

CASE REPORT

Rapunzel syndrome: a rare cause of hypoproteinaemia and review of literature

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SUMMARY

Rapunzel syndrome is an extremely rare condition associated with trichophagia (hair eating disorder) secondary to a psychiatric illness called trichotillomania (hair-pulling behaviour). It is most commonly seen in children and adolescents. Untreated cases can lead to a number of complications. We present a case of a middle-aged woman with sudden intractable vomiting and constipation associated with bilateral pedal oedema and significant weight loss. Laboratory investigations revealed low serum protein levels. Laparotomy was performed, and a hairball was removed from her stomach and ileum. The patient was managed with the help of a psychiatrist and was given nutritional support. We performed a comprehensive search and summarised data for a total of 88 cases. No time or language limit was placed. The purpose of this discussion is to highlight the clinical spectrum of Rapunzel syndrome and also to report its rare association with hypoproteinaemia.

BACKGROUND

Some psychiatric patients have an irresistible urge to pull out one's hair and have a sense of relief with the action. When these symptoms cannot be attributed to a secondary cause (like dermatitis or schizophrenia), it is termed as trichotillomania.¹ Its estimated incidence in the USA is ~1–4%.² Potential complications like trichophagia and trichobezoar occur in ~5–20% of these patients.³ About one-third of trichobezoar patients, in turn, develops Rapunzel syndrome, a condition in which the body of the hairball lies in the stomach, and its tail extends to the duodenum, ileum or all the way to the colon.⁴ The patient can present with nausea, vomiting, early satiety, altered bowel habits, abdominal distension, haematemesis and weight loss. It can rarely complicate into protein-losing enteropathy.⁵ Diagnosis is usually made by findings based on the clinical grounds and by laboratory and radiological findings like barium swallow and CT scan. Management classically involves surgical removal of the hairball, adequate diet and psychological management of the underlying cause.⁶

CASE PRESENTATION

A woman aged 38 years presented with nausea, vomiting and constipation for the last 2 days. She also had a gradual abdominal distension which started 2 weeks ago; it was progressively worsening. Vomitus was fecaloid and watery in consistency. She used to throw up everything that she tried to eat. She denied any fever, abdominal pain, melena,

haematemesis, haemoptysis or altered urinary habits. She had an unintentional weight loss of 15 pounds over the last 8 months along with a significant loss of appetite for the last 1 year. She had no previous psychiatric history and had never been hospitalised before.

On presentation, the patient was afebrile with a normal heart rate and blood pressure. She looked lethargic and had a pallor. Her weight was 150 pounds; her BMI was 22 and her free fat index percentage was 24%. Her abdomen was markedly distended with tympanic note. Bowel sounds were absent. There was no fluid thrill, shifting dullness, palpable visceromegaly or an abnormal mass on palpation. She also had a significant +3 bilateral pitting pedal oedema. However, there was no peri-orbital oedema. Cardiovascular, chest and neurological examination were unremarkable.

INVESTIGATIONS

Laboratory results revealed her haemoglobin level of 7.5 g/dL and MCV of 69 fL/red cell, with a normal platelet and white cell count. She had a low serum protein level of 6 g/dL and low serum albumin level of 2.5 g/dL. Her serum sodium level was 121 mEq/dL; serum potassium level was 2.5 mEq/dL. Her corrected serum calcium, Vit b12 and Vit D levels were within the normal range. Her renal and liver function tests were also within the normal limits. Her hepatitis serologies were negative, and her urinalysis was normal. Portable bedside abdominal X-ray showed dilated bowel loops with no visible haustrations. Owing to her worsening condition, additional diagnostic tests could not be performed.

DIFFERENTIAL DIAGNOSIS

On presentation, our suspicion was paralytic ileus and abdominal obstruction due to any abdominal mass or abdominal tuberculosis.

TREATMENT

The patient was resuscitated with intravenous fluids, and intravenous potassium was replaced. She received 2 units of packed red blood cells and one phial of albumin for symptomatic anaemia and hypoproteinaemia, respectively. She was kept 'nil per oral' in anticipation for abdominal surgery. On laparotomy, she was found to have a 15×10 cm hairball in the stomach (figure 1) with a small tail in the duodenum and a separate mass of hairball measuring 4×3 cm in the distal ileum (figure 2) both were removed with uneventful recovery.



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Figure 1 A large hairball measuring 15×10 cm removed from the stomach.



Figure 2 A small daughter hairball measuring 4×3 cm removed from the ileum.

OUTCOME AND FOLLOW-UP

The patient was discharged on her 6th postoperative day in a stable condition and was referred for psychiatric evaluation

along with plans for iron and nutritional supplementation. She was advised to take food high in proteins, eggs and chicken breast.

