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An ingested mobile phone in the stomach may not be amenable to safe endoscopic removal using current therapeutic devices: A case report



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ABSTRACT

INTRODUCTION: This case report is intended to inform clinicians, endoscopists, policy makers and industry of our experience in the management of a rare case of mobile phone ingestion.

PRESENTATION OF CASE: A 29-year-old prisoner presented to the Emergency Department with vomiting, ten hours after he claimed to have swallowed a mobile phone. Clinical examination was unremarkable. Both initial and repeat abdominal radiographs eight hours later confirmed that the foreign body remained in situ in the stomach and had not progressed along the gastrointestinal tract. Based on these findings, upper endoscopy was performed under general anaesthesia. The object could not be aligned correctly to accommodate endoscopic removal using current retrieval devices. Following unsuccessful endoscopy, an upper midline laparotomy was performed and the phone was delivered through an anterior gastrotomy, away from the pylorus. The patient made an uneventful recovery and underwent psychological counselling prior to discharge.

DISCUSSION: In this case report, the use of endoscopy in the management when a conservative approach fails is questioned. Can the current endoscopic retrieval devices be improved to limit the need for surgical interventions in future cases?

CONCLUSION: An ingested mobile phone in the stomach may not be amenable for removal using the current endoscopic retrieval devices. Improvements in overtubes or additional modifications of existing retrieval devices to ensure adequate alignment for removal without injuring the oesophagus are needed.

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1. Introduction

Foreign body ingestion is a relatively common emergency problem. The majority of cases occur in the paediatric population [1,2]. Those with psychiatric disorders, developmental delay, alcohol intoxication and prisoners are also at increased risk [3–6]. General clinical guidelines on diagnosis and management of ingested foreign bodies have been published by the American Society for Gastrointestinal Endoscopy (ASGE) [6] and more recently, by the European Society for Gastrointestinal Endoscopy (ESGE) [7]. Specific guidelines for the management of gastric foreign bodies also exist but are confined to common objects such as coins, magnets, narcotic packets and disc batteries [6].

The management of a rare case of a patient who swallowed a mobile phone with particular focus on the lessons learned from the failed endoscopic management of the object is therefore presented here. This manuscript is written in accordance with the CAsE REport

(CARE) guidelines [8]. The report is intended to inform clinicians, endoscopists and industry on our experience in the management of this unusual case.

2. Presentation of case

A 29-year old male prisoner was brought in by ambulance to the Emergency Department with a four-hour history of vomiting, having claimed to have swallowed a foreign object six hours earlier that day. He had no other associated symptoms. Of note, he had complex psycho-social issues.

He was haemodynamically stable. Clinical examination was unremarkable. All laboratory investigations were normal. An erect chest X-ray partially showed the mobile phone in the epigastrium and there was no free air within the abdomen. An abdominal plain film revealed the complete device in the stomach (Fig. 1). The patient was admitted and managed conservatively. He was kept nil by mouth and commenced on intravenous fluids and proton pump inhibitors. A repeat abdominal radiograph, approximately eighteen hours after the reported time of ingestion, showed that the mobile phone remained in situ in the stomach and had not passed through

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Fig. 1. Plain film abdomen showing the mobile phone.

the pylorus. At this time, the patient was consented for removal under general anaesthesia (Fig. 2).

The patient was brought to the operating theatre, intubated and the initial intervention was an upper gastrointestinal endoscopy. The findings are shown in Fig. 3. Following failed attempts at endoscopic removal, using endoscopic snares, graspers, tripod forceps and baskets, the endoscopic approach was abandoned. The mobile phone could not be aligned correctly to allow for a safe retrieval while limiting the potential harm to the oesophagus. The use of overtube was not an option in this case due to the size of the phone. An upper midline laparotomy was then performed and an Alexis® O Wound Protector was used to protect the wound. A gastrotomy (3–4 cm) was made in the anterior stomach away from the pylorus. The phone was delivered through the gastrotomy by manual manipulation assisted by Babcock forceps. The dimensions of the foreign body were 68 × 23 × 11 mm. This was followed by a two-layer gastrotomy closure, fascial and skin closure. A nasogastric tube was placed during the surgery and secured with a bridle. The mobile phone was sent as a specimen for forensic examination.

