

The management of oesophageal soft food bolus obstruction: a systematic review

D Leopard¹, S Fishpool², S Winter³

¹Cardiff University School of Medicine, Cardiff, UK

²Singleton Hospital, Swansea, UK

³John Radcliffe Hospital, Oxford, UK

ABSTRACT

INTRODUCTION Oesophageal soft food bolus obstruction (OSFBO) is a surgical emergency. However, no national guidelines exist regarding its management. This paper systematically reviews the literature with respect to the management of OSFBO.

METHODS Relevant studies included were identified from the the Cochrane Library, the National Center for Biotechnology Information and the US National Library of Medicine resources. A systematic review was performed on 8 November 2010.

RESULTS

This systematic review of the management of OSFBO shows no evidence that any medical intervention is more effective than a 'watch and wait' policy in enabling spontaneous disimpaction. Furthermore, the use of hyoscine butylbromide for OSFBO probably stems from a misquoted textbook. Surgical removal of an OSFBO is effective but not without potential risk. There is some evidence to support surgical intervention within 24 hours to prevent complications deriving from the initial obstruction.

CONCLUSIONS There is a need for large double-blind, randomised, placebo controlled trials of drugs used in the medical management of OSFBO. Until the results from such trials are available, the treatment of OSFBO will remain based on inconsistent clinical judgement.

KEYWORDS

Esophagus – Esophagoscopy – Review Literature – Dysphagia - Hyoscine N-Butylbromide – Foreign bodies

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CORRESPONDENCE TO

Daniel Leopard, F1 Trainee, Royal Glamorgan Hospital, Ynysmaerdy, Llantrisant, Rhondda Cynon Taff, CF72 8XR, UK
E: dan.leopard@gmail.com

A food bolus obstruction of the oesophagus represents a potentially serious medical problem. It is generally agreed that sharp objects becoming lodged in the oesophagus or objects with a corrosive capacity (eg batteries) should be removed urgently.¹ However, the management of oesophageal soft food bolus obstruction (OSFBO) is less clear. The aim of treatment is to prevent the occurrence of potentially serious complications of bolus obstruction, including perforation and mediastinitis. These complications may occur due to mucosal ischaemia resulting from prolonged impaction or iatrogenically during surgical removal.² In many cases, therefore, the aim of treatment is initially to manage the patient medically to encourage resolution of the obstruction.

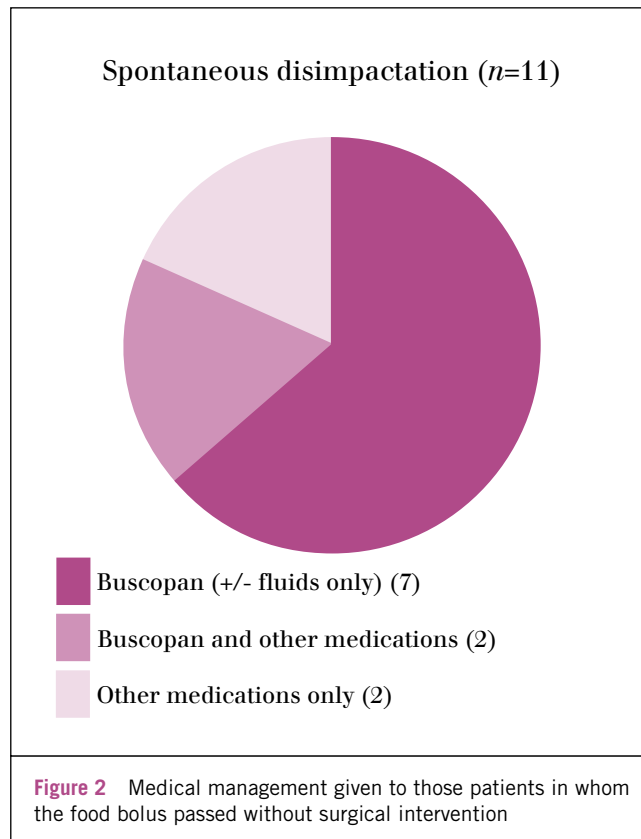
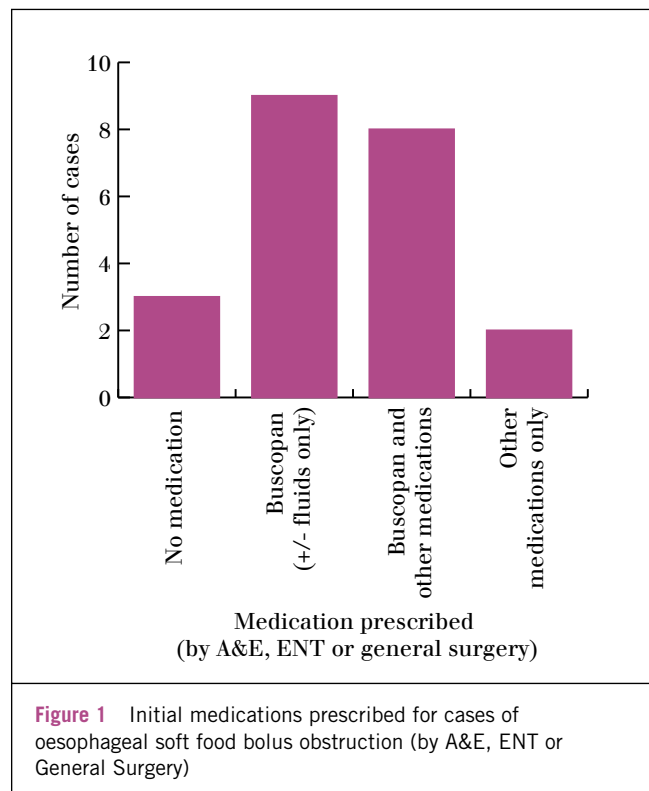
The management of patients with OSFBO frequently involves a variety of specialties, either individually or in combination. These include the emergency care, general surgery and ENT teams. Currently, however, there is no recognised guidance regarding which medications are efficacious in the resolution of OSFBO. Furthermore, the timing of administration of any medical or surgical treatment is often based entirely on clinical judgement. The aim of

