

THE MANAGEMENT OF FOREIGN BODIES IN THE ALIMENTARY TRACT*

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EVERY PHYSICIAN at some time has the problem of properly managing a patient with a foreign body in the alimentary tract. The most important considerations are: Is operative treatment indicated? If not, what constitutes a good conservative program? In order to formulate definite principles for managing such patients at Wayne County General Hospital we have reviewed the cases seen here in recent years.

MATERIAL

This study extends over an 11-year period from 1939 to 1950 and includes 59 patients who had swallowed foreign bodies of various types (Table I). One-fourth of the patients were psychotic. The ages of the patients ranged from 11 months to 88 years with approximately 60 per cent of the non-psychotic patients being under five years of age.

Table II lists the types of foreign bodies found in this group of patients. They varied considerably in size and shape, as shown in Figure 1. Of the blunt group, coins and closed safety pins were the chief offenders. The largest objects were the spoon handles which were removed from the stomach by operation. Sixty-three per cent of these blunt objects passed spontaneously, while the remainder were removed by means of esophagoscopy, celiotomy or, in the case of rectal foreign bodies, by manipulation.

Of the sharp objects, glass fragments, razor blades and pins were most common. Greater concern was expressed in the case of sharp objects than of blunt objects. However, in contrast to the 63 per cent of the blunt objects which passed spontaneously, 80 per cent of the sharp objects cleared the gastro-intestinal tract without operative intervention. We believe that, given an adequate trial, the most formidable of objects will, in most instances, pass spontaneously without harming the gastro-intestinal tract (Fig. 2).

ESOPHAGEAL FOREIGN BODIES

Figure 3 depicts the points in the esophagus at which 21 foreign bodies were arrested in our series. Ten lodged at the cervical constriction or cricopharyngeal pinchcock, five at the broncho-aortic constriction and four at the diaphragmatic constriction.

Esophagoscopy was carried out in 20 of our 21 patients (Table III). A general anesthetic, as recommended by others^{17, 21} was used in all cases. We found it to be satisfactory. Eighteen objects were successfully removed and one forced into the stomach.

In one case in which esophagoscopy removal was unsuccessful, the object later passed spontaneously. In another case a quarter dollar, which on first examination was found to be lying at the level of the diaphragmatic constriction, passed spontaneously. No complications occurred as a result of esophagoscopy.

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The decision must be made in these cases as to whether operative intervention is necessary or not. Foreign bodies found in the esophagus are accessible and may be removed by esophagoscopy. However, it must be recognized that esophagoscopy is not an innocuous procedure. Proper facilities, trained personnel and special instruments are necessary.

TABLE I.—Types of Patients.

I. Non-psychotics—44	
Ages—Under 5 years	26
Between 5 and 15 years	8
Between 15 and 75 years	10
II. Psychotics—15	
Ages—Between 18 and 88 years	

We now agree with Burman that many foreign bodies found in the esophagus need not be removed.⁵ Matheson reviewed 602 cases of esophageal foreign bodies.¹⁷ Of these, no foreign bodies were found by esophagoscopy in 225 cases despite the fact that all symptoms pointed to their presence. The symptoms were accounted for by mucosal laceration in 77 of these cases. In the remaining 148 cases, all of the foreign bodies had been demonstrated to be in the esophagus by roentgen ray but either passed into the stomach before esophagoscopy was attempted or before they could be grasped with a forcep. They were all later passed in the stool without complication. Matheson also states that only 22 per cent of foreign bodies which lay below the cervical constriction when first seen produced persistent symptoms.

These observations would indicate that the great majority of esophageal foreign bodies will pass without trouble. This is further substantiated by the fact that almost all of the foreign bodies in Carp's large series,⁷ regardless of their magnitude, were lying below the level of the esophagus when first demonstrated by roentgen ray.

Indications for Operation. In the light of our study we have set up arbitrary indications for the operative treatment of esophageal foreign bodies.