Postoperatively, the patient received analgesia, two further doses of antibiotics, and was kept nil by mouth for three days. He received intravenous fluids and proton pump inhibitors during the period of fasting. The nasogastric tube remained in situ for a further three days. He also received chest physiotherapy and was seen by the psychiatrist before discharge. He passed a bowel motion on the 6th postoperative day and was discharged well on the 7th postoperative day. He was reviewed in the out-patient clinic four months later. He was well with no symptoms at this point.

3. Discussion

Surgery (laparotomy or laparoscopy) is required in less than 1% of cases of foreign body ingestion as most will resolve with

conservative management or require endoscopy in approximately 10–20% of cases [7].

Consenting the patient for laparotomy before the patient was anaesthetised was considered to be an important learning point, given the limitation of endoscopy in this case. This approach helped to limit the dilemma of waking up the patient again to discuss surgery or the pressurized attempt at taking out a malignant object endoscopically with potential risks of injury to the oesophagus. Similarly, if the intervention were to be carried out by a gastroenterologist under anaesthesia, we would recommend that the on-call surgeon should be consulted before the patient is anaesthetized and the surgeon should be in-house in case a surgical intervention is required. Further, the site of incision, wound protection technique, and outlined postoperative care limited the morbidities in this case. Additional modern perspectives in the management also include the psychological evaluation before discharge. As the patient was a prisoner, the mobile phone had to be sent as a specimen for forensic examination.

The failure of endoscopy to remove the mobile phone, in this case, highlights the limitations of this approach. The traditional sequence of conservative approach, endoscopy and surgery when endoscopy fails is challenged. This observation has raised a new question: should clinicians proceed directly to surgery when clinical observation fails in these cases or should endoscopy still be attempted? The potential benefit of endoscopy is that it may be used as a minimally invasive bridge to surgery in cases of failed conservative management. There were no specific guidelines in the management of this case [6,7]. The object size described here was within the upper limit of what would have also been considered for conservative management in prisoners [9]. The presence of continued symptoms and failure to progress within 18 h of conservative management were indications for proceeding with endoscopic removal under general anaesthesia. In this case report, upper GI Endoscopy also helped to confirm the diagnosis as well as the object's failure to progress along the gastrointestinal tract.

Besides these clinical management pearls, there are also other aspects of the endoscopic management of this patient which affect industry and policy makers. Our experience in this case was that an overtube was not an option due to the size of the object and we also could not find any other suitable retrieval devices that ensured correct alignment for endoscopic removal of the mobile phone through the oesophagogastric junction. Needed now is the development of self-expandable overtubes that can accommodate such objects without risk of damaging the oesophagus. The alternative is for industry to create or improve on existing retrieval devices to ensure adequate alignment for removal as shown in Fig. 4. Such improvement, ideally should be tested in-vitro before being considered in human subjects. Successful endoscopic removal of a foreign object obviates the need for surgery and associated morbidity. There are also potential health savings in terms of reduced length of stay and health costs if surgery could be avoided.

Finally, unlike most other cases of foreign body ingestion, the specific case of ingestion of mobile phone is underreported in the literature. The only case report of mobile phone ingestion which we could find in PUBMED database was that of a 35-year old intoxicated male with pharyngeal impaction by a mobile phone who had the phone endoscopically removed under a general anaesthesia [10]. A few other anecdotal reports of mobile phones lodged in the stomach exist in non-scientific literature, but the current management, or quality improvement issues are not entirely described. Besides detailing the full management of such an under-reported case, we have described how our findings might affect clinicians, industry and policy makers.

