GUIDELINE REVIEW

Management of benign oesophageal strictures

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ABSTRACT

Benign oesophageal strictures are an important gastrointestinal condition that can cause substantial morbidity. There are many different aetiologies and each case needs careful evaluation and individualised treatment. Management usually involves targeting therapy to the underlying cause, but oesophageal dilatation is an important part of the algorithm. The recent British Society of Gastroenterology guidelines provide advice on the use of dilatation for benign strictures and cover patient preparation, the dilatation procedure and disease-specific considerations. This article provides a summary of the key messages from the guidelines and applies them to routine clinical practice. It also includes practical advice on the clinical assessment, investigation and management of benign oesophageal strictures and gives an approach to the management of refractory strictures. Areas where evidence is sparse and further research is needed are highlighted.

INTRODUCTION

Benign oesophageal strictures are a common presentation with an important differential diagnosis, including malignancy (table 1).[1] Management usually involves treatment of the underlying cause accompanied by dilatation of the strictured segment. In 2018 Sami and colleagues published the updated British Society of Gastroenterology (BSG) guidelines on oesophageal dilatation in clinical practice.[2] This article provides a summary of the key recommendations of the guidelines. We discuss their implementation in routine clinical practice (table 2) and highlight areas where evidence is weak and management remains challenging (box 1).

THE GUIDELINES IN CLINICAL PRACTICE

Clinical assessment and general management

Patients with benign oesophageal strictures typically present with dysphagia and weight loss along with symptoms relating to the underlying aetiology. Urgent investigation is required but a careful history should be taken to assess for underlying causes, relevant medications and severity of symptoms. There are several clinical scores that can be used to define the severity of dysphagia and incorporating a simple score (example below) into clinical practice permits an objective assessment before and after intervention and provides useful data for clinical audit.[3–5]

A nutrition assessment should also be performed at the outset to guide the timing of investigations and interventions. The Malnutrition Universal Screening Tool (MUST) can be used to quantify the risk of malnutrition and where there is a concern, dietetic review and nutritional support should be prioritised.[6]

Dysphagia score (from Ogilvie *et al*[5])
0=able to eat normal diet
1=able to swallow some solid foods
2=able to swallow only semi solid foods
3=able to swallow liquids only
4=unable to swallow anything

Upper gastrointestinal endoscopy is the first-line investigation for dysphagia, though contrast radiology should be considered where there is a suspicion of a very high stricture, pharyngeal abnormality or complex anatomy. All guidelines stress the need to biopsy strictures to exclude malignancy before dilatation and, where appropriate, the background oesophageal mucosa from at least two sites to rule out eosinophilic oesophagitis.[7 8] The yield of targeted biopsies to exclude malignancy approaches 100% if six biopsies are taken but, where doubt persists, biopsies should be repeated even if this adds a small delay to interventions.[9]

It is important to note the following endoscopic features of a stricture carefully: distance from incisors to the proximal edge, length, diameter and ability to traverse the stricture with the endoscope (noting the diameter of the endoscope in

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Table 1 Causes of benign oesophageal strictures

Intrinsic oesophageal disorders	Iatrogenic or accidental
Peptic oesophagitis	Postsurgical: anastomotic*
Eosinophilic oesophagitis	Postradiation therapy*
Miscellaneous disorders of the squamous epithelium, eg, scleroderma, epidermolysis bullosa dystrophica, pemphigus and pemphigoid, lichen planus	Endoscopic therapy ► Postendoscopic resection: EMR/ESD* ► RFA/PDT ► Variceal band ligation
Motility disorders, eg, achalasia	Long-term nasogastric feeding tubes
Rings and webs, eg, Schatzki's ring	Caustic ingestion*

*Stricture more likely to become refractory.[27]
EMR, endoscopic mucosal resection; ESD, endoscopic submucosal dissection; PDT, photodynamic therapy; RFA, radiofrequency ablation.

use). The presence of ulceration, stricture complexity (a simple guide is whether the distal end of the stricture can be visualised from above) and any other abnormalities in the remaining oesophagus should be recorded along with photodocumentation. Features of eosinophilic oesophagitis (exudates, rings, oedema, furrows and strictures (EREFS)) should be noted but are not reliable and should not replace multiple oesophageal biopsies.[8]

Medical therapy must be maximised to control oesophageal inflammation. This might involve the withdrawal of medications such as non-steroidal anti-inflammatory drugs or bisphosphonates and optimisation of proton pump inhibitor therapy. In eosinophilic oesophagitis, medical therapy should be commenced ahead of or in parallel with stricture dilatation. Subsequently, the goals of treatment and dilatation should be discussed with and tailored to the individual's preferences and circumstances.[10]

Endoscopic dilatation

The BSG guidelines provide a useful algorithm for a stricture dilatation checklist and it may be helpful for departments to consider employing a version of this in their management protocols.[2]

Dilatations should be performed by an experienced operator who performs sufficient numbers to maintain their skills, though the optimum number required remains unknown. Whilst performing dilatation is not usually a technically demanding procedure, decisions about follow-up and need for fluoroscopy, knowledge of the underlying disease, management of complications and when a stricture is refractory all benefit from considerable clinical experience. Thus, it seems sensible that units should organise dilatations onto lists run by small numbers of clinicians who take a strong interest in the management of these patients.