We advocate the removal of all objects lying above the cricopharyngeus, for in these instances the dangers of esophagoscopy are relatively minor. For an object found below the cricopharyngeus, immediate attempts at removal by esophagoscopy should *not* be made unless, because of the size or shape of the object, it is thought unlikely that it will pass into the stomach.

If, by roentgen ray examination, the object has not progressed in a period of 24 hours, esophagoscopy should be carried out. It has been our experience that a longer waiting period has made removal more difficult because edema and necrosis resulted in tighter impaction of the object. If difficulty is encountered in withdrawing the object through the esophagoscope and

TABLE II.—Types of Foreign Bodies.

Dull	Sharp
Coins 10	Open safety pins 7
Closed safety pins 10	Needles and straight pins 11
Marbles 1	Jack rocks 2
Spoon handles 3	Rosary 1
Fruit pits 6	Sardine can opener 1
Rings 1	Bobby and hair pins 9
Locketts 1	Glass 27
Buttons 2	Meat, fowl, fish bones 5
Metal bracelets 1	Furniture ornaments 1
Razor handles 1	Broken razor blades 11
Meat chunks 1	Nails and screws 7
Fruit peels 1	Bed spring supports 1
	38
Passed spontaneously 23	Passed spontaneously 66
Removed by operation 15	Removed by operation 17

it can be advanced into the stomach, it is acceptable to do so.³

Persistent symptoms occur occasionally in patients despite the fact that no object can be visualized on roentgen ray examination.¹⁷ Again, following 24 hours of watchful waiting, esophagoscopy should be done to rule out the presence of a radiolucent foreign body. If impaction occurs in infants or young children below the cervical esophagus, the presence of a congenital esophageal stricture should be considered. In these cases, the parents should

