Innovations in Pharmaceutical Sciences & Care
Volume 1, Issue 1

Rapunzel Syndrome with Unusual Gastrointestinal Extension (Into Gallbladder): A Case Report

[1]*Hawra Abdullah
[1]Aljaber Hospital, Alahsa, Saudi Arabia.

Abstract

Rapunzel syndrome is a rare form of trichobezoar in which a gastric hair mass extends beyond the pylorus, potentially causing obstruction and serious complications, whereas gallbladder involvement is exceptionally uncommon. This report described a unique pediatric case of Rapunzel syndrome with jejunal and gallbladder extension and highlighted diagnostic and management considerations. A 12-year-old girl with a four-year history of trichotillomania and trichophagia presented with two weeks of abdominal pain, nausea, vomiting, progressive distension, early satiety and weight loss. Examination revealed a palpable epigastric mass and patchy alopecia; however, laboratory studies showed mild anaemia. Further, abdominal ultrasonography demonstrated an intragastric echogenic mass with duodenal extension and echogenic material within the gallbladder. Computed tomography confirmed a large gastric trichobezoar extending into the jejunum with gallbladder involvement, without perforation. The patient underwent exploratory laparotomy with gastrotomy and cholecystotomy, achieving complete removal. Recovery was uneventful, and psychiatric follow-up was initiated to prevent recurrence. This case underscores the need for early imaging to define atypical extensions and supports definitive surgical management combined with multidisciplinary recurrence-prevention strategies.

Keywords: Rapunzel syndrome, trichobezoar, gallbladder involvement, pediatric gastrointestinal obstruction, trichotillomania, surgical management.

Introduction

A trichobezoar represents a dense concretion of ingested hair localised within the gastrointestinal tract. When a gastric trichobezoar develops a long tail that migrates through the pylorus into the small intestine, the condition is classified as Rapunzel syndrome. This rare entity primarily affects children and adolescents, exhibiting a marked female predominance. It is frequently linked to underlying psychiatric disorders, specifically trichotillomania, the compulsive urge to pull out hair and trichophagia, the subsequent ingestion of that hair (Garg, 2025; Liang et al., 2024; Sacco et al., 2024). Furthermore, while adolescents are most commonly affected, uncommon cases have also been documented across a broad age range, including very young children and even neonatal patients (Liang et al., 2024).

Anatomically, these hairballs typically occupy the stomach with frequent extension through the pyloric sphincter into the duodenum and proximal jejunum (Malviya et al., 2024; Wang et al., 2023). The physical presence of such a large foreign body may precipitate severe complications, including gastric outlet obstruction, mechanical intestinal blockage, mucosal ulceration, haemorrhage, or transmural perforation (Ballinger et al., 2024; Belhadj et al., 2023; Zyla & Jacques, 2023). Although rare reports described extension further into the distal small bowel, gallbladder involvement remains conspicuously absent from traditional clinical descriptions. Such biliary participation is considered exceedingly atypical and does not align with established anatomical patterns of the syndrome itself (Refai et al., 2025; Sacco et al., 2024).

Diagnostic efforts are frequently delayed by a nonspecific clinical presentation, often resulting in significant clinical delays in identification (Garg, 2025; Patil et al., 2024). However, the presence of a palpable abdominal mass combined with a known history of behavioural hair-pulling serves as a vital diagnostic indicator. Radiographic evaluation is mandatory, ultrasonography is a successful initial screening method, and computed tomography provides a better overview of the longitudinal size of the bezoar and allows identifying accompanying complications (Wang et al., 2024).

Hawra Abdullah
Aljaber Hospital, Alahsa, Saudi Arabia.
Email: H.Abdullah321@gmail.com

Management strategies depend on the bezoar size and the presence of acute symptoms. Endoscopic retrieval is generally restricted to small, accessible bezoars. Conversely, surgical intervention remains the gold standard for treating voluminous or complicated Rapunzel syndrome (Al-Darwish et al., 2025). Permanent success necessitates mandatory psychiatric consultation to address the root behavioural cause and mitigate the risk of recurrence (Liang et al., 2024). The current report described a unique pediatric case of Rapunzel syndrome featuring unusual jejunal and gallbladder extension, aimed to discuss diagnostic considerations, surgical management and long-term recurrence-prevention strategies.

