Rationalising the management of swallowed coins in children

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Abstract

Objective—To assess the management of swallowed coins in children and identify aspects that could be improved.

Design—Study of records of three hospital departments for 1986-90.

Setting—Accident and emergency, radiology, and operating theatre departments in a children's hospital.

Subjects—50 children reported to have ingested coins.

Main outcome measures—Radiological investigations performed, position of coin, symptoms of child, and surgical intervention.

Results—50 children were recorded to have swallowed coins during 1986-90. Five children had only chest radiography, five only abdominal radiography, and 40 had both. A coin was detected in the oesophagus in 15 children, six of whom had symptoms, and below the cardia in 26, none of whom had symptoms; no coin was seen in nine children. Eleven children had further abdominal radiographs despite the absence of gastrointestinal symptoms; one child had a coin removed from the stomach.

Conclusions—Children are being unnecessarily exposed to radiation and surgical intervention, and a consensus on management of swallowed coins is needed. Most children require only a single chest and neck radiograph.

Introduction

Coins are the foreign bodies most commonly swallowed by children,¹ and the management of this problem is hampered by a lack of clear guidelines. The problem may confront the general practitioner, accident and emergency doctor, paediatrician, paediatric surgeon, or radiologist. Standard paediatric surgical textbooks recommend an initial radiograph of the whole oesophagus and abdomen, and, for coins that have passed beyond the cardia, an abdominal radiograph every five to seven days unless the object is recovered in the stools; surgical intervention is recommended if the object has failed to progress after four weeks.² We reviewed the management of swallowed coins at our hospital.

Patients and methods

We examined the records of the accident and emergency, radiology, and operating theatre departments for cases in which children had reportedly ingested coins during 1986-90.

Results

We found 50 children reported to have ingested coins: 27 boys and 23 girls, median age 3.2 (range 1.0-

Proposed scheme for managing children who have swallowed coins

10.0) years. In nine children radiographs showed no visible coin. Six of the 15 children with coins in the oesophagus had symptoms (principally choking or epigastric discomfort). None of the 26 children whose coins had passed beyond the cardia had symptoms. Preliminary radiological investigations were only a chest radiograph in five children, only an abdominal radiograph in five, and chest (including cervical oesophagus) and abdominal radiographs in 40. There seemed to be no rationale for the type of radiograph requested except that two of the five chest radiographs were taken in children with oesophageal symptoms.

Thirty one children had swallowed pennies, 10 had swallowed 20 pence pieces, four pound coins, and the remainder other denominations. Among the children with coins in the oesophagus, the coin spontaneously passed to the stomach within 12 hours in five children, and the coins were successfully removed by endoscopy or bougienage in the other 10. Of the 26 coins visible below the diaphragm, 25 passed uneventfully and one was endoscopically removed from the stomach for failure to progress after 16 days. The follow up radiological investigations in the children with coins below the diaphragm are of particular interest. Eleven children had further abdominal radiographs to monitor the passage of the coin despite the absence of gastrointestinal symptoms; two children had four abdominal radiographs.

Discussion

There is no reason to believe that management in our hospital differs from that elsewhere and, to some extent, this reflects the lack of consensus on the management of swallowed coins. At present children

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are exposed to unnecessary and potentially harmful radiation and surgical intervention and, in addition, resources are wasted. Large studies of children who have swallowed foreign bodies do not show that ingested coins that have passed beyond the cardia cause complications in children with a normal gastrointestinal tract^{1,3}; only one such case seems to have been described.⁴ Furthermore, the potential hazard of prolonged asymptomatic gastric retention of swallowed coins (more than two weeks) may have been exaggerated. In our experience such coins eventually pass spontaneously and, under experimental conditions of gastric acidity, the dissolution of toxicologically significant quantities of metal is unlikely to occur (I M House, National Poisons Unit, Guy's Hospital, London, personal communication).