this study was to perform a literature review regarding the management of OSFBO.

Methods

A review of the literature was performed to evaluate the published evidence regarding pharmacological and surgical treatment of OSFBO. The Singleton Hospital library information department undertook searches of the Cochrane Library, the National Center for Biotechnology Information and the US National Library of Medicine resources. The following search strategies were used:

- > (oesophagus OR esophagus) AND buscopan – this yielded one case study⁵ and two retrospective cohort studies;^{4,5}
- > (oesophagus OR esophagus) AND (cola OR coke OR coca-cola OR effervescent OR carbonated OR gas forming) – this yielded four retrospective cohort studies^{6–9} and one case report;¹⁰
- > (oesophagus OR esophagus) AND glucagon – this yielded one randomised controlled trial¹¹ and two further studies;^{12,13}



- > (oesophagus OR esophagus) AND (benzodiazepines OR benzodiazepine) – this yielded one randomised controlled trial¹¹ and one retrospective cohort study;¹⁴
- > (oesophagus OR esophagus) AND (opioid OR opioids OR morphine OR codeine) – this yielded no relevant studies;
- > oesophagus AND endoscopy AND bolus – this yielded four retrospective cohort studies^{1,15–17} and one case series;¹⁸
- > oesophagus AND (bolus OR impaction) AND (complication OR complications OR perforation) – this yielded a number of studies.^{1,2,19–21}

Results

There is a wide variation of practice regarding the management of OSFBO. The evidence for the following treatment options are reviewed: hyoscine butylbromide, gas forming agents, glucagon, benzodiazepines, opioids and surgery. A review of complications of surgery is also included.