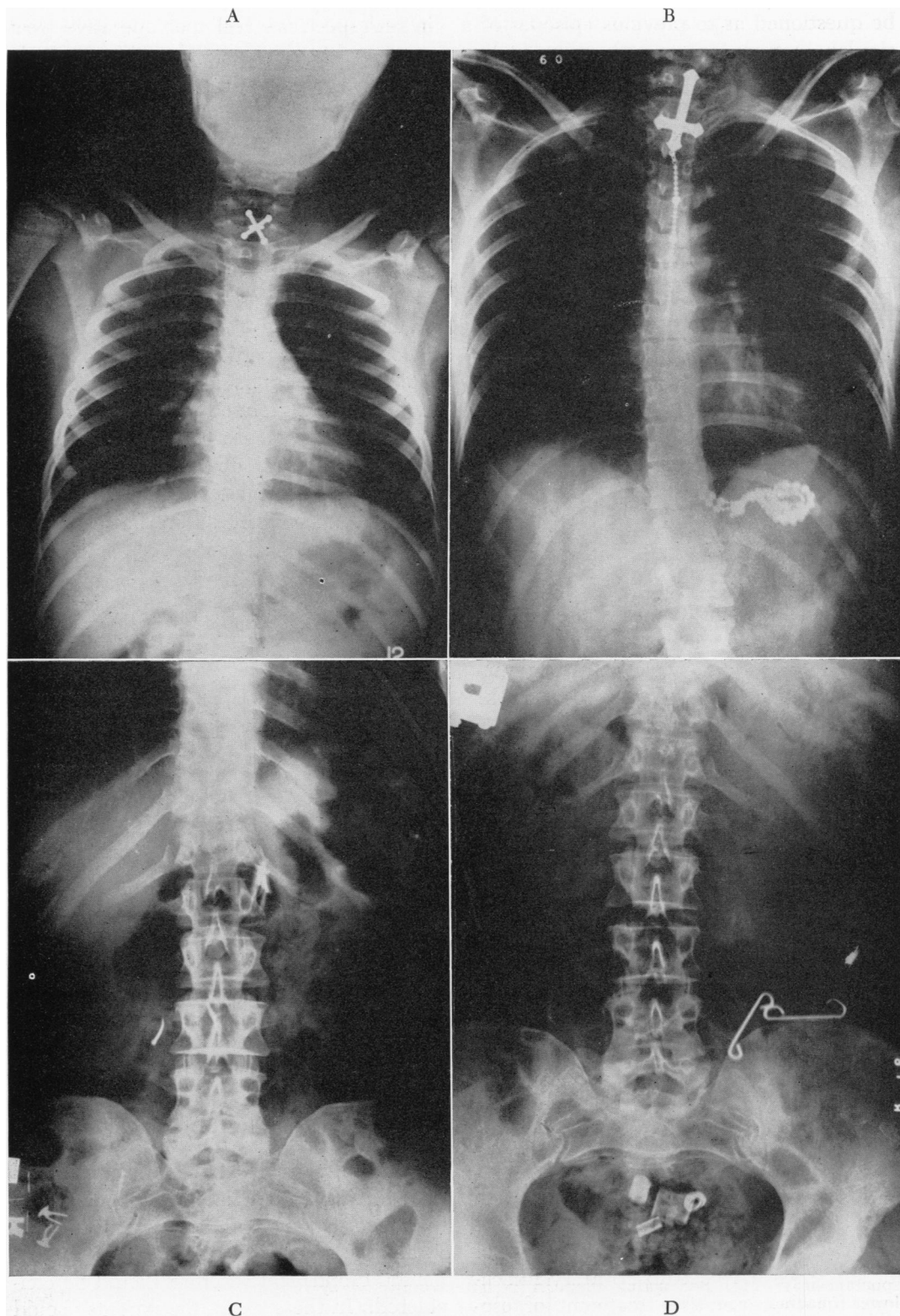


FIG. 1.—See opposite page for legend.

be questioned as to previous episodes of a similar nature or as to past feeding problems.^{10, 15}

In patients with symptoms or signs of obstruction, hemorrhage or mediastinitis,

TABLE III.—*Management of Esophageal Foreign Bodies in 21 Patients.*

Operative Management	
Esophagoscopy—20	
Indications	Results
Obstruction..... 10	Removed..... 18
Unlikely to pass..... 7	Forced into stomach.. 1
Questionable..... 3	Failed—later passed spontaneously..... 1
—	—
20	20
Thoracotomy—0	
Conservative Management	
Passed spontaneously—1	

removal of the foreign body by esophagoscopy or thoracotomy is indicated. When mediastinitis is present effort should be made to control it before intervention.¹

GASTRO-INTESTINAL FOREIGN BODIES

Our experience with gastro-intestinal foreign bodies in 38 patients is summarized in Table IV. Four celiotomies were carried out. Included were a gastrotomy for three open safety pins, a gastrotomy for three spoon handles, a duodenotomy for an open safety pin located in the second portion of the duodenum, and an ileotomy for a large beef bone which had perforated the lower ileum at two points. Of the two patients on whom a gastrotomy was performed and the one patient on whom a duodenotomy was performed, none presented any signs or symptoms of appreciable importance. Two of these patients had ingested the foreign bodies only 24 hours prior to operation and,

FIG. 1.—Various foreign bodies encountered. (A) Jackrock at cervical constriction of esophagus removed through esophagoscope. (B) Crucifix at cervical constriction with end of chain in stomach, removed through esophagoscope. (C) Several nails and fasteners scattered from the left epigastrium to the right lower quadrant, which passed spontaneously. (D) Bed spring supports in left lower quadrant and glass fragments in pelvis, which passed spontaneously.

in retrospect, we feel that operative treatment could have been delayed in favor of a period of conservative management. The spoon handles had been ingested some months prior to admission and were discovered on routine roentgen ray examination. They were removed because of failure to progress over a long period of time.

The foreign bodies in the remaining 34 patients passed spontaneously, except in three cases in which it was necessary to remove the objects from the rectum. The removal of these objects from the rectum was relatively simple and did not pose the problems discussed by Chisholm⁸ and Wagner.²²

As stated by Silvernale, most of the duodenum is immobile, forming a rigid tunnel with deep rugal folds which tend to impede the progress of objects.¹⁹ The anatomical features of the ileocecal region make it the most common site below the diaphragm for the arrest of foreign bodies.

