Diseases of the Colon & Rectum

Management of Retained Colorectal Foreign Bodies: Predictors of Operative Intervention

Jeffrey P. Lake, M.D.,[1] Rahila Essani, M.D.,[1] Patrizio Petrone, M.D.,[1,2] Andreas M. Kaiser, M.D.,[1] Juan Asensio, M.D.,[1,2] Robert W. Beart, Jr., M.D.[1]

[1] *Department of Colorectal Surgery, Keck School of Medicine, University of Southern California, Los Angeles, California*

[2] *Department of Surgery, Keck School of Medicine, University of Southern California, Los Angeles, California*

PURPOSE: This study was designed to review experience at our hospital with retained colorectal foreign bodies. METHODS: We reviewed the consultation records at Los Angeles County + University of Southern California General Hospital from October 1993 through October 2002. Ninety-three cases of transanally introduced, retained foreign bodies were identified in 87 patients. Data collected included patient demographics, extraction method, location, size and type of foreign body, and postextraction course. RESULTS: Of 93 cases reviewed, there were 87 individuals who presented with first-time episodes of having a retained colorectal foreign body. For these patients, bedside extraction was successful in 74 percent. Ultimately, 23 patients were taken to the operating room for removal of their foreign body. In total, 17 examinations under anesthesia and 8 laparotomies were performed (2 patients initially underwent an anesthetized examination before laparotomy). In the eight patients who underwent exploratory laparotomy, only one had successful delivery of the foreign object into the rectum for transanal extraction. The remainder required repair of perforated bowel or retrieval of the foreign body *via* a colotomy. In our review, a majority of cases had objects retained within the rectum; the rest were located in the sigmoid colon. Fifty-five percent of patients (6/11) presenting with a foreign body in the sigmoid colon required operative intervention *vs*. 24 percent of patients (17/70) with objects in their rectum ($P = 0.04$). CONCLUSIONS: This is the largest single institution series of retained colorectal foreign bodies. Although foreign objects located in the sigmoid colon can be retrieved at the bedside, these cases are more likely to require operative intervention. [Key words: Foreign bodies; Colorectal; Treatment]

Often a topic of curiosity and humor, the earliest reported management of a retained rectal foreign body dates back to 16th century.[1,2] Although an uncommon complaint, patients with irretrievable colorectal foreign bodies present a management dilemma. Before the last two decades, a systematic approach to the treatment of these patients had not been described. This is likely because of the small size of the series published at that time.[3–11] More recently, several large series have been reported,[12–14] and treatment strategies have been developed to aid in the management of these patients.[15–17]

Even in experienced hands, the treatment of patients with retained colorectal foreign bodies can be challenging. Although most objects can be safely removed at the bedside, some patients require evaluation with foreign body removal in the operating room. Currently, there are no studies that specifically identify predictors of operative intervention in the management of retained colorectal foreign bodies. This prompted us to review our experience managing

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Correspondence to: Robert W. Beart, Jr., M.D., Department of Colorectal Surgery, Keck School of Medicine, University of Southern California, 1441 Eastlake Avenue, Suite 7418, Los Angeles, California 90033, e-mail: rbeart@usc.edu

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anally introduced colorectal foreign bodies at the Los Angeles County + USC Medical Center (LAC+USC). We hypothesized that criteria predictive of operative intervention can be determined. Objects retained for more than two days, larger than 10 cm, and those located proximal to the rectum are suspected to require higher rates of operative intervention.

METHODS

A review of emergency surgical consultation records from October of 1993 through October 2002 at Los Angeles County + University of Southern California General Hospital (LAC+USC) yielded 127 patients with the diagnosis of "rectal foreign body." Only cases of anally introduced foreign bodies for which a surgical consult was obtained were included in this review. Patients who had ingested foreign materials, had an object previously removed, or who had rectal trauma without a retained foreign body were excluded. We discovered 93 confirmed cases of anally introduced retained colorectal foreign bodies, of which 87 were first-time presentations. The medical records for these initial admissions to LAC+USC were systematically reviewed.