Hyoscine butylbromide

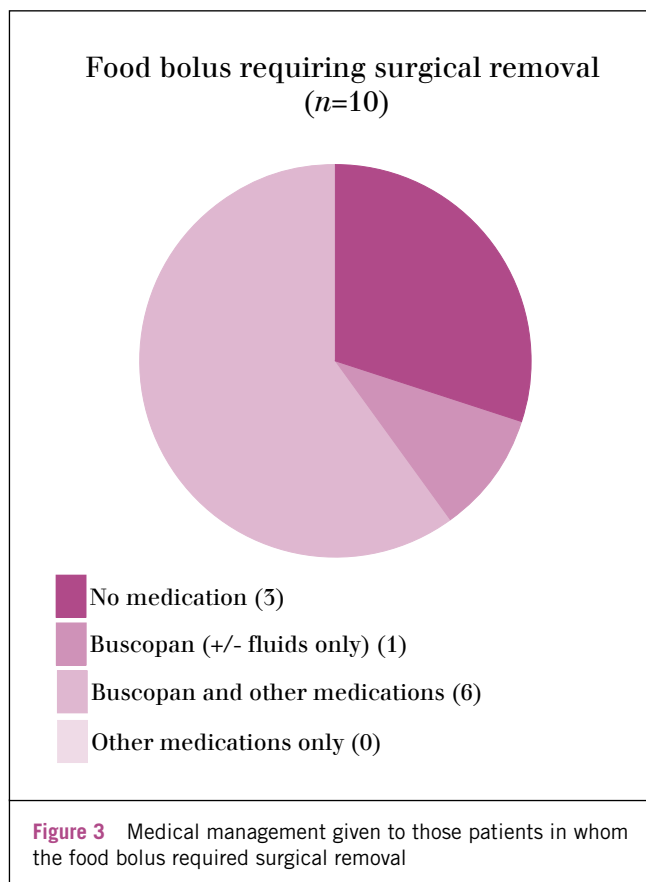
Hyoscine butylbromide use is widely reported in the management of OSFBO. The literature search revealed one case study⁵ and two retrospective cohort studies^{4,5} comparing hyoscine butylbromide against no treatment for OSFBO. These three studies reported on 74 cases in total. The studies concluded that there was no significant difference in disimpaction rates between those patients treated with hyoscine butylbromide and those who received no treatment.

The lack of statistical power to small study sizes suggests larger trials are needed.

The evidence for hyoscine butylbromide as a treatment for OSFBO is questioned in a publication from 2007.²² The advocacy of hyoscine butylbromide appears to stem from a recommendation in a 1997 textbook²³ that misquotes a 1991 study detailing 10 out of 16 patients given 'spasmolytics' who spontaneously disimpacted.²⁴ The study is questioned as a cohort of only 16 patients provides results of low statistical power and, more pertinently, none of the 5 different 'spasmolytic' drugs used in the study actually included hyoscine butylbromide. These facts, along with the potential side effects of the drug, should bring into question whether the medication has a role at all in OSFBO management.

Gas forming agents

On review of the literature, four retrospective cohort studies^{6–9} and one case report¹⁰ were identified. These studies reported disimpaction rates of 100%,⁶ 100%,⁷ 100%,¹⁰ 80%,⁸ and 65%,⁹ with gas forming agents alone. One patient suffered a mucosal tear to the oesophagus.⁹ The total literature on the use of effervescent in OSFBO has low patient numbers and the gas forming agent varies in each study.^{6–9} Nevertheless, the results of the studies were positive, with 79% of cases experiencing disimpaction with a gas forming agent alone or with barium for imaging (as described in the case report¹⁰). This combination therapy has not been replicated in a larger study. Larger trials are needed to provide any strong evidence in favour of their use. However in view



of the fact that fizzy drinks are cheap, safe and apparently effective, their use in the management of OSFBO may be recommended.

Glucagon

Other pharmacological agents identified include glucagon, which reduces oesophageal motor function and relaxes the lower oesophageal sphincter (LOS) in a dose dependent fashion.²⁵ It has not been shown to be effective in treating oesophageal coins in children²⁶ but it has been used in the management of OSFBO.¹⁴⁻¹⁵ A comprehensive search revealed a randomised controlled trial finding no significant difference when comparing glucagon combined with diazepam against placebo for treating OSFBO¹¹ and two studies investigating 92¹² and 222¹⁵ cases of OSFBO. In the first study, all 92 were given glucagon and 30 disimpacted without surgery.¹² In the second study, only 10 of 106 patients given glucagon and 20 of 116 given no medication disimpacted without further intervention.¹⁵ The results suggest that administration of glucagon is no more effective in relieving OSFBO than when no medication is given.

Benzodiazepines

Benzodiazepines have a role in relaxing the LOS and diazepam has the potential to significantly lower LOS pressure on manometry.²⁷ These principles have been considered in OSFBO management. Two appropriate papers were

identified in the literature.^{11,14} A randomised controlled trial found no significant difference in disimpaction rates in patients receiving a diazepam/glucagon combination and those receiving a placebo.¹¹ A retrospective cohort study describes disimpaction without further intervention in 8 of 27 patients who received diazepam.¹⁴ The evidence for the use of benzodiazepines for OSFBO is sparse and the literature suggests they are no more effective than a placebo.