Case presentation

The patient was a 12-year-old female student of South Asian descent who presented for evaluation of abdominal complaints. Her medical background was significant for a four-year history of trichotillomania and trichophagia, which began at the age of eight. She had no history of prior gastrointestinal surgery and her family history was non-contributory regarding gastrointestinal or psychiatric disorders. Furthermore, there were no known drug or food allergies recorded. These demographic and psychiatric characteristics were consistent with the typical risk profile associated with Rapunzel syndrome.

Admission to the Emergency Department occurred following a referral from her primary care physician. A history of two weeks of generalised abdominal pain, with nausea and occasional vomiting was reported. She was experiencing progressive abdominal distension for five days before admission. The related symptoms were lack of appetite and satiety, which later resulted in a weight loss of about 3kg in the last month. Moreover, the parents reported a long-standing habit of hair ingestion, with no associated fever or jaundice on review of systems.

Physical Examination

Upon examination, the patient appeared alert and slender with clinical signs of mild pallor and minor dehydration. Her vital signs were stable, with a temperature of 36.9°C, blood pressure of 100/60 mmHg, a heart rate of 98 beats per minute, a respiratory rate of 20 per minute and an oxygen saturation of 98% on room air. Abdominal inspection revealed upper abdominal distension. Palpation revealed a hard, nontender, mobile assessment in the epigastrium that had a lateral extension into the right hypochondrium. Additionally, percussion over the mass demonstrated relative dullness. Bowel sounds were audible and normal and dermatological examination showed patchy alopecia on the scalp. The patient displayed an anxious effect and admitted to a persistent urge to pull her hair.

Initial Clinical Investigations

The hematologic test revealed mild anemia that had a haemoglobin level of 11 g/dL. Inflammatory markers were average, as the white blood cell count and C-reactive protein levels were within normal range. Similarly, the number of platelets was within normal ranges. Hepatic function tests, including transaminases and bilirubin, showed no abnormalities and serum electrolytes were balanced. Detailed laboratory parameters are provided in Table 1.

Table 1. Laboratory tests at admission

Test	Result	Reference Range	Interpretation
CBC	Hb: 11 g/dL, WBC: 8,500/µL, Platelets: 280,000/µL	Hb: 12–16, WBC: 4–11 ×10³, Platelets: 150–450 ×10³	Mild anaemia; otherwise, normal
LFTs	ALT: 28 U/L, AST: 32 U/L, ALP: 180 U/L, Bilirubin: 0.9 mg/dL	Normal	Liver function normal
Electrolytes	Na: 138 mmol/L, K: 3.9 mmol/L, Cl: 102 mmol/L	Normal	Normal
CRP	4 mg/L	<5 mg/L	No acute inflammation

Diagnosis

Initial abdominal ultrasound has revealed a hyperechoic intragastric mass, which seemed to be extended into the duodenum (Figure 1). Unusually, the sonographic examination also identified a hyperechoic form of the material in the lumen of the gallbladder. Subsequent evaluation via computed tomography (CT) of the abdomen confirmed the presence of a large, heterogeneous gastric

trichobezoar with a distinct tail extending through the pylorus into the jejunum. Similarly, a CT scan also presented the expansion of bezoar substance to the gallbladder along with a mild case of gastric distension, but showed no pneumoperitoneum or perforation, as shown in Figure 2. Moreover, CT delineated the longitudinal extent and informed operative planning, including anticipated jejunal and biliary extraction. An abdominal X-ray performed before the CT showed nonspecific gastric distension. Differential considerations were formulated based on these radiological features, as shown in Table 2.

Table 2. Imaging studies and impressions

Modality	Findings	Impression
Ultrasound Abdomen	Hyperechoic intragastric mass extending into the duodenum; hyperechoic material in the gallbladder	Suggestive of trichobezoar with unusual gallbladder extension
CT Abdomen	Large gastric trichobezoar with tail extending into the jejunum and gallbladder; mild gastric distension; no perforation	Confirms diagnosis and extent
X-ray Abdomen	Non-specific soft tissue mass; gastric outline distended	Supports obstruction diagnosis

Figure 1. Abdominal Ultrasound (Trichobezoar)
(Source: Author)

Based on the typical radiologic presentation and the reported history of trichophagia, the ultimate diagnosis was Rapunzel syndrome, which was rarely lateralized to the jejunum and gallbladder. Other diagnoses, such as phytobezoar, were considered due to the heterogeneous intraluminal mass with a mottled gas pattern, while gallstones and gastrointestinal tumours were omitted based on the detailed texture and continuity of the intraluminal material observed on CT.