Patient demographics including age, gender, and race were collected. Date and time of admission to the hospital, methods used for bedside extraction, foreign body location, operative details (if applicable), and postextraction course also were recorded. Because radiographs were inconsistently performed, the location of the retained object was determined by physical examination or operative findings. When available, we also catalogued the type and size (<10 cm or >10 cm) of the retained foreign body as described after extraction. Time to presentation was determined by the number of hours the foreign body had been in place before arrival at our facility. Operative time was defined as the time between entering and exiting the operating room. Length of stay was the number of calendar days that the patient was present in the hospital; the day of admission counted as Day 1.

Statistical analysis was performed using the SPSS computing software (Version 10.0 for Windows). Proportions were analyzed using Fisher's exact and Pearson's chi-squared tests, whereas means were compared using the independent *t*-test. Statistical significance was determined as $P \leq 0.05$. Before conducting this review, approval was obtained from the University of Southern California Institutional Review Board.

RESULTS

Our 93 cases of retained colorectal foreign bodies occurred in 87 patients (85 males; mean age at time of presentation, 40 (range, 15–80) years). Fifty-three percent were Hispanic, 36 percent were white/non-Hispanic, and 9 percent were African-American. The median time to presentation from foreign body insertion was 24 hours (range, 2 hours to 15 days).

The most common presenting complaint was rectal foreign body (98.9 percent) followed by abdominal pain (49.4 percent). Only two patients presented with signs and symptoms of peritonitis. In both cases, the patient was taken to the operating room for an emergent laparotomy. Of the remaining 85 cases, the emergency medicine service attempted to remove the foreign body in 31 patients (36 percent) and was successful in 5 patients (16 percent). Of the 79 patients presenting to the surgical service with the foreign body still in place (1 patient left against medical advice), bedside extraction was attempted in 77 (97 percent) and was successful in 58 (75 percent).

When noted in the medical record, the most commonly performed successful bedside technique was digital manipulation. Other successful maneuvers included grasping with forceps, removal with rigid sigmoidoscopy, manipulation with a Foley catheter, and enema. Intravenous sedation was the most commonly reported bedside anesthetic, with local block and viscous Lidocaine being documented at a much lower rates.

Twenty-three cases were definitively managed in the operating room. Seventeen examinations under anesthesia (EUA) and eight exploratory laparotomies were performed. Of the patients undergoing an exploratory laparotomy, two initially underwent an attempted extraction with an EUA. Five of the exploratory laparotomies included creation of a colotomy for retrieval of the foreign body after failed attempts at "milking" the object into the rectum. The two cases that presented with peritonitis required repair of the injured colon/rectum with proximal diverting colostomy. In the remaining laparotomy, the surgical team was successful in maneuvering the foreign body distally, allowing for transanal extraction.

Table 1 compares the characteristics of the cases managed at the bedside and in the operating room in our review. The two groups did not significantly vary in terms of patient age or time to presentation. In addition, patients who waited longer than two days to present to the hospital did not have a significantly

Table 1.
Characteristics of Retained Colorectal Foreign Body Cases[a]

	Nonoperative Intervention (n = 64)	Operative Intervention (n = 23)	*P* Value
Age (yr)			
Mean (±SD)	40.5 (±13)	40.4 (±11)	0.97[b]
Median	38	39	
Time to presentation			
Mean (±SD) (days)	1.9 (±2.5)	1.5 (±1.6)	0.41[b]
Median (days)	1	1	
<2 days	45	18	
≥2 days	13	5	0.95[c]
Size of foreign body			
<10 cm	7	6	
>10 cm	18	8	0.35[c]
Length of stay (days)			
Mean (±SD)	1.8 (±0.8)	3.9 (±2.7)	0.001[b]
Median	2	3	
Location of FB			
Rectum (%)	53 (76)	17 (24)	
Sigmoid Colon (%)	5 (45)	6 (55)	0.04[b]

Data are means with standard deviations in parentheses or numbers with percentages in parentheses unless otherwise indicated.

[a]Data not available when totals do not equal 87 cases

[b]Independent *t*-test.

[c]Pearson's chi-squared test.

higher rate of operative intervention (29 *vs.* 28 percent; $P = 0.95$). With regard to foreign body size, large objects (>10 cm) were retrieved at the bedside at similar rates as smaller objects. The types of objects retrieved ranged from foods (6 percent), to containers (28 percent), to recreational items (35 percent), to other miscellaneous objects (28 percent). Not surprisingly, patients taken to the operating room had on average a four-day length of stay *vs.* two days in the nonoperative cases ($P = 0.001$).

In this review, the majority of foreign bodies were retrieved from the rectum (86 percent), whereas the rest were found in the sigmoid colon. In 26 percent of the operative cases and in 9 percent of nonoperative cases, the foreign body was located in the sigmoid colon ($P = 0.04$). The observed difference in the prevalence of a foreign body located in the sigmoid colon between operative and nonoperative cases was 17 percent (95 percent confidence interval, 0.1–38 percent). Fifty-five percent of patients presenting with a foreign body in the sigmoid colon required operative intervention *vs.* 24 percent of patients with objects in their rectum. After removal of the foreign body, 43 percent of the cases included a postextraction sigmoidoscopy. Overall, 43 percent had mucosal abrasions, 16 percent had mucosal lacerations, and 38 percent had no injury. The only postoperative complication was a single episode of ileus.

DISCUSSION

Retained colorectal foreign bodies are a frequent, although often underreported, problem. Because only patients with colon perforations and those unable or unwilling to retrieve the object from their rectum present to the hospital,[12] the true incidence of this dilemma is unknown. In this review, one patient per month presented to the surgical service at LAC+USC General Hospital with a retained colorectal foreign body. The most common presenting complaint was retained foreign body in the rectum. This is in contrast to previously reported studies in which patients often presented with obscure anal or abdominal pain, denying rectal introduction of a foreign body.[16] This may be explained in part by the relatively long delay in presentation seen in our facility (mean, 2 days). An increased prehospital duration could result in heightened anxiety and thus more forthrightness associated with the presenting condition.

Patients usually attempt to remove the foreign body before seeking medical advice,[13,18] and presumably patients having difficulty retrieving the object tend to report to the hospital. Although unsuccessful attempts at foreign body removal can result in longer duration of retention, we were unable to find an association between length of time the foreign body was present

and operative intervention. In contrast, others have suggested that for objects present longer than 24 hours lying proximal to the rectum, laparotomy should be considered as the primary method of extraction.[19] In our practice, only signs of peritonitis call for laparotomy as initial therapy.

In all but two patients presenting to the surgical service with a retained colorectal foreign body, bedside extraction was attempted. This was successful in 75 percent of cases, which compares favorably to the rates achieved in other institutions (60–61 percent).[14,16] For patients requiring operative intervention for retrieval of the foreign body, an EUA was most commonly performed. In 15 of 17 examinations performed, we successfully retrieved the object transanally. Of the eight cases requiring laparotomies, an additional foreign body was removed *via* the anus. Therefore, in the 87 cases reviewed, there were only 7 instances (8 percent) that required opening the bowel for treatment of a retained foreign body.

Although we were unable to find an association with foreign body size, objects in the sigmoid colon required operative intervention at rates higher than rectal foreign bodies ($P = 0.04$). In fact, foreign bodies located proximal to the rectum are 2.25 times as likely to require operative intervention (95 percent confidence interval, 1.1–4.4). When there is no urgent need for surgery, Barone *et al.*[14] recommend observation to allow foreign bodies to pass into the rectum for ready extraction. At this time, it is our practice to attempt bedside extraction on all patients with colorectal foreign bodies at the time of presentation. In our experience, almost three-quarters of time bedside extractions are successful, and even foreign bodies in the sigmoid colon are retrieved at the bedside 45 percent of the time.

Ooi *et al.*[20] and Cohen and Sackier[16] advocate sedating all patients with a colorectal foreign body for an attempt at bedside extraction. When unsuccessful, this is followed by an attempt at transanal extraction in the operating room. As a final option, a laparotomy is performed in the most difficult cases. Our practice closely resembles this algorithm (Fig. 1). However, Yaman *et al.*[17] advise first determining the location, shape, and consistency of the foreign body, and taking patients with high-lying, hard, or sharp-edged objects to the operating room without an attempt at bedside extraction. Although we found that objects in the sigmoid colon required operative intervention at significantly higher rates, we believe our success at bedside retrieval of these items should warrant an attempt before operative intervention.

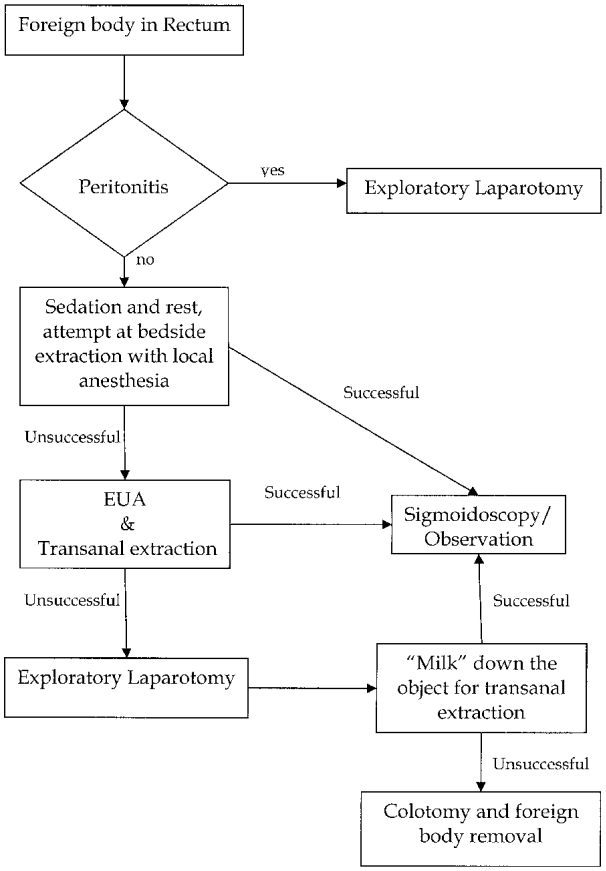

Figure 1. Treatment algorithm for retained colorectal foreign bodies.

Postextraction sigmoidoscopy is the best means of excluding injury to the distal bowel and determining the extent of injury when present. All published treatment strategies recommend postextraction sigmoidoscopy. At LAC+USC General Hospital, less than one-half of our reviewed cases include a documented sigmoidoscopy after extraction. Of these, only 16 percent revealed mucosal lacerations, and none of these patients had any postextraction complications. Our laceration rate may overestimate the true prevalence of injury, because sigmoidoscopies were likely performed in cases in which there was a higher suspicion of injury. Given this, significant injury after extraction of a colorectal foreign body is likely a rare finding.

CONCLUSIONS

It is a reluctant patient who presents to the hospital with a foreign body retained in his/her rectum. Although most foreign bodies can be removed *via* the

anus at the bedside with sedation, there is a population of patients who require operative intervention. We recommend an attempt at bedside extraction in all patients presenting with colorectal foreign bodies who have no signs of peritonitis. In unsuccessful cases, transanal extraction should be attempted in the operating room with local analgesia and sedation. For particularly difficult cases, a laparotomy should be performed to maneuver the foreign body into the rectum for transanal extraction. As a last resort, a colotomy should be made for retrieval of the foreign body. Although high-lying foreign bodies can be removed at the bedside, patients with foreign bodies located proximal to the rectum are significantly more likely to require treatment in the operating room.

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