Opioids

Finally, opioids have been reported to cause gastrointestinal dysmotility. Little is known about oesophageal opioid receptors but it is acknowledged that they are present in the LOS.²⁸ However, a comprehensive search revealed no studies investigating the use of opioids for OSFBO.

Surgery

It is well recognised that the mainstay of surgical management in the event of a failure of medical management is endoscopic removal using either rigid or flexible techniques depending on the site of obstruction.²⁹ The search strategy of oesophagus AND endoscopy AND bolus yielded four retrospective cohort studies^{1,15-17} and one case series.¹⁸ Quoted bolus clearance rates at endoscopy were 93%,¹⁵ 98%,^{198%},¹⁶ 100%¹⁷ and 100%.¹⁸ Underlying pathologies were diagnosed in 35%¹⁶ to 90%¹⁷ of cases. The only complications reported were minor oesophageal lacerations in three patients in one study.¹ The figures suggest that endoscopy provides a highly sensitive diagnosis, immediate safe and effective treatment, and identifies the underlying pathology in OSFBO. These low complication rates may not, however, reflect the true rate as authors experiencing many complications may be less likely to publish.

Surgery complications

Odynophagia and oesophageal ulcers: One retrospective cohort study⁴⁹ showed a significantly lower incidence of odynophagia and oesophageal ulcers in oesophageal foreign body (all types) patients treated within 24 hours.

Oesophageal perforation: Soft food boluses have a lower propensity to perforate the oesophagus compared to sharp objects like bones¹ although any oesophageal foreign body compressing the mucosa for a prolonged period may theoretically cause ischaemia. Oesophageal perforation is a possible lethal recognised complication of endoscopic bolus disimpaction² and has the potential to cause mediastinitis. No perforations were recorded in the 426 cases discussed.^{1,15-18} However, there is concern that the risks in a national population may be underestimated. It is thought that perforation risk is slightly higher in rigid than in flexible endoscopy²⁰ although a large study has shown no difference in complication or disimpaction rates between the two.²¹ No literature was identified in which medical management of OSFBO led to perforation.

Oesophageal lacerations: Of all the medical and surgical papers discussed above, only 3 (0.7%) of the 426 oesophagoscopy cases^{1,15-18} and one effervescent-managed patient¹² suffered oesophageal lacerations.

Conclusions

This systematic review of the management of OSFBO suggests that no single medical management strategy appears more effective than a 'watch and wait' approach. Rigid and flexible oesophagoscopy are very effective treatments that do, however, carry well recognised risks. There is some evidence to suggest that surgery performed within 24 hours of the impaction of the food bolus reduces the incidence of complications from the original event.

There is a strong need for large double-blind, randomised, placebo controlled trials of drugs used in the medical management of OSFBO. Furthermore, reliable evidence dictating at what point endoscopy should be undertaken is essential. Until trials like these are performed, the treatment of OSFBO will remain mostly based on inconsistent clinical judgement.