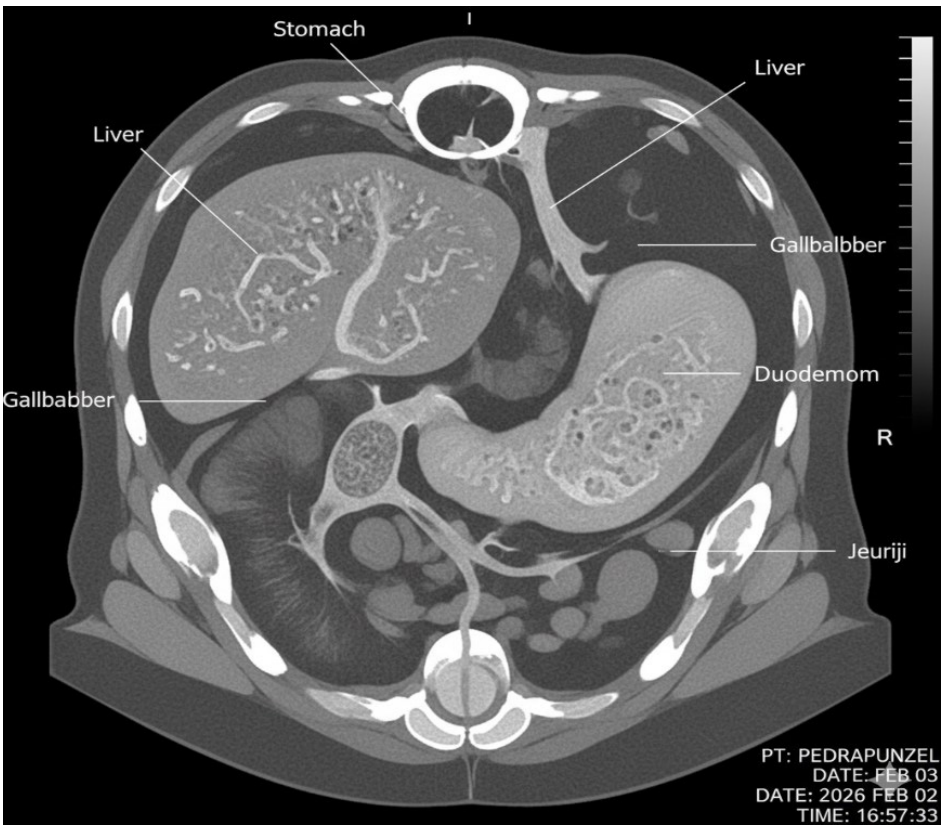

Figure 2. CT Abdomen (Rapunzel Syndrome with Gallbladder Extension)
(Source: Author)

Preoperative Management

Immediate management included the resuscitation of the patient by administering intravenous fluids under the goal of correcting the dehydration condition and careful monitoring of the electrolyte levels. Nasogastric decompression was activated with the aim of reducing gastric distension. Consequently, pediatric psychiatry was consulted early to treat the underlying impulse control disorder. Considering the enormous size of the trichobezoar and its spread to the biliary tree, the operation was considered an alternative to endoscopy.

Treatment Plan and Management

The patient underwent an exploratory laparotomy. A gastrotomy was performed on the anterior stomach wall to access the mass. The surgical team executed a sequential extraction, beginning with the large gastric trichobezoar. Following this, the tail was carefully retracted from the duodenum and jejunum. A cholecystotomy was performed and bezoar material was extracted. Intraoperative inspection revealed mild mucosal ulceration at the site of the gastric mass, but no evidence of perforation or necrosis was found (Figure 4).

Postoperative Care and Medications

The postoperative management involved ceftriaxone at a dose of 50 mg/kg/day for five days for infection prophylaxis, along with paracetamol administered at 15 mg/kg every six hours for five days for analgesia. The regimen included broad-spectrum antibiotics and regular analgesics to ensure comfort and prevent surgical site infection. Oral feeding was reintroduced gradually, starting on postoperative day three, alongside the initiation of behavioural therapy. Laxatives were prescribed to be administered as needed. Table 3 shows postoperative medications and protocols.

Hospital Course

The patient demonstrated a stable recovery trajectory from postoperative day one through day five. The management of pain was well achieved and intravenous hydration was also maintained during the initial period of operation. By the fifth day after the operation, the peristalsis had recovered, allowing oral liquids to be introduced.