TABLE IV.—*Management of Gastro-intestinal Foreign Bodies in 38 Patients.*

Operative Management—4 Patients	
Operations	Indications
1. Gastrotomy—3 open safety pins	1. Questionable
2. Gastrotomy—3 spoon handles	2. Arrest of progress
3. Duodenotomy—1 open safety pin	3. Questionable
4. Ileotomy—bone fragment	4. Perforation
Conservative Management—34 Patients	
Passed spontaneously.....	31
Manipulative removal from rectum.....	3

Although in only one case in our series did objects become lodged for a period longer than one week, it was at the points indicated that progress was found to be delayed. In the one case three spoon handles were removed from the stomach by operation because of failure to progress for over three months.

In a series of 93 cases with perforation collected from the literature by McManus, appendiceal perforation occurred in 36 per cent.¹⁶ Twenty-one per cent of the perforations occurred at the ileocecal region. Numerous instances of perforation at other

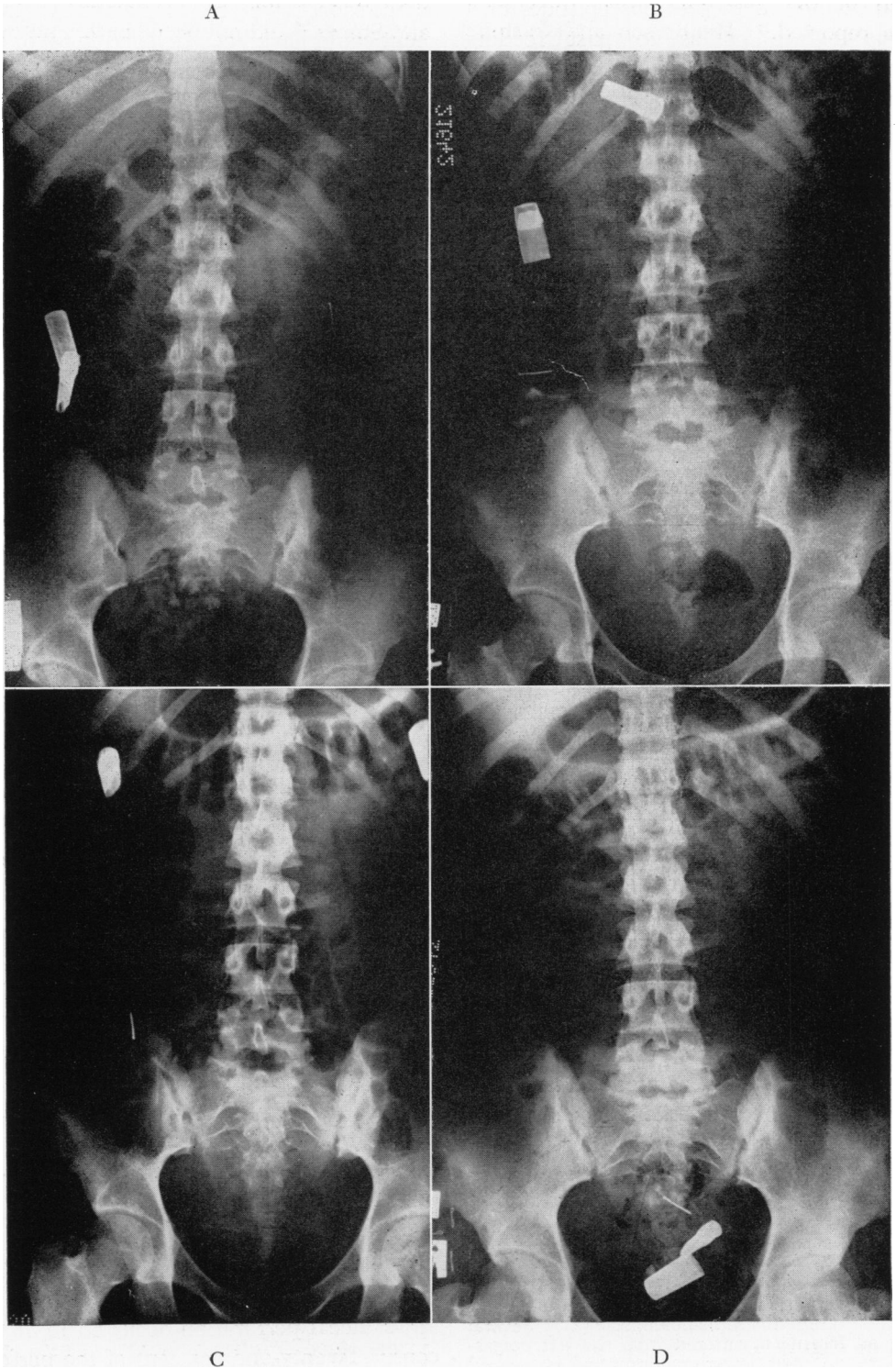


FIG. 2.—The relationship between the two parts of a lipstick holder and a straight pin during their progress through the large bowel.

levels of the gastro-intestinal tract have been reported.¹² Henderson and Gaston¹³ reviewed a series of 800 cases at Boston City Hospital and report that only nine perforations occurred, an incidence of about 1 per cent.

The natural ability of the intestine to withstand injury and perforation was dramatically demonstrated by Exner's experimental work reported in 1902.¹¹ By stroking or pricking the intestinal mucosa of animals

tinal obstruction, as discussed by Burke⁴ and Storck,²⁰ did not occur in this series.

It is our belief that many patients who swallow foreign bodies probably never come to the attention of a doctor either because it is not known that a foreign body has been swallowed or because the symptoms are not sufficiently serious to cause the patient to seek medical advice. Particularly did we think this might be true among psychotic patients, of which there is a large number at this institution. We were somewhat astonished when roentgen ray examination of 100 psychiatric patients revealed no gastro-intestinal foreign bodies.