DISCUSSION

Rapunzel syndrome was named after the long-haired girl named Rapunzel, in Grimm brothers' fairy tale and was first described by Vaughan *et al.*⁷ It is associated with trichotillomania and trichophagia. It can complicate into bowel obstruction, bowel perforation, intestinal bleeding, multifactorial anaemia, weight loss, cholestatic jaundice, acute pancreatitis, appendicitis, intussusception and rarely into protein-losing enteropathy.⁶

We did a structured PubMed search and selected all cases of Rapunzel syndrome which were associated with complications.^{3–86} Review of all these 88 cases showed that complications commonly seen were weight loss, anaemia and intestinal obstruction in 26% (n=23), 17% (n=15) and 32% (n=28) patients, respectively. Fourteen per cent (n=12) of patients had obstruction due to intussusception. Six per cent (n=5) of patients had a gastric ulcer without perforation, 8% (n=7) patients had peritonitis due to perforation while 6% (n=5) patients had pancreatitis, jejunal perforation and stomach perforation each. Appendicitis, sepsis, gastric polyp and ileal perforation were seen in 2% (n=2) patients each. Other complications like duodenal perforation, cachexia, volvulus, gastric emphysema, nephrotic syndrome, gangrene and cholestasis were much less common and was seen only in 1% (n=1) patients each. Only one patient had hypoproteinaemia (protein-losing enteropathy) as a complication of Rapunzel syndrome.⁸

Common conditions associated with Rapunzel syndrome were depression 8% (n=7) patients, mental retardation 5% (n=4) patients and anxiety 3% (n=3) patients. Other patients were found to have adjustment disorder, Bulimia, pica, personality disorder and schizophrenia. The paediatric population had cerebral palsy history or child neglect. Stress factors like parental marital discord can also be a precipitating factor for Rapunzel syndrome.⁴

About 40% (n=35) patients were below the age of 10 years. Thirty-nine per cent (n=34) of patients were below the age of 20 years and 17% (n=15) patients were above the age of 20 but <30 years old. Only 3% (n=3) were above the age of 30 years. Out of all these patients, only 6% (n=5) patients were men. The characteristic findings of all these cases are detailed in [table 1](#).

Hypoproteinaemia secondary to Rapunzel syndrome occur due to the protein-losing enteropathy, or it may take place due to the malnutrition. In the case of protein-losing enteropathy, there is usually an associated blood loss per rectum which occasionally gives the symptoms of anaemia like easy fatigability, shortness of breath and pallor along with the pedal oedema. Patients with malnutrition usually present with a significant weight loss (BMI <18.5 or a low fat-free mass index <15) and they may have Vit D, Vit b12 and other mineral deficiencies as well.⁸⁷

Hossenbocus and Colin-Jones⁸ reported that protein-losing enteropathy was due to the hairball-induced mucosal erosion and ulceration. Lymphatic obstruction in the gut also results in protein leakage from dilated lymph vessels. Valberg *et al*⁵ suggest that bacterial overgrowth in the presence of bezoar interferes with albumin absorption. Stool an occult blood test may be positive along with low serum protein levels.¹⁷ The cause of anaemia can be iron deficiency, vitamin deficiencies or combination of both factors in addition to the blood loss. In our case, the possible cause of hypoproteinaemia was probably due to the direct effect of the hairball on the gut mucosa.

Table 1 Characteristic findings of previously reported cases of Rapunzel syndrome

