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Research Article

Routine Oesophageal Biopsies in the Investigation of Dysphagia: Are they Cost Effective?

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Abstract

Background: Oesophageal biopsies in patients presenting with dysphagia are taken to exclude eosinophilic oesophagitis (EO). We have attempted to demonstrate that taking routine biopsies is not cost effective for all patients with a new diagnosis of dysphagia. In preference, targeted biopsies should be taken for those patients with a suggestive history or signs visible endoscopically.

Introduction: Eosinophilic oesophagitis (EO) is an immunogenic-antigen mediated disease of the oesophagus, histologically defined by over 15 eosinophil counts seen in a high-power microscopic field, without gastro-oesophageal reflux disease. It causes symptoms including dysphagia, regurgitation and food bolus impaction. Patients often have a personal or family history of atopy. Endoscopically, mucosal furrowing and prominent concentric rings are sometimes seen. Oesophageal biopsies are necessary to diagnose EO. We evaluated the results of routine oesophageal biopsies to investigate patients with dysphagia.

Methods: We looked at 160 consecutive patients who were referred to East Sussex Healthcare NHS Trust with a new diagnosis of dysphagia over a 3 month period. Data was collected from our endoscopy reporting tool (EndoBase) and patient notes. 23 of these patients had an endoscopic diagnosis of Barrett's oesophagus or oesophageal cancer and were excluded as biopsies were not taken for eosinophilic oesophagitis.

Results: 5 out of 137 patients had a biopsy result consistent with EO, representing 3.6% of patients. 61.3% were normal and 35.1% showed reflux related inflammation. All patients with EO had either a history of food bolus impaction or repeated dysphagia episodes. Two patients had a personal or family history of asthma/eczema. The cost of biopsies at two different levels in the oesophagus was £46.68 per patient. £1279 was spent to diagnose one case of EO.

Conclusion: A selective strategy for taking oesophageal biopsies would be more cost effective and free up histopathology time. Restricting biopsies to those patients with a history of episodic food bolus obstruction, a family or past history of asthma/atopy, or endoscopic signs such as mucosal furrowing and prominent concentric rings, merits further assessment.

Keywords: *Dysphagia; Eosinophilic Oesophagitis; Cost Effectiveness; Oesophagus; Biopsy*

Abbreviation

EO: Eosinophilic Oesophagitis

Introduction

Eosinophilic oesophagitis is an immunologically mediated disease that gives rise to symptoms of dysphagia, food bolus obstruction, chest pain and gastroesophageal reflux, particularly reflux that does not respond to proton pump inhibitors [1-3]. There is a strong association with allergic disorders such as asthma, atopic dermatitis and food allergies, with estimates ranging from 28 to 86 percent of

adults with eosinophilic oesophagitis having another allergic disease such as asthma, allergic rhinitis and atopic dermatitis [4-7]. Males are affected there times more commonly than females [8], with peak incidence in childhood and in the third and fourth decades. The condition was first described in 1993 [9]. Dysphagia to solid foods is the most common symptom [1,10,11] and there is a high prevalence of food impaction in more than 50% of cases [2,12,13]. The diagnosis of eosinophilic oesophagitis is based upon symptoms and endoscopically a variety of features have been described in the oesophagus in patients with eosinophilic oesophagitis. These include concentric rings, linear furrows and strictures [14-16]. The diagnosis is established histologically with biopsies taken from the upper and lower oesophagus. Typically, more than 15 eosinophils per high powered field are required to make a diagnosis [17]. Treatments include dietary modifications, pharmacological treatments with proton pump inhibitors and topical glucocorticoid therapy and endoscopic dilatation for strictures [13,18,19]. The incidence of eosinophilic oesophagitis appears to be increasing [4,20,21]. Some of this increase may be due to increased recognition of the condition such that biopsies are being taken more and more in patients attending endoscopy departments with a history of dysphagia. In our institution the majority of patients presenting with dysphagia who have normal endoscopic appearances have biopsies taken from the proximal and distal oesophagus to assess for the presence of eosinophilic oesophagitis. This is a growing trend we have observed in recent years. The purpose of this study was to try and establish the diagnostic yield of routine biopsies in patients with dysphagia and to get an idea if this is a cost effective approach to evaluating patients for eosinophilic oesophagitis.