Indications for Operation. In view of the above we believe that operative treatment of gastro-intestinal foreign bodies is not necessary except when definite indications are present. Operative removal may be carried out when it is thought that the objects, because of their size or shape, are unlikely to pass spontaneously or are likely to perforate the bowel. Such instances will be rarely encountered.² We have adopted a policy of observation for a period of four weeks before concluding that a foreign body is definitely impacted. If no progress is seen on roentgen ray examination at the end of this period, operation is performed. Even a longer period of observation may be considered. The literature is replete with instances of foreign bodies which, although retained for many months or years, have eventually passed spontaneously.⁹ A darning needle retained for 20 years, a fork for 465 days, a saber blade for one year and a spoon retained for ten years did not produce symptoms and passed without complication. Such a patient was recently illustrated in "Life" magazine. This patient, referred to as a "human junk pile," had ingested numerous objects, including parts of five bedsprings, six razor blades, three needles, three safety pins, eight straight pins, two spoon bowls, ten pieces of steel ripped from his bed, crushed glass

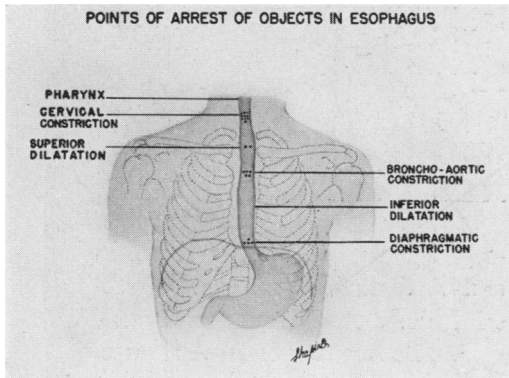


FIG. 3.—Points of arrest of objects in esophagus.

with sharply pointed objects he was able to produce an area of ischemia, in the center of which developed a gross concavity.⁶ These phenomena resulted from contractions of the muscularis mucosa and occurred even when the seromuscular layer of bowel wall had been removed. The lumen of the bowel was increased at the point of irritation, giving the foreign body greater freedom for progression.