The management of swallowed coins in children in the United Kingdom could be improved. Adopting the scheme outlined in the figure would reduce the radiation dose received by many children and produce a considerable financial saving. An initial single anteroposterior radiograph of the neck and chest is advisable even in asymptomatic patients because of the dangers from silent oesophageal impaction.⁵ A lateral radiograph may then be necessary to localise coins in the

neck and upper chest. When the coin is below the cardia only symptomatic patients require further assessment. Searching of stools is both unpleasant and inaccurate.

Children who swallow other types of foreign bodies or whose gastrointestinal tracts are abnormal from known congenital stenoses or previous surgery must be judged individually. Many children swallowing other foreign bodies can be managed by a similar policy of minimal intervention, but previous surgery, such as pyloromyotomy, should alert doctors to the possibility of abnormal retention of the coin and indicates the need for follow up.⁶

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- 5 Swallowed coins [editorial]. *Lancet* 1989;ii:659-60.
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Therapeutic ratio and defined phases: proposal of ethical framework for palliative care

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I cannot define an elephant but I know one when I see one.¹

The everyday practice of oncology and palliative care raises complex moral issues. Examples include: When should radical curative treatment be stopped—or rejected from the outset as an option? Do measures for the relief of symptoms shorten life? When should active drug treatments—for example, antibiotics and steroids—be stopped? (Similar questions can be asked about support of physiological systems: blood transfusion, ventilation, renal dialysis, intravenous hydration and nutrition.) What steps should be taken when food and drink can no longer be taken by mouth? How should we deal with differences of opinion about management arising among patient, family, and carers? What is the relation between euthanasia and palliative care? We propose to examine these questions in a framework that divides the therapeutic interaction into three phases or modes: curative, palliative, and terminal.

Risk-benefit analysis or the therapeutic ratio is widely used in pharmacology and oncology to describe the ratio of risk of unwanted side effects (treatment related toxicity, morbidity, or mortality) to desired effect. Without determining the therapeutic ratio well reasoned or informed clinical decisions cannot be made as most proposed actions will have both desired and unwanted outcomes.

The probability of expected effects or end points may be defined by either the doctor or the patient.

There may well be congruence or disagreement between these points of view. Mitchell discussed this observer variation with regard to the prevention of postoperative pulmonary emboli, for which some studies had shown an improvement in the radiological end points, but the only question the patients were interested in was whether they would die of a pulmonary embolus.² Similarly, with the treatment of cancer a tumour response may or may not be translated into a survival advantage or better control of symptoms for the patient.^{3,4} Observer variations among patients, carers, and staff; differential goal setting; and problems of evaluation are all well documented.^{5,7} In our model all treatments that are thought to offer partial responses are classed as palliative, and it requires that the partial response must also have some favourable influence on symptom control or quality of life. The table summarises the three phases or modes.

Curative, palliative, and terminal modes

The curative mode is the phase of therapeutic intervention in the natural course of a disease in which cure or durable complete remission is a realistic expectation. Prolongation of life and survival are the aims, and a high rate of treatment related toxicity and morbidity, and even a low level of mortality, may be acceptable. Comfort is a secondary issue; when a comfort measure conflicts with survival the supremacy of survival is the dominant theme.

The palliative mode is a phase in the natural course of a disease in which curative treatment is not expected to prolong life. Alternatively, the gain in weeks or months that might reasonably be expected may be seen to be outweighed in quality or value by the intensity or duration of the treatment related toxicity, morbidity, or risk of mortality. Therapeutic endeavours or investigations are directed at the supremacy of comfort, symptom relief, and general wellbeing. The level of

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Priorities in three modes of treatment of incurable disease

Mode	Supremacy	Survival	Toxicity	Measures to support physiological systems	Artificial hydration and alimentation
Curative	Survival	Prolong	May be high	Yes	Yes
Palliative	Quality and value of life	No	Low	Maybe (for quality only)	Maybe (for quality only)
Terminal	Quality and value of life	No	None	No	No