perform a dilation during an emergency endoscopy for a bolus removal in a patient with established EoE?	Yes, but only if an obvious stricture is present regardless of inflammation	16 (5%)
	No, never	215 (70%)
	Yes, generally always (also if no obvious stricture is present)	1 (0%)
	Yes, but only if an obvious stricture is present and there are no signs of inflammation or esophageal injury from the impaction	89 (29%)
Should the endoscopist perform a dilation during an emergency endoscopy for a bolus removal in a patient with established EoE?	Yes, but only if an obvious stricture is present regardless of inflammation	17 (6%)
	No, never	200 (65%)

(Continued)

Table 1 Continued

Participants		n = 308
Upon entering the esophagus with a food bolus do you think attempting to push the food bolus into the stomach is feasible?	Pushing gently the bolus down to the stomach should always be tried Sometimes Never. You should not push the bolus blindly	132 (43%) 126 (41%) 47 (15%)
Which of the following devices for pushing or for extraction of an impacted bolus do you use?	None Roth Net Retrievers Standard Biopsy Forceps Tripod Forceps Mucosectomy Cap Polypectomy Snare Rat-tooth Forceps Alligator Forceps	28 (9%) 189 (61%) 105 (34%) 143 (46%) 87 (28%) 152 (49%) 106 (34%) 153 (50%)
When would you recommend a routine patient be discharged after successful removal of an impacted food bolus?	As soon as he/she has gained consciousness and tolerating some oral intake—i.e. routine care after an endoscopy After a perforation or aspiration is excluded by X-ray or CT-scan After an uneventful 24-hour hospital stay	232 (75%) 21 (7%) 52 (17%)
If esophageal biopsies are obtained for suspected EoE at the time of endoscopy for an acute food impaction, should a treatment be started/prescribed once daily) immediately?	No, wait until biopsies have returned Yes, PPI in standard dose (e.g. esomeprazole 40 mg once daily) Yes, PPI in double dose (e.g. esomeprazole 40 mg twice daily) Yes, swallowed topical corticosteroids Yes, food elimination diet Yes, with other medicines	130 (42%) 94 (31%) 83 (27%) 11 (4%) 5 (2%) 3 (1%)
If esophageal biopsies were not obtained at the time of endoscopy for an acute food impaction, should a treatment be started/prescribed once daily) immediately?	No, the procedure should be repeated for biopsies Yes, PPI in standard dose (e.g. esomeprazole 40 mg once daily) Yes, PPI in double dose (e.g. esomeprazole 40 mg twice daily) Yes, swallowed topical corticosteroids Yes, food elimination diet Yes, with other medicines	210 (68%) 57 (19%) 46 (15%) 1 (0%) 1 (0%) 2 (1%)
Imagine a patient who had a recent food impaction with typical endoscopic findings for an EoE (Edema, Rings, Exsudates, Furrows and/or Strictures). No esophageal biopsies were performed at the time of the impaction and he/she was immediately started on PPI afterwards. What would you recommend for the timing of his/her next endoscopy?	Repeat endoscopy as soon as possible (on PPI) Stop PPI and repeat endoscopy in 2–4 weeks Stop PPI and repeat endoscopy in 5–8 weeks Stop PPI and repeat endoscopy in > 8 weeks Stop PPI and no surveillance endoscopy needed Continue PPI and repeat endoscopy in 2–4 weeks Continue PPI and repeat endoscopy in 5–8 weeks	84 (27%) 56 (18%) 21 (7%) 6 (2%) 1 (0%) 38 (12%) 52 (17%)

(Continued)

Table 1 Continued

Participants		<i>n</i> = 308
Imagine a patient who had a recent food impaction. The endoscopist in the ER did report a normal esophagus during endoscopy for food impaction. However, histology showed 30 Eos/HPF in the distal and 0 Eos/HPF in the proximal esophagus. You are now consulted on your opinion regarding best management of this patient, who did not receive any treatment so far. What would you suggest:	Continue PPI and repeat endoscopy in >8 weeks	45 (15%)
	Other recommendation	4 (1%)
As a general rule, should a repeat endoscopy be done after an EFI?	no treatment and no further procedures as long the patient will not have any future events of dysphagia or food impaction	11 (4%)
	no treatment at the current stage, schedule consultation	10 (3%)
	no treatment at the current stage, schedule consultation & endoscopy/biopsies (off treatment)	29 (9%)
	promptly initiate PPI, schedule consultation but no endoscopy	64 (21%)
	promptly initiate PPI, schedule consultation and endoscopy/biopsies (on PPI)	161 (52%)
	promptly initiate swallowed topical corticosteroids, schedule consultation but no endoscopy	7 (2%)
	promptly initiate swallowed topical corticosteroids, schedule consultation and endoscopy/biopsies (on swallowed topical corticosteroids)	25 (8%)
	Yes, always	144 (47%)
	Only if stricture/narrowing was seen	18 (6%)
	Only if diagnostic biopsies were not taken during the emergency endoscopy	95 (31%)
What type of follow-up should occur after an EFI (index or recurrent)?	Only after initiating treatment in order to monitor the response to therapy	25 (8%)
	Only if symptoms reappear	13 (4%)
	No, not necessary	11 (4%)
	GI clinic appointment	225 (73%)
	Allergy clinic appointment	24 (8%)
	Scheduled outpatient endoscopy	98 (32%)
	Primary care appointment	15 (5%)
	A mailed letter from GI	16 (5%)
	Telephone call from the ER	6 (2%)
	No follow-up is recommended	10 (3%)
When should a first follow-up be done?	Not necessary	22 (7%)
	Within 1 week after bolus removal	60 (19%)
	Within 1 month after bolus removal	215 (70%)
	Within 1 year after bolus removal	6 (2%)

(Continued)

Table 1 Continued

Participants	n = 308
In case of bolus that spontaneously passes in the ER during the present ER visit before endoscopy (in a patient who has never had an or admission endoscopy), what management do you recommend?	<p>Perform an endoscopy during the present ER visit or admission 40 (13%)</p> <p>Provide an appointment for an endoscopy within 1 week 95 (31%)</p> <p>Provide an appointment for an endoscopy within 2 weeks 54 (18%)</p> <p>Provide an appointment for an endoscopy within 4 weeks 74 (24%)</p> <p>Provide an appointment for an endoscopy within 12 weeks 10 (3%)</p> <p>No endoscopy needed but clinical follow-up within a month 29 (9%)</p> <p>No follow-up needed 5 (2%)</p>

*1: Glucagon 16%, Calcium-channel blockers 4%, Inhaled beta-agonist 2%, Nitrates 8%, Butylscopolamines 6%, Benzodiazepine 2%, Proton pump inhibitor intravenous 2%, swallowed topical corticosteroids 1%, Opioids 1%, Erythromycine <1%, Metoclopramide <1%, Prednisolone intravenous <1%