Materials and Methods

The case notes of 160 consecutive adult patients referred for an upper gastrointestinal endoscopy at East Sussex Hospitals NHS Trust because of symptoms of dysphagia over a 3 month period from July 2016 to September 2016 were reviewed retrospectively. The endoscopy reports on the reporting tool Endobase were analysed as were the histopathology reports from patients' biopsies. Patients were classified as having eosinophilic oesophagitis if the proximal oesophageal biopsy samples contained more than 15 eosinophils per high powered field. The case notes were reviewed for a more detailed account of patients' background medical history. The endoscopies were carried out by a variety of clinical staff including consultants, specialist registrars and endoscopy nurses.

Results and Discussion

The records of 160 consecutive endoscopy patients referred for dysphagia were assessed. The age range was 23 - 94 years of age, median age 69. Male: female ratio was 1:1.24. 23 of the 160 patients had an endoscopic suspicion of Barrett's oesophagus or oesophageal malignancy. As such, biopsies were taken to diagnose Barrett's oesophagus or a tumour and no samples were taken to assess for the presence of eosinophilic oesophagitis. These 23 patients were excluded from further analysis. Of the remaining 137 patients, the endoscopic findings are detailed in figure 1.

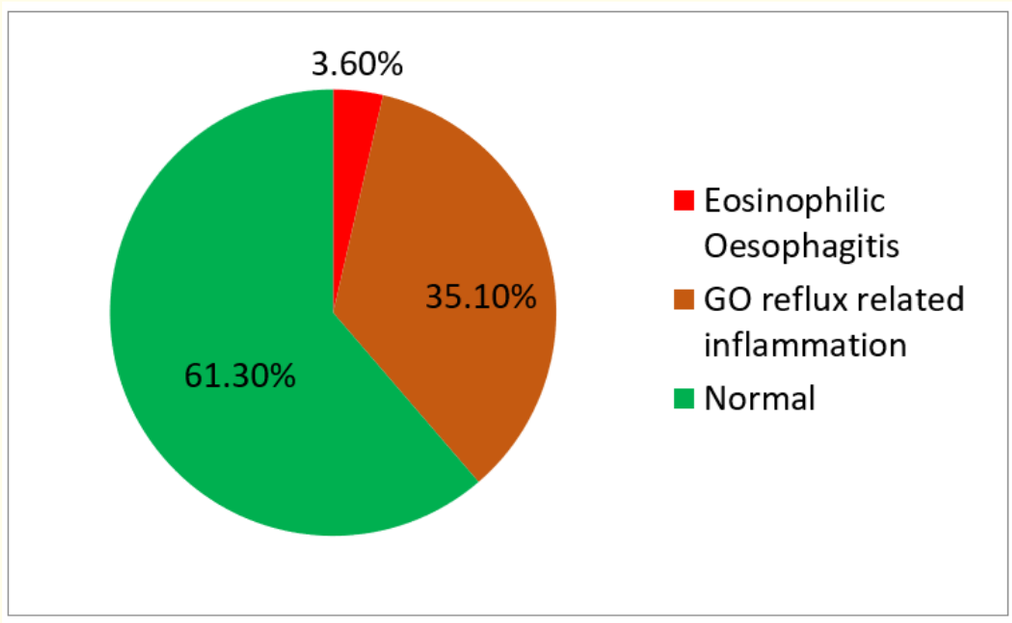

Figure 1: *Biopsy findings.*

61.3% of endoscopies were normal. 35.1% showed changes of gastroesophageal reflux. All 137 patients had biopsies taken from the proximal and distal oesophagus. 5 of these (3.6%) had characteristic findings of eosinophilic oesophagitis, with greater than 15 eosinophils per high powered field. These 5 patients all had a history of food bolus obstruction or recurrent dysphagia to solid foods. Furthermore two of these five patients had a history of asthma or eczema. Three of these five patients were males aged 35 - 51. Two of these five had minor oesophageal strictures and prominent mucosal furrows were reported in these two cases as well. One further case of eosinophilic oesophagitis had linear furrowing. The cost of taking biopsies from the upper and lower oesophagus in our institution is £46.68 per patient. A total of £6395.16 was spent on the samples in the total patient population. This meant that the histopathology cost of each case of eosinophilic oesophagitis was £1279.