Patients should be offered intravenous sedation with a benzodiazepine and an opioid analgesic as a minimum

Table 2 Service requirements for oesophageal dilatation

Service requirement	Details	Option
The endoscopy unit must have the ability to offer conscious sedation		
The endoscopy unit can offer GA or propofol sedation for selected cases		Agreed link with a referral centre
The endoscopy unit has ready access to surgical expertise		Agreed link with a referral centre
The endoscopy unit has ready access to fluoroscopy	Discussion with clinician experienced in fluoroscopic procedures to decide cases appropriate for this	Agreed link with a referral centre
Procedures to be performed by clinicians experienced in managing oesophageal strictures	Consider limiting to reduced numbers of endoscopists on dedicated lists	
Arrangements for clinical audit	Success rates, timeliness of procedure, complications—data for unit and individual endoscopists	
Appropriate protocols	Recovery and discharge protocol including recognition and management of complications; written discharge information for patient including on call contact details	
Access to repeat procedures within 1–2 weeks	Endoscopist to make necessary referral after procedure Patient should ideally have next appointment on discharge from hospital	
Appropriate management of complications with rapid access to CT scanning and surgical expertise where required	To be included in recovery/discharge protocol	Access to surgical and further endoscopic expertise can be via an agreed link with a referral centre
Management strategies in place for refractory strictures		Agreed link with a referral centre

Box 1 Areas of controversy and in need of further work or research

- Learning curve, specific skills needed and optimum number of dilatations required to maintain skills.
- A standard DOPS and assessment criteria for trainees.
- Optimal interval between dilatations and optimal target stricture diameter.
- Optimal starting diameter and increment in dilatation size per session, and optimal duration of balloon inflation.
- Greater detail of the role of intralesional steroids in preventing stricture recurrence.
- Predictors of refractory strictures (to allow earlier intervention).
- Improvement in understanding of management strategies of refractory strictures.

DOPS, direct observation of procedural skills.

due to the discomfort of the procedure, which means that these procedures should only be performed in units capable of supporting this. Propofol sedation or general anaesthetic are valid alternatives, but access to such lists can be limited and if offered to all patients could delay access to appropriate treatment, potentially compromising outcomes. One option to facilitate this might be to establish access to appropriately funded anaesthetist supported lists via local or regional networks.

Use of fluoroscopy to assist stricture dilatation permits accurate assessment of stricture anatomy, confirmation that the guidewire is correctly positioned and that the full length of the stricture has been dilated. If perforation is suspected, contrast can be injected to confirm and allow immediate treatment. However, access to such lists can be limited and specialist training is required. The reorganisation of endoscopy services to accommodate greater access to fluoroscopy for oesophageal dilatation might, if not planned carefully, result in delays for other patients requiring fluoroscopy such as luminal stenting or ERCP. Conversely, in the hands of experienced operators, it is possible to safely dilate most benign strictures without fluoroscopic assistance. Pragmatically fluoroscopy should be considered for patients with:

1. Long and/or tortuous strictures where the distal end cannot be visualised and/or a guidewire will not pass easily.
2. Proximal pharyngo-oesophageal strictures.
3. Complex postsurgical or abnormal anatomy.

The guidelines recommend that units must have an agreed protocol to follow in case of perforation with clear identification of a qualified surgeon (on or off-site) to help manage this. This means that centres where upper gastrointestinal or thoracic surgeons are not resident must have an agreed protocol with their nearest referral centre to manage such cases and transfer when appropriate.

Before the procedure, patients should consent for possible complications, including failure, bleeding, chest pain, perforation and aspiration. Chest pain is common after dilatation of strictures associated with eosinophilic oesophagitis or after bougie use, so patients should be warned of this. The risk of perforation is low for simple strictures and less than the frequently quoted risk of 1%.[11] Oesophageal dilatation can be performed as a day case procedure and UK endoscopists should follow BSG guidelines for managing anticoagulant medications; oesophageal dilatation is classified as a 'high-risk' procedure for these purposes.[12]

Either a bougie or an oesophageal balloon can be used for dilatation, though guide-wire-based systems are recommended. Although there are no recent randomised trials, bougies and balloons appear to be equally effective and safe.[11 13] A novel 'bougie-cap' has been developed to enable direct vision bougienage, though initial data are limited.[14] There are many types of 'through-the-scope' endoscopic balloon dilator that typically provide dilatation in 1.0 or 1.5 mm increments with three sizes per balloon. Traditionally, each insufflation is for 1 min, though the optimal duration warrants further research. With through the scope balloons, it is important to reassess the mucosa after each dilatation; where there is minimal mucosal trauma, the next size of the balloon can be used, whereas if a significant injury is seen, it is advisable to stop and schedule a repeat examination.