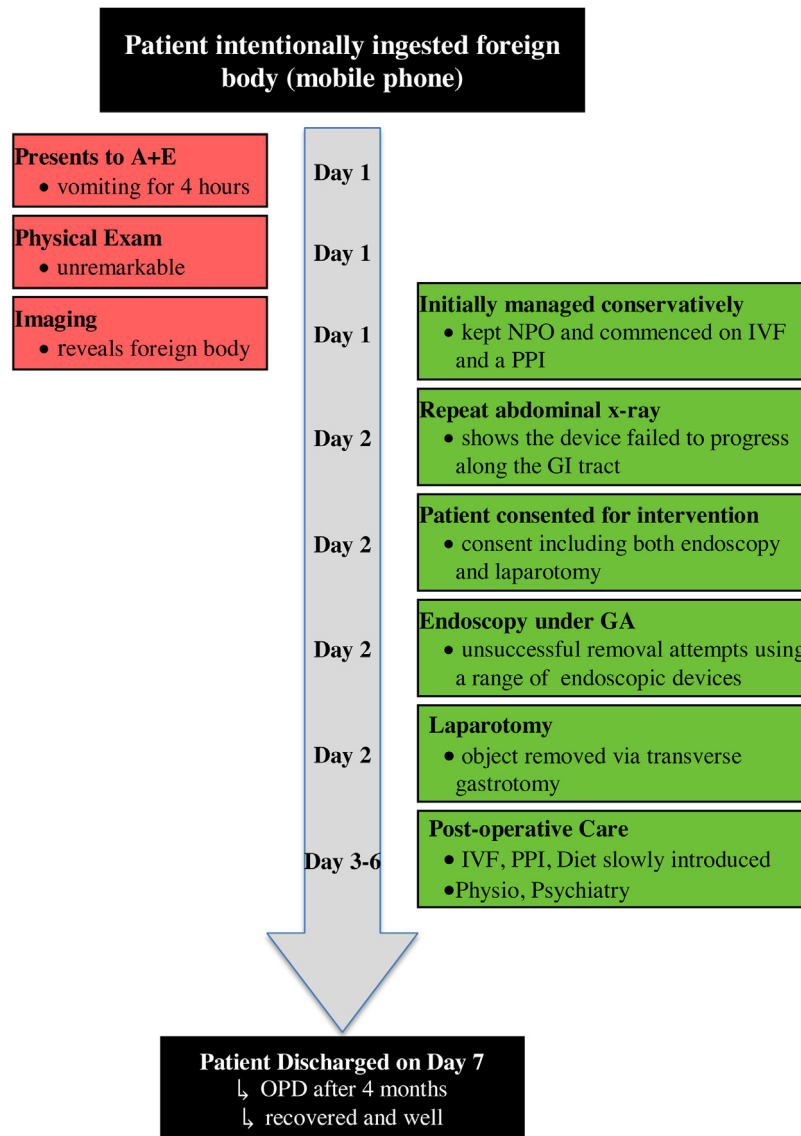


Fig. 2. Timeline.

4. Conclusion

An ingested mobile phone in the stomach may not be amenable for safe removal using the current endoscopic retrieval devices. Therefore we recommend that all patients undergoing endoscopic removal of a mobile phone should be consented for a laparotomy. As well as this, there is need for the development of self-expandable overtubes or additional improvement on existing retrieval devices to ensure adequate alignment for removal without risks of damage to the oesophagus.

Conflict of interest

The authors have no conflicts of interest to disclose.

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Ethical approval

An ethical approval was not required.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Submission declaration

The authors declare: that the work described has not been published previously, that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere including electronically in the same form, in English or in any other language, without the written consent of the copyright holder.



Fig. 3. Gastroscopy showing the mobile phone in the stomach.

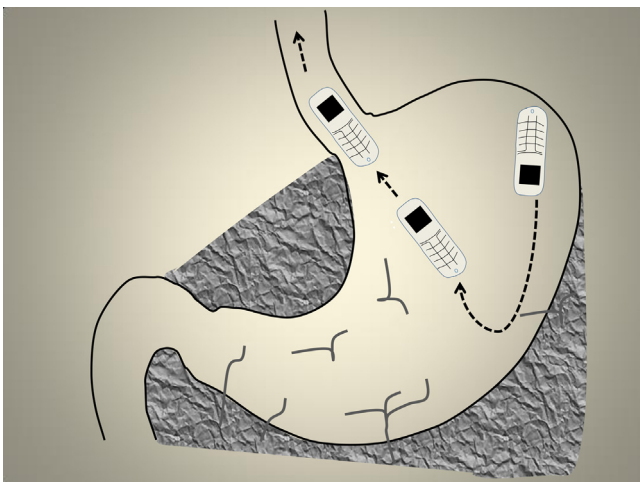


Fig. 4. Ideal endoscopic alignment for safe removal.

Author contributors

O.O. and D.C. contributed equally in this case report. O.O. and D.C. conceived the initial idea of the study. J.O.R., O.O., and D.C. acquired the data for publication. O.O. and D.C. drafted the article, and all authors revised it critically for important intellectual content. All authors approved the final version of the manuscript to be submitted.

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