Figure 4. Intraoperative Gallbladder Bezoar Extraction

Table 3. Medications post-surgery

Medication	Dose	Duration	Purpose
Paracetamol	15 mg/kg q6h	5 days	Pain control
Ceftriaxone	50 mg/kg/day IV	5 days	Prevent infection
Behavioral therapy	N/A	Ongoing	Prevent recurrence
Laxatives	Lactulose 1 mL/kg	As needed	Bowel regulation

On day four, the diet was advanced and the patient was ambulating independently. She met all clinical criteria for discharge on day five.

Discharge Plan

Discharge instructions precluded the use of oral medications. The primary focus of the discharge plan was the continuation of behavioural therapy to address trichotillomania. The patient and her family received extensive counselling regarding dietary habits and strategies to prevent recurrence. A coordinated follow-up schedule was established, involving both the pediatric surgery and psychiatry departments, with instructions to seek medical attention for recurrent abdominal pain or vomiting.

Follow-Up and Outcomes

Follow-up appointments with the psychiatrist were scheduled every week in the first month and then every two weeks every month. Following a one-week evaluation period, the surgical wound had healed satisfactorily and the patient had no symptoms. At the one-month follow-up, she was found to comply with the psychiatric intervention protocol and there were no signs of relapse. At three months, the patient had regained weight, reported no gastrointestinal symptoms and maintained excellent overall health.

Discussion

Rapunzel syndrome is an infrequent but grave manifestation of trichobezoars in the pediatric population. The clinical course in the pediatric environment is often marked by a high level of morbidity due to the presence of chronic mechanical obstruction of the gastric outlet or the proximal small intestine (Liang et al., 2024). Repetitive consumption of keratinous food, including hair, brings about the formation of a large, ulcerative mass, which could trigger mucosal rupture, pressurised necrosis, or

perforation (Ballinger et al., 2024; Belhadj et al., 2023). Nutritional compromise is often a resultant outcome of the space-occupying bezoar, in terms of restriction of caloric intake and nutrient absorption. The prototypical presentation anatomically is represented by a dominant gastric mass with an extension trailing behind this balance of the mass, going through the duodenum and further into the distal small bowel (Malviya et al., 2024).

Anatomically, the presence of a gallbladder complicates the presentation with different diagnostic and surgical issues, which cannot be incorporated in usual management algorithms (Refai et al., 2025; Sacco et al., 2024). These abnormal extensions make the diagnostic and surgical process more complicated and thus require an extensive exploration of the lumen, extending beyond the essential gastrointestinal lumen to ensure a complete removal of all the foreign bodies.

Furthermore, the process of such unusual extensions into the gallbladder seems to be linked to the sequential extension and relocation of the bezoar tail (Garg, 2025; Patil et al., 2024). In distal migration, the individual strands can work into the biliary orifice and this serves as a foci point to further build up. Figure 5 illustrates a suggested expansion route by which the gastrointestinal peristalsis moves flexible entities into constricted anatomical pathways (Sacco et al., 2024).

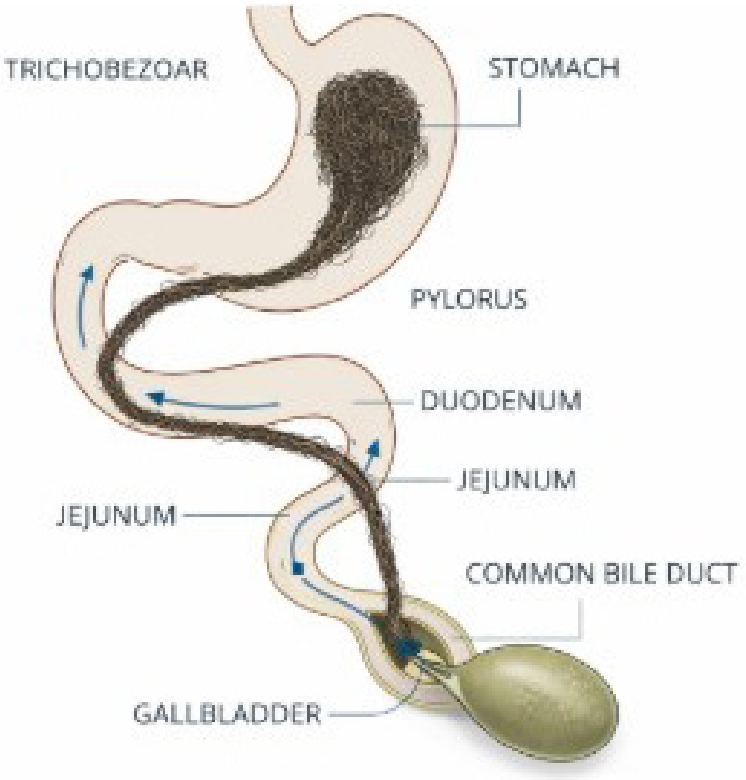

Figure 5. Schematic Diagram of Rapunzel Syndrome Extension
(Source: Author)