Exner¹¹ and numerous other investigators introduced a large number of sharply pointed objects into the intestinal tract of animals with *points* in an isoperistaltic direction. An overwhelming majority of these objects were eventually passed spontaneously with the *heads* being isoperistaltic. This protective action on the part of the bowel is illustrated by the serial roentgen rays in Figure 4.

Of our cases, perforation of the lower ileum occurred in only one patient. Intes-

from two light bulbs and a salt shaker. All of these objects passed spontaneously.

Symptoms or signs of obstruction or peritonitis dictate immediate operation following proper preparation. Severe gastro-intestinal hemorrhage indicates marked damage to the bowel and dictates operative removal of the offending object.

and highly recommend it.^{14, 18, 23} It is our belief that this procedure would be complicated and is unnecessary.

Roentgen ray examination should be carried out daily for the first three days and every second day thereafter. It must be remembered that roentgen ray examination in both antero-posterior and lateral views is

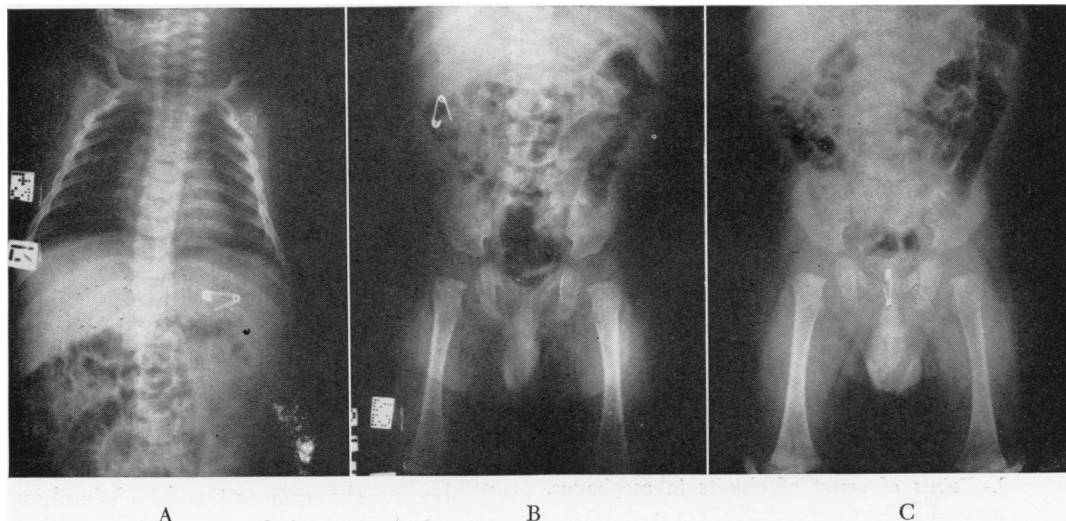


FIG. 4.—Serial films illustrating the rotation of a safety pin and its progress, blunt end forward (A, B and C)

Conservative Treatment. The principles of conservative management which we adhere to are as follows: All patients who have swallowed moderately large or sharp objects should be hospitalized until one is certain that no untoward complications will occur and that progress is maintained. A general diet is satisfactory but roughage should be avoided. Just as in the case of acute appendicitis, such measures as catharsis and gastric lavage are to be *condemned*.

We have not found the swallowing of cotton balls or other tricks to be of any advantage. We have not used magnets in an effort to withdraw foreign bodies from the upper alimentary canal. Others have described the successful use of this proce-

desirable. Careful examination of each stool should be made in an effort to recover the foreign body.

CONCLUSION

1. In later years we have adopted a more conservative plan of management of gastro-intestinal foreign bodies.

2. Operative treatment is advised only if the following specific indications are present:

- a. Failure of a foreign body to progress.
- b. Presence of a foreign body unlikely to pass spontaneously.
- c. Presence of a foreign body likely to penetrate the bowel.
- d. Symptoms or signs of obstruction, mediastinitis, or peritonitis.
- e. Gastro-intestinal hemorrhage.

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