Little evidence exists to support the choice of dilatation diameter though it is recommended to start conservatively (10–12 mm for tight strictures) and increase gradually over successive procedures depending on the degree of patient tolerance and mucosal trauma. The historic teaching of the 'rule of 3' was established for blind bougienage, in which sequential dilatation should be three measurements from the one where resistance was felt but is not applicable to balloon dilatation where direct visualisation should be used to guide balloon size.[15]

Likewise, there is no evidence-based target for the maximum diameter that is required; the guidelines recommend >15 mm but the greater priority is patient symptoms, which should be carefully evaluated before each procedure. The optimum diameter will vary according to patient size, stricture aetiology (higher diameters may be preferable for post-surgical strictures)[16] and location (narrower diameters for proximal strictures), so individualisation is paramount.

After dilatation, it is recommended that further procedures should be performed weekly or 2 weekly until the passage of a ≥15 mm dilator is achieved along with symptomatic improvement. Overall, one to three sessions are sufficient to relieve dysphagia in simple strictures with a maximum of five dilatations needed in >95% of patients.[17] This approach requires flexibility in the service and a focus on comfort during

the index procedure. It seems most appropriate that the decision and arrangements for further procedures should be taken by the endoscopist performing the dilatation so that patients can be aware of follow-up plans before they leave the department.

The guidelines recommend that patients should be monitored for at least 2 hours in recovery. Any concerns should prompt further investigations and admission. All patients should be able to swallow liquids before leaving the department and be provided with written advice on fluids, diet and medications and contact information for the on-call team should they experience chest pain, breathlessness or become unwell. Perforation is associated with high morbidity and mortality, which increases from 10% to up to 60% when detection is delayed.[18] Early recognition is, therefore, paramount to allow the prompt introduction of effective conservative management and the possibility of endoscopic therapy such as defect closure or placement of a covered stent.[19] Recently, the introduction of Esosponge opens a promising alternative endoscopic treatment of perforation.[20]

Refractory or complex strictures

A refractory stricture has been defined as an anatomic restriction that results in dysphagia in the absence of endoscopic evidence of inflammation that is due to an inability to achieve an oesophageal diameter of 14 mm over 5 sessions at 2 week intervals (refractory) or to maintain this diameter for 4 weeks (recurrent).[21] Although widely accepted, it should be understood that there is no evidence base in support of this.

In practice, a stricture should only be considered refractory once the patient has had sequential dilatations at short intervals and has optimised medical treatment for the underlying cause. Where ulceration or inflammation cannot be healed, further endoscopic measures to treat the stricture are less likely to succeed and alternative approaches, including surgical, may need to be considered. True refractory strictures are uncommon and may benefit from discussion at MDT meetings.

The simplest option is injection of steroid (usually 0.5 mL of 40 mg/mL triamcinolone injected into four quadrants). Two meta-analyses indicate that stricture recurrence rate is reduced after steroid injection without an increase in complications.[22 23] A recent randomised trial in patients with anastomotic strictures demonstrated significant benefit after steroid injection into the mucosal defect following dilatation.[24] However, a number of questions about steroid injection remain unanswered in relation to optimal timing, location of injections in the oesophagus and the role of repeated injections (box 1).

Other treatment options for refractory strictures include needle knife incision (suitable for short or anastomotic strictures) or temporary stent insertion. This may either be a fully covered self-expanding metal stent (FC-SEMS), removed after 8–12 weeks, or insertion of an uncovered open mesh biodegradable (BD) stent. Stent insertion can be uncomfortable and, as a BD stent cannot be removed once inserted, we recommend using a removable FC-SEMS in the first instance. If single FC-SEMS insertion fails to give long-term benefit, BD stents can be used and repeated on demand making them suitable for long-term management in some highly selected cases. Overall, stent use has a sustained benefit in approximately 30%–40% of patients.[25 26] Alternative options in this challenging group include long-term enteral feeding, self-bougienage or surgery.

CONCLUSIONS

Oesophageal strictures require careful evaluation and an individualised approach to treatment. The updated 2018 BSG guidelines make numerous recommendations: If endoscopy units arrange their services to meet these, patient outcomes should be significantly improved. Nonetheless, there remain numerous areas where high-quality research is lacking and would be opportunities for multicentre trials in the UK.

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