Consequently, delayed diagnosis contributes to disease progression and increased complication rates (Malviya et al., 2024). Imaging plays a pivotal role, with ultrasonography serving as a valuable screening tool for detecting intragastric masses (Wang et al., 2024). Computed tomography remains the definitive diagnostic modality for the comprehensive mapping of the bezoar's full anatomical extent. It provides essential visualisation of tail extensions and is indispensable for excluding complications such as perforation, thereby guiding preoperative planning and preventing incomplete extraction (Sacco et al., 2024). Optimal management strategies depend heavily on the total size and anatomical location of the hair mass. Operative intervention would help with full resection and analysis of the surrounding anatomy in situations where complicated or unusual anatomy has been found, especially in situations where endoscopic operation was contraindicated due to a heavy hair load (Al-Darwish et al., 2025).

In addition to biliary involvement, Rapunzel syndrome is also associated with a diverse range of rare and potentially

life-threatening secondary complications, which further compound the heterogeneous and unpredictable nature of the disease. The presence of atypical manifestations complicated by acute pancreatitis is reported, which is explained by mechanical compression or inflammatory extension immediately preceding the ampullary area, thus demonstrating the possibility of pancreaticobiliary impairment even despite the absence of direct involvement of the gallbladder (Alsarhan et al.).

Moreover, long tails of the bezoar have been identified as pathological lead points in the simultaneous, multifocal intussusception, which significantly increases the prevalence of severe intestinal obstruction and ischemic harm (Morey et al., 2025). From a clinical standpoint, the occurrence of bilious vomiting in pediatric patients warrants thorough investigation for uncommon obstructive etiologies, including bezoars, particularly when more prevalent causes have been systematically excluded (Pires et al.). Collectively, these atypical manifestations underscore the importance of heightened diagnostic vigilance and meticulous intraoperative exploration to minimise the risk of missed pathology and subsequent postoperative morbidity.

Simultaneously, long-term success necessitates a robust multidisciplinary approach. Early and consistent psychiatric intervention is essential to address the underlying behavioural drivers of trichotillomania and trichophagia, while nutritional support and family education are vital for preventing disease recurrence (Garg, 2025; Liang et al., 2024). There is a high-risk pediatric group (especially with comorbid psychiatric challenges) that should be put under the effects of early detection measures to mitigate morbidity (Sacco et al., 2024).

This case highlights the importance of keeping a high index of suspicion about Rapunzel syndrome in the patient with nonspecific gastrointestinal symptoms and a history of trichophagia or trichotillomania. Extensive disease should be suspected when abdominal distension or a palpable mass is present and early cross-sectional imaging should be given routinely to unmask reversible obstructive pathology. Recurrence remains a therapeutic challenge, with few alternatives to long-term psychiatric intervention and structured behavioural therapy. New techniques like minimally invasive or endoscopic-assisted approaches need confirmation before being advocated in everyday practice.

Patient Perspective

The positive prognosis and the elimination of gastrointestinal symptoms encouraged the patient and her family and the successful result of surgery. but was cautious of the risk of recurrence that might occur and underlined the necessity of consistent psychiatric follow-up and treatment of behavioural therapy.

Conclusion

This report highlights the clinical and treatment issues that are inherent to acute gastrointestinal obstruction caused by Rapunzel syndrome with atypical gallbladder extension. Conversely, the early detection of disease, the use of comprehensive treatment options and regular follow-up appointments are more likely to improve the chance of a quick recovery and, at the same time, minimise cases of recurrence and postoperative complications. These instances are used to strengthen the evidential foundation by underscoring patient-centred therapeutic interventions, therefore maximising the outcomes in similar clinical contexts.

Future Recommendations

Future research should continue to align epidemiological and clinical evidence with personalised patient care, which requires an extensive description of in-depth clinical cases in the following research.

Statements and Declarations

Informed Consent: Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Ethical Approval: This case report was conducted in accordance with the principles outlined in the Declaration of Helsinki. Since it is a single-patient case report, formal ethical approval was not required.

Acknowledgement: None

Funding: None

Data Availability: All data supporting the findings of this case report are contained within the manuscript.

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