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References

- Smith MT, Wong RK. Foreign bodies. *Gastrointest Endosc Clin N Am* 2007; **17**: 361–382.
- Weissberg D, Refaely Y. Foreign bodies in the esophagus. *Ann Thorac Surg* 2007; **84**: 1,854–1,857.
- Ignotus PI, Grundy A. Disimpaction of swallowed bolus. *BMJ* 1989; **298**: 1,359.
- Thomas L, Webb C, Duvvi S *et al.* Is buscopan effective in meat bolus obstruction? *Clin Otolaryngol* 2005; **30**: 183–185.
- Basavaraj S, Penumetcha KR, Cable HR, Umapathy N. Buscopan in oesophageal food bolus: is it really effective? *Eur Arch Otorhinolaryngol* 2005; **262**: 524–527.
- Rice BT, Spiegel PK, Dombrowski PJ. Acute esophageal food impaction treated by gas-forming agents. *Radiology* 1983; **146**: 299–301.
- Karanjia ND, Rees M. The use of Coca-Cola in the management of bolus obstruction in benign oesophageal stricture. *Ann R Coll Surg Engl* 1993; **75**: 94–95.
- Mohammed SH, Hegedüs V. Dislodgement of impacted oesophageal foreign bodies with carbonated beverages. *Clin Radiol* 1986; **37**: 589–592.
- Zimmers TE, Chan SB, Kouhoukos PL *et al.* Use of gas-forming agents in esophageal food impactions. *Ann Emerg Med* 1988; **17**: 693–695.
- Spinou E, Kubba H, Guse J, Johnston A. The radiological management of oesophageal food bolus obstruction using a gas-forming agent and barium. *Auris Nasus Larynx* 2003; **30**: 103–105.
- Tibbling L, Bjorkhoel A, Jansson E, Stenkvist M. Effect of spasmolytic drugs on esophageal foreign bodies. *Dysphagia* 1995; **10**: 126–127.
- Al-Haddad M, Ward EM, Scolapio JS *et al.* Glucagon for the relief of esophageal food impaction: does it really work? *Dig Dis Sci* 2006; **51**: 1,930–1,933.
- Sodeman TC, Harewood GC, Baron TH. Assessment of the predictors of response to glucagon in the setting of acute esophageal food bolus impaction. *Dysphagia* 2004; **19**: 18–21.
- Giordano A, Adams G, Boies L Jr, Meyerhoff W. Current management of esophageal foreign bodies. *Arch Otolaryngol* 1981; **107**: 249–251.
- Llompert A, Reyes J, Ginard D *et al.* Endoscopic management of foreign bodies in the esophagus. Results of a retrospective series of 501 cases. *Gastroenterol Hepatol* 2002; **25**: 448–451.
- Katsinelos P, Kountouras J, Paroutoglou G *et al.* Endoscopic techniques and management of foreign body ingestion and food bolus impaction in the upper gastrointestinal tract: a retrospective analysis of 139 cases. *J Clin Gastroenterol* 2006; **40**: 784–789.
- Stadler J, Hölscher AH, Feussner H *et al.* The 'steakhouse syndrome'. Primary and definitive diagnosis and therapy. *Surg Endosc* 1989; **3**: 195–198.
- Saeed ZA, Michaletz PA, Feiner SD *et al.* A new endoscopic method for managing food impaction in the esophagus. *Endoscopy* 1990; **22**: 226–228.
- Wu WT, Chiu CT, Kuo CJ *et al.* Endoscopic management of suspected esophageal foreign body in adults. *Dis Esophagus* 2011; **24**: 131–137.
- Gmeiner D, von Rahden BH, Meco C *et al.* Flexible versus rigid endoscopy for treatment of foreign body impaction in the esophagus. *Surg Endosc* 2007; **21**: 2,026–2,029.
- Berggreen PJ, Harrison E, Sanowski R *et al.* Techniques and complications of esophageal foreign body extraction in children and adults. *Gastrointest Endosc* 1993; **39**: 626–630.
- Price T, Jones SE, Montgomery PQ. Is current UK management of oesophageal food bolus obstruction evidence based? An e-mail survey and literature review. *Eur Arch Otorhinolaryngol* 2007; **264**: 329–335.
- Birchall MA, Croft CB. Examination and Endoscopy of the Upper Aerodigestive Tract. In: Kerr AG, ed. *Scott-Brown's Otolaryngology: Laryngology, Vol 5*. 6th edn. Oxford: Butterworth Heinemann; 1997.
- Tibbling L, Stenquest M. Foreign bodies in the esophagus. A study of causative factors. *Dysphagia* 1991; **6**: 224–227.
- Colon V, Grade A, Pulliam G *et al.* Effect of doses of glucagon used to treat food impaction on esophageal motor function of normal subjects. *Dysphagia* 1999; **14**: 27–30.
- Mehta D, Attia M, Quintana E, Cronan K. Glucagon use for esophageal coin dislodgment in children: a prospective, double-blind, placebo-controlled trial. *Acad Emerg Med* 2001; **8**: 200–203.
- Tutuian R. Adverse effects of drugs on the esophagus. *Best Pract Res Clin Gastroenterol* 2010; **24**: 91–97.
- Kraichely RE, Arora AS, Murray JA. Opiate-induced oesophageal dysmotility. *Aliment Pharmacol Ther* 2010; **31**: 601–606.
- Ko HH, Enns R. Review of food bolus management. *Can J Gastroenterol* 2008; **22**: 805–808.