Eosinophilic oesophagitis should be considered as a diagnosis in patients with a history of food bolus impaction and recurrent dysphagia to solid foods. A history of asthma or atopy should prompt the physician to consider the diagnosis more strongly. It is beyond the scope of this article to discuss the assessment eosinophilic oesophagitis in the paediatric population. The initial assessment will be based upon suggestive symptoms as listed above. The diagnostic test is an upper gastrointestinal endoscopy with oesophageal biopsies. A variety of endoscopic appearances are described in association with eosinophilic oesophagitis including circular concentric rings, linear furrows, strictures and white papules. A meta-analysis [22] showed that these appearances were present both in controls and in patients with eosinophilic oesophagitis, but that the individual features lacked sensitivity for a diagnosis of eosinophilic oesophagitis, ranging from 15 to 48 percent [22]. The gold standard investigation remains histology to confirm the presence of excessive eosinophils. The presence of eosinophils in the distal oesophagus can reflect reflux disease but eosinophils in high numbers in biopsies from the proximal oesophagus are strongly in favour of eosinophilic oesophagitis. Biopsies should be taken from the distal and mid or upper oesophagus [23]. The more biopsies that are taken increases the sensitivity [24], the majority of our patients had two samples taken at each level. Arguably increasing this number to three biopsies from each site would increase the sensitivity from 84 to 97 percent [24] so it is possible that we could have missed some cases of eosinophilic oesophagitis in our patient population.

Due to the large numbers of patients being referred for an endoscopy to evaluate dysphagia, and in the light of increasing awareness of eosinophilic oesophagitis it is not surprising that oesophageal biopsies are being taken as a matter of routine in the assessment of patients with dysphagia. This has been the case in our unit. However, this places an extra burden upon histopathology in terms of manpower and in terms of cost. We undertook this study to assess the cost effectiveness of such as strategy by examining how many cases of eosinophilic oesophagitis were diagnosed.

Our data from a small series over 3 months would suggest that taking biopsies from every patient with dysphagia results in a large quantity of normal biopsy samples being analyzed and at a cost of £1279 per each case diagnosed. Cost savings could be made if we were to rationalize our approach to routine biopsies in patients with dysphagia. It is known that eosinophilic oesophagitis is present in patients with normal endoscopic appearances [25] so relying on mucosal appearances alone would result in missed diagnoses. Of the 5 patients in our series who had eosinophilic oesophagitis all had a history of food bolus obstruction or repeated dysphagia to solid foods. Furthermore, 2 of these 5 had asthma or a history of atopy, in keeping with the known associations with eosinophilic oesophagitis. Taking into consideration the precise dysphagia history and co-morbidities such as asthma or atopy would help narrow down those patients whose dysphagia could be related to eosinophilic oesophagitis as opposed to other causes such as gastro-oesophageal reflux or oesophageal dysmotility. Such an approach would also reduce the possibility of missing the diagnosis in patients with a normal endoscopy but who had these 'risk factors'. This in turn would lead to a reduction in the number of patients in whom biopsies are taken to assess for eosinophilic oesophagitis.

It would seem reasonable to propose to take biopsies in the following:

a) Patients with food bolus obstruction or repeated dysphagia to solid foods
b) Dysphagia with a history of asthma, allergic dermatitis or atopy
c) Endoscopic findings of liner furrows, concentric rings or strictures
d) Dysphagia in men in their third or fourth decades.

The advantages as we see it would include significant reductions in costs and in histopathology time spent analyzing the biopsies. This as far as we know is the first study to look at the practice of biopsy-ing every patient with dysphagia and questioning the cost effectiveness of such a strategy. Our patient numbers are small and due to the retrospective nature of the study and potential variability in reporting practices we cannot accurately state how many of our normal biopsy specimens were taken from people with endoscopic features of linear furrows and concentric rings. If we had this information we could make a more accurate assessment of the likely cost savings by adopting a limited biopsy approach as opposed to taking biopsies from every patient. This is something that we can address prospectively and in a larger patient cohort.

Conclusion

Eosinophilic oesophagitis is a cause of dysphagia diagnosed by a suggestive history, endoscopic appearances and histology. Taking biopsies from every patient with dysphagia is costly and time consuming. By adopting a more conservative approach and restricting biopsies to patients with endoscopic abnormalities, a history of food bolus impaction and especially if combined with a history of asthma or atopy we believe that significant cost savings could be made.

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Conflict of Interest

No conflicts of interest.

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