Case no.	Author	Age/sex	Presentation	Location	Complication	Underlying condition	Intervention
1	Bouwer and Stein ³	25/F	Abdominal pain, nausea, vomiting	Stomach appendix	Appendicitis	Depression	Appendectomy
2	Frey <i>et al</i> ⁴	7/F	Pallor	Stomach, duodenum	Anaemia	Parental marital discord	Laparotomy
3	Naik <i>et al</i> ⁶	16/F	Abdominal pain	Stomach to ileum	Obstruction	Trichophagia	Laparotomy
4	Naik <i>et al</i> ⁶	18/F	Abdominal pain, vomiting	Stomach to mid ileum	Peritonitis	Trichophagia	Laparotomy
5	Naik <i>et al</i> ⁶	21/F	Abdominal pain, vomiting	Stomach to ileum	Peritonitis	Trichophagia	Laparotomy
6	Vaughan <i>et al</i> ⁷	15/F	No detail available	Jejunum to colon	Obstruction	NA	No detail available
7	Vaughan <i>et al</i> ⁷	13/F	No detail	Jejunum to ileocecal valve	Peritonitis	NA	No detail
8	Hossenbocus and Colin-Jones ⁸	20/M	Oedema of legs	Stomach, duodenum, oesophagus	Protein-losing enteropathy, gastric polyposis	Mental retardation	Laparotomy
9	Neychev <i>et al</i> ⁹	26/F	Nausea, constipation, abdominal discomfort	Oesophagus, stomach, duodenum	Chronic obstruction	Mental retardation	Laparotomy
10	Petrović <i>et al</i> ¹⁰	19/F	Abdominal pain, nausea, vomiting, heart burn	Stomach, duodenum	Weight loss, anaemia	Major depression	Laparotomy
11	Jones <i>et al</i> ¹¹	37/F	Abdominal pain, vomiting, nausea	Stomach, duodenum, ileum	Recurrent pancreatitis	Stress, anxiety	Laparotomy
12	Wadlington <i>et al</i> ¹²	30/F	Abdominal pain, vomiting	Duodenum, jejunum	Weight loss, jejunal ulcer	Bulimia	Laparotomy
13	Seker <i>et al</i> ¹³	6/F	Nausea vomiting	Stomach to caecum	Cachexia	Mental retardation	Laparotomy
14	Ventura <i>et al</i> ¹⁴	5/F	Cardiorespiratory arrest	Stomach and small bowel	Perforation of ileum, sepsis, death	Child neglect	Autopsy
15	Pul and Pul ¹⁵	12/F	Anorexia, vomiting, constipation	Stomach to the ileum	Perforation of stomach, weight loss	Depression	Laparotomy
16	Dalshaug <i>et al</i> ¹⁶	7/F	Abdominal pain, nausea, vomiting, diarrhoea	Jejunum, ileum, transverse colon	Intussusception	NA	Laparotomy
17	Sood <i>et al</i> ¹⁷	7/F	Abdominal mass	Stomach to the jejunum	Alopecia	NA	Laparotomy
18	Sood <i>et al</i> ¹⁷	6/F	Abdominal pain, vomiting	Stomach, duodenum	Intestinal obstruction	NA	Laparotomy
19	Gorter <i>et al</i> ¹⁸	9/F	Vomiting, palpable mass	Stomach, jejunum	Intussusception	Mental disturbance	Endoscopy
20	Tiwary <i>et al</i> ¹⁹	10/F	Epigastric pain, vomiting	Stomach to the jejunum	Anaemia, intestinal obstruction	NA	Laparotomy
21	Javora <i>et al</i> ²⁰	15/F	Abdominal pain	Stomach, duodenum	Peritonitis, gastric perforation	NA	Laparotomy
22	Bège <i>et al</i> ²¹	27/F	Abdominal pain	Stomach to jejunum	Obstruction	NA	Laparotomy
23	Crawley and Guillerman ²²	12/F	Abdominal pain	Duodenum, jejunum	Obstruction	Cerebral palsy	Laparotomy
24	Bashir <i>et al</i> ²³	8/F	Abdominal pain	Stomach to jejunum	Obstruction	NA	Laparotomy
25	Morales-Fuentes <i>et al</i> ²⁴	22/F	Abdominal pain, nausea vomiting	Stomach, small intestine	Anaemia, weight loss	NA	Laparotomy
26	Deslypere <i>et al</i> ²⁵	14/F	Nausea and vomiting	Stomach to colon	No detail available	NA	No detail available
27	Buyukunal <i>et al</i> ²⁶	5/F	No detail available	No details available	Sepsis	NA	No detail available
28	Wolfson <i>et al</i> ²⁷	5/F	No detail available	Stomach to caecum	Volvulus	NA	No detail available
29	Hassan and Panesar ²⁸	5/F	Epigastric pain, vomiting	Stomach to ileocecal valve	Jejunal perforation, Weight loss	NA	No detail available
30	Balik <i>et al</i> ²⁹	15/F	Abdominal pain, anorexia	Stomach to the jejunum	Obstruction	Trichophagia	Laparotomy
31	Duncan <i>et al</i> ³⁰	5/F	No detail available	Stomach to the ileocecal valve	Intussusception	Emotional stress	Laparotomy
32	Uroz <i>et al</i> ³¹	8/F	Vomiting, asthenia	Stomach to jejunum	Obstruction	NA	Laparotomy
33	Senapati and Subramanian ³²	8/F	Abdominal pain	Stomach to the jejunum	Haematemesis	NA	No detail available

