

# Minimally invasive techniques as adjuncts in low- versus high-lying retained rectal foreign bodies of autoerotic nature in young men: a tailored management algorithm with two contrasting case reports from India

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Retained rectal foreign bodies (RFBs) of an autoerotic nature represent an emerging and rare surgical emergency, posing a sensitive challenge for surgeons. RFBs exhibit a wide range of presentations and require varied management approaches, with the choice of treatment modality differing from case to case. Recently, minimally invasive techniques have been employed for the retrieval of RFBs. In 2021, the World Society of Emergency Surgery and the American Association for the Surgery of Trauma released guidelines on anorectal emergencies, highlighting the usefulness of these techniques as adjunctive tools for both diagnosis and ruling out associated complications. In this report, we describe two noteworthy cases of men who presented to the trauma emergency department with foreign bodies lodged in their rectums. We also highlight the potential role of minimally invasive techniques within a “step-up” approach for the management of retained RFBs.

**Keywords:** Rectum; Foreign bodies; Acute care surgery; Injuries; Case reports

## INTRODUCTION

Retained rectal foreign bodies (RFBs) may result from voluntary or involuntary impalement, with sexual or nonsexual intentions. The incidence of RFBs in India is not documented in the available literature. However, a recent article drawing on data from the National Electronic Injury Surveillance System indicated an increase in the annual incidence of RFBs in the United States, from 1.2 per 100,000 persons in 2012 to 1.9 per 100,000 persons in 2021 [1].

Retained RFBs exhibit a wide range of presentations, which vary based on the circumstances leading to retention, the nature of the foreign body, and the duration of retention [2]. Sharp objects are typically associated with involuntary impalement, such as in cases of sexual assault. These instances usually present early and may be accompanied by complications such as perforation. Conversely, voluntary sexual impalement tends to involve blunt, rounded objects that may be situated higher within the rectum and are often uncomplicated, hence, tend to present late. Denial of self-insertion at the time of presentation can contribute to de-

layed diagnosis. While laparotomy is considered the gold standard for treatment, it is traditionally reserved for complicated cases. Minimally invasive techniques have emerged as an alternative to laparotomy for the retrieval of RFBs in uncomplicated cases [3]. These approaches also represent a useful adjunct for diagnosis or excluding complications, and in forming the definitive treatment modality [4]. In this report, we present two contrasting cases of retained RFB resulting from voluntary autoerotic activities in men who presented to the trauma emergency department. We discuss the classification, presentation, diagnosis, treatment, and outcomes of these cases.

## CASE REPORTS

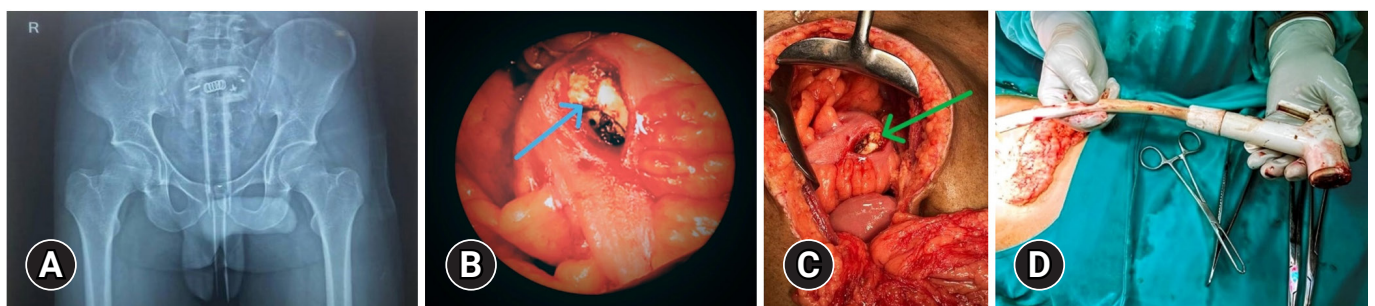
### Case 1

A 22-year-old unmarried male student presented with an alleged history of an accidental fall onto a lavatory faucet (jet spray), resulting in a retained RFB for the past 4 hours. He denied any engagement in autoerotic activities. The patient had been a tobacco user for 3 years. Upon arrival, his vital signs were stable, and abdominal examination revealed tenderness in the lower abdomen. The RFB was not detected on digital rectal examination (DRE). X-ray of the abdomen and pelvis confirmed the presence of a foreign body, with no free air visible under the diaphragm. After an unsuccessful attempt at transanal extraction, the patient underwent diagnostic laparoscopy. This procedure revealed a 2 × 3-cm contact perforation at the rectosigmoid junction without intraperitoneal contamination. As the foreign body was impacted at the rectosigmoid junction, the procedure was converted to open surgery through a small lower midline incision. The foreign body was successfully retrieved, and the perforation was primarily repaired. The patient was permitted to consume food orally on the third postoperative day and was discharged on the 6th day. He

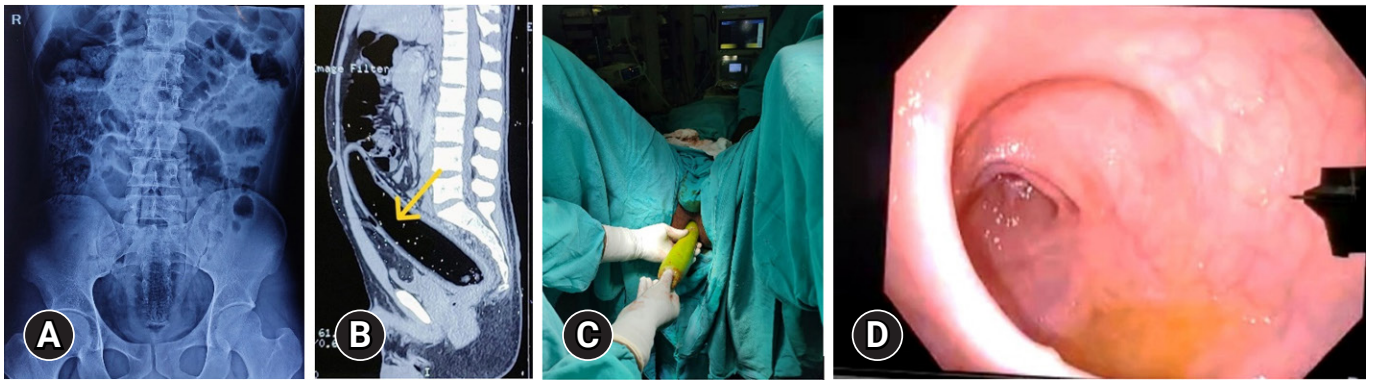
was advised to visit the psychiatry outpatient department for follow-up. In subsequent visits at 1, 3, and 6 weeks, the patient was doing well (Fig. 1).

### Case 2

A 23-year-old unmarried male student presented with an alleged history of falling onto a bottle gourd, or *lauki*, 3 hours prior and was unable to retrieve the object. He was experiencing tenesmus and intermittent colicky pain. The patient denied self-insertion or any prior autoerotic activity. He reported consuming alcohol three times a week, with one to two drinks per session. Clinical examination revealed a hard, well-defined tubular lump measuring 5 × 18 cm in the lower abdomen, extending to the umbilicus and right lumbar region, with the lower border reaching into the bony pelvis. On DRE, the anal tone was reduced, and the end of the RFB was palpable at the fingertip. Digital x-ray of the abdomen and pelvis indicated gaseous distension of bowel loops but no evidence of RFB or free air. Contrast-enhanced computed tomography (CECT) of the abdomen and pelvis showed a hypodense foreign body measuring approximately 6 × 40 cm in the rectosigmoid, with no evidence of extraluminal air. After informed consent was obtained, the RFB was successfully extracted transanally under general anesthesia, using gentle suprapubic and per-rectal manipulation. Intraoperative rectosigmoidoscopy revealed erythematous mucosa with a few superficial tears at the rectosigmoid junction, but no gangrenous patches or perforation. Consequently, the patient was allowed oral intake after 6 hours, which he tolerated well. He was discharged the following day with instructions to follow-up at the psychiatry outpatient department. At 1 and 6 weeks postdischarge, the patient was doing well (Fig. 2).



**Fig. 1.** Case 1 images. (A) Digital x-ray of the pelvis showing a foreign body (lavatory faucet). (B) Diagnostic laparoscopy revealing a 2×3-cm perforation (arrow) at the rectosigmoid junction. (C) Intraoperative image displaying a contact perforation (arrow) sealed by the foreign body, with no intraperitoneal contamination and an edematous, yet otherwise relatively healthy, rectosigmoid region. (D) Extracted rectal foreign body.



**Fig. 2.** Case 2 images. (A) Digital x-ray of the abdomen and pelvis showing a gaseous bowel loop but no foreign body. (B) Contrast-enhanced computed tomography of the abdomen and pelvis revealing a hypodense foreign body (arrow) measuring approximately 6×40 cm in the rectosigmoid, with no evidence of extraluminal air. (C) Transanal extraction of a retained rectal foreign body (bottle gourd) performed in the lithotomy position. (D) Rectosigmoidoscopy performed after retrieval of the rectal foreign body, showing no evidence of gangrenous patches or perforation.

### Ethics statement

This study was conducted in compliance with the principles of the Declaration of Helsinki. Written informed consents were obtained from the patients for publication of the research details and clinical images.

### DISCUSSION

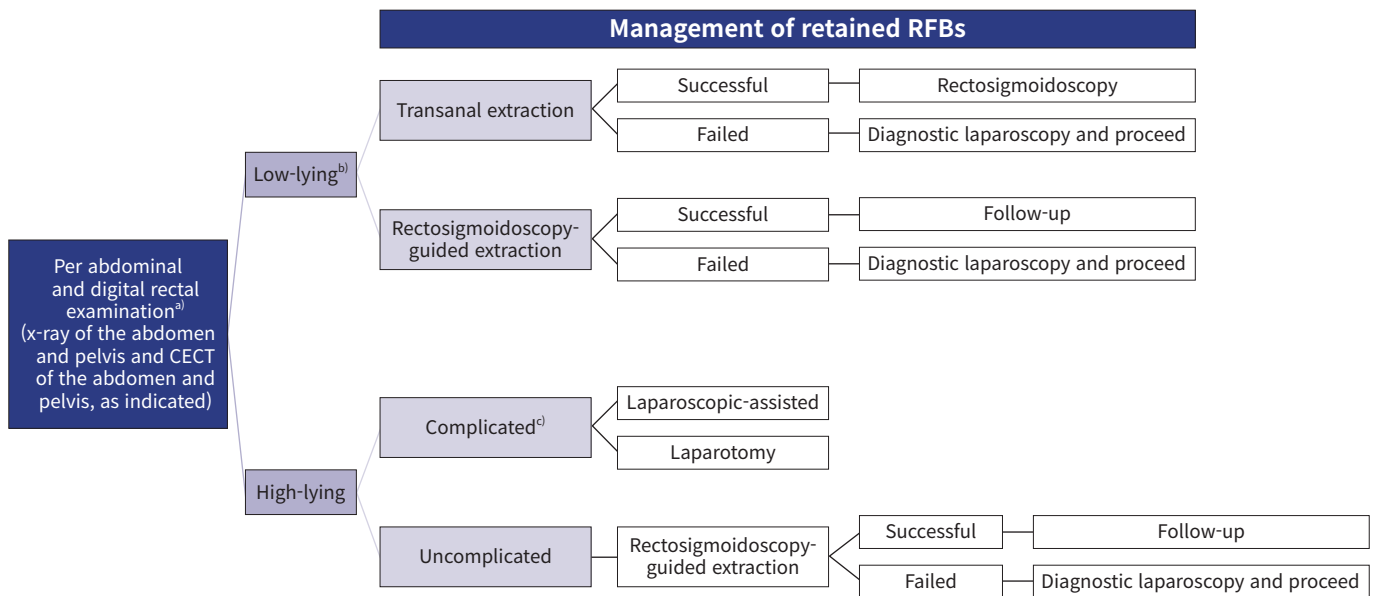
Suspicion of a misleading history should arise when the patient's report does not correlate with the mechanism leading to the presence of an RFB [5]. In such instances, fear of prejudice, discrimination, and associated stigma may delay presentation, potentially affecting outcomes. Establishing a controlled environment, emphasizing that the patient's privacy is respected and engaging in nonjudgmental conversation can help elicit the true story. Nevertheless, in most cases, the history is confirmed retrospectively. In our cases, the patients eventually admitted to engaging in similar autoerotic activities for the past 6 months and 1 month, respectively.

The importance of clinical examination in the detection of RFB is paramount. Small to medium high-lying RFBs may be detected as palpable abdominal lumps, while smaller, low-lying RFBs can be felt during rectal examination. Large RFBs may be palpable bimanually. Clinicians should maintain a low threshold for performing DRE, which is particularly useful for distinguishing between low- and high-lying RFBs based on whether the tip of the examining finger can reach the end of the RFB. This distinction is clinically meaningful, as low-lying RFBs are often amenable to transanal retrieval, whether by manual manipulation, digital or instrumental extraction, or rectosigmoidoscopy.

Conversely, high-lying RFBs are frequently associated with complications that may preclude transanal extraction or render it unsuccessful [6].

Imaging is utilized to identify a foreign body, determine its position, and reveal any complications. CECT of the abdomen and pelvis demonstrates a comparatively high sensitivity for detecting retained foreign bodies, including radiolucent objects [7]. Although digital x-ray is recommended as the initial investigation conducted in 2021 by the World Society of Emergency Surgery (WSES) and the American Association for the Surgery of Trauma (AAST), it may fail to detect nonopaque foreign bodies and perforations, particularly if the perforation is sealed by the impacted RFB. Transanal extraction in these cases may cause the perforation to be overlooked, delaying definitive treatment. This oversight can lead to an increased length of hospitalization, higher readmission rates, greater cost burden, and additional morbidities.

Regarding the most appropriate modality for RFB retrieval, the 2021 WSES-AAST guidelines recommend bedside extraction as the first-line therapy for low-lying retained RFBs without signs of perforation. However, the success of transanal extraction hinges on relaxed pelvic muscles and sphincters, which require adequate analgesia and may not be feasible at the bedside. Techniques such as pudendal nerve block, spinal anesthesia, intravenous conscious sedation, or general anesthesia can be employed to improve the likelihood of successful transanal retrieval. The available literature does not provide sufficient evidence to recommend one transanal extraction technique over another. For high-lying RFBs, endoscopic extraction is advised as the initial therapy. These recommendations are considered weak (grade



**Fig. 3.** Step-up approach in the management of retained rectal foreign bodies (RFBs). CECT, contrast-enhanced computed tomography. <sup>a</sup>Digital rectal examination should be avoided in cases of sharp foreign bodies, although such bodies are extremely rare among retained RFBs of an autoerotic nature. <sup>b</sup>Low-lying retained RFBs with complications should be managed in the same manner as high-lying complicated retained RFBs. <sup>c</sup>Complicated cases are those presenting with perforation, obstruction, or active bleeding accompanied by hemodynamic instability.

2C). The only strong recommendation (grade 1C) applies to patients exhibiting hemodynamic instability or perforation, in which case transanal extraction is contraindicated [4].

A “step-up” surgical approach is recommended when transanal extraction fails, beginning with downward milking and advancing to colotomy only if milking and transanal extraction are unsuccessful. A laparoscopic approach is preferred when feasible. If an associated perforation is present with limited contamination and the colorectal tissue is relatively healthy and well-vascularized, tension-free primary suturing is advised (grade 2C). For clinically stable patients without risk factors for anastomotic leakage and for whom primary suturing is not an option, the preferred treatments are resection and anastomosis, with or without a diverting stoma. However, in critically ill patients with bowel perforation, as well as select patients with extensive peritoneal contamination and risk factors for anastomotic leakage, the Hartmann procedure is recommended (grade 2C). In cases of hemodynamic instability, the WSES-AAST guidelines strongly advise emergent laparotomy and a damage control surgical approach (grade 1B) [4].

Minimally invasive techniques, including laparoscopy and endoscopy, can be useful for the timely detection of complications and to guide definitive management. This was demonstrated by our first case, in which diagnostic laparoscopy revealed a contact perforation. These techniques are also beneficial in transanal ex-

traction to ensure the integrity of the rectosigmoid, as shown in our second case. Consequently, we propose an algorithm for the management of retained RFBs, illustrated in Fig. 3.

Specifically, the varying characteristics of RFBs can complicate the treatment approach. Our simplified step-up algorithm (Fig. 3) can be used to tailor the treatment modality. In addition to the retrieval of RFBs, behavioral change communication plays a pivotal role in preventing future incidents, which could be life-threatening. Follow-up depends on the definitive management strategy and any complications that may arise.

In conclusion, retained RFBs present a sensitive surgical challenge. Respecting patient privacy and engaging in nonjudgmental dialogue are crucial for early diagnosis. CECT of the abdomen and pelvis is recommended for identifying hypodense foreign bodies. Current guidelines for formulating a tailored approach to RFB management remain ambiguous; thus, we propose a step-up algorithm to address this issue. Additionally, we highlight the potential benefits of minimally invasive techniques, such as laparoscopy and endoscopy, as adjunctive interventions.

## ARTICLE INFORMATION

### Author contributions

Conceptualization: SKG, SKB; Methodology: SPM, SS, VKK; Visualization: SPM, SKB; Writing—original draft: SKG; Writing—re-

view & editing: all authors. All authors read and approved the final manuscript.

### Conflicts of interest

The authors have no conflicts of interest to declare.

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### Data availability

Data sharing is not applicable as no new data were created or analyzed in this study

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