Continued

Table 1 Continued

Case no.	Author	Age/sex	Presentation	Location	Complication	Underlying condition	Intervention
34	Singla <i>et al</i> ³³	9/F	Abdominal pain, abdominal lump	Stomach to the ileum	Weight loss	NA	Laparotomy
35	Kaspar <i>et al</i> ³⁴	12/F	Uncharacterised abdominal symptoms	Stomach to the ileum	Obstruction, weight loss	NA	Endoscopy followed by laparotomy
36	Faria <i>et al</i> ³⁵	7/F	Vomiting, abdominal pain, fever	Stomach to the jejunum	Peritonitis, jejunal perforation	NA	Laparotomy
37	Hirugade <i>et al</i> ³⁶	6/M	Vomiting, abdominal pain, abdominal lump	Stomach to the ileum	Weight loss	NA	Laparotomy
38	Couper ³⁷	4/F	Epigastric pain	Stomach to jejunum	Obstruction	NA	Laparotomy
39	Curioso <i>et al</i> ³⁸	22/F	Not available	No details	None	NA	No details
40	Klipfel <i>et al</i> ³⁹	14/F	Vomiting, abdominal pain	Stomach separate in terminal ileum	Gastric emphysema	NA	Laparotomy
41	Memon <i>et al</i> ⁴⁰	12/F	Abdominal pain, and lump	Stomach to the jejunum	Jejunal perforation	Emotional disorder	Laparotomy
42	Gockel <i>et al</i> ⁴¹	4/F	Abdominal pain	Stomach to the small intestine	Obstruction	NA	Endoscopy followed by laparotomy
43	Deevaguntla <i>et al</i> ⁴²	12/F	Abdominal pain, vomiting	Stomach to the distal small bowel	No detail available	NA	No detail available
44	Eryilmaz <i>et al</i> ⁴³	19/F	Abdominal pain, nausea, vomiting	Stomach to the small intestine	Ulcers, recurrent episodes	Depressive disorder	Laparotomy
45	Koushk Jalali <i>et al</i> ⁴⁴	17/F	Abdominal pain, vomiting, anorexia	Stomach, duodenum	Pancreatitis, weight loss	NA	Laparotomy
46	Chauhan <i>et al</i> ⁴⁵	19/F	Abdominal pain, vomiting, constipation, anorexia	Stomach, ileum	Weight loss	NA	Laparotomy
47	Flaherty <i>et al</i> ⁴⁶	15/F	Nausea, vomiting, early satiety	Oesophagus, stomach, duodenum	Intestinal obstruction	NA	Laparotomy
48	Sharma <i>et al</i> ⁴⁷	12/F	Vomiting, haematemesis, pallor	Stomach, duodenum	Stomach ulcer, anaemia, weight loss	NA	Laparotomy
49	Beristain-Silva <i>et al</i> ⁴⁸	10/F	Abdominal pain, nausea, vomiting	Stomach, small intestine	Weight loss, anaemia	Depression, anxiety	Laparotomy
50	Dixit <i>et al</i> ⁴⁹	20/F	Abdominal pain, abdominal lump, vomiting, anorexia	Stomach to jejunum	Chronic obstruction	Adjustment disorder	Laparotomy
51	Czerwińska <i>et al</i> ⁵⁰	16/F	Symptoms of ileus, epigastric mass	Stomach, duodenum, jejunum	NA	NA	Laparotomy
52	Athanasiau <i>et al</i> ⁵¹	15/F	Abdominal pain, vomiting, appetite loss	Stomach, duodenum, jejunum	Anaemia, gastric ulcer, weight loss	NA	Laparotomy
53	George <i>et al</i> ⁵²	28/F	Epigastric pain, vomiting	Stomach, jejunum	Obstruction	NA	Laparotomy
54	Andrade <i>et al</i> ⁵³	27/F	Abdominal pain, nausea, vomiting	Stomach, duodenum	Obstruction	NA	Laparotomy
55	Prasanna <i>et al</i> ⁵⁴	16/F	Abdominal pain, abdominal mass, vomiting	Stomach, duodenum, jejunum, ileum	Intussusception, anaemia	NA	Laparotomy
56	Kim and Nam ⁵⁵	8/F	Abdominal pain, abdominal mass, vomiting	Stomach to the jejunum	Obstruction	NA	Laparotomy
57	Dogra <i>et al</i> ⁵⁶	8/F	Abdominal pain, nausea, vomiting, constipation	Stomach, duodenum	Appendicitis, anaemia, weight loss	NA	Laparotomy
58	Dogra <i>et al</i> ⁵⁷	24/F	Abdominal pain, vomiting, constipation	Stomach jejunum	Anaemia	NA	Laparotomy
59	Singh <i>et al</i> ⁵⁸	5/F	Abdominal pain, vomiting, constipation	Stomach to ileum	Ileal perforation, anaemia, bleeding per rectum	NA	Laparotomy
60	Lopes <i>et al</i> ⁵⁹	22/F	Abdominal pain, vomiting	Stomach, duodenum, jejunum	Intussusception	NA	Laparotomy
61	Tayyem <i>et al</i> ⁶⁰	23/F	Abdominal pain, vomiting, haematemesis, constipation	Stomach, duodenum	Anaemia, peritonitis(perforated gastric ulcer)	NA	Laparotomy
62	Gonuguntla and Joshi ⁶¹	5/F	Abdominal pain, vomiting, early satiety, decrease appetite	Stomach, small gut	Obstruction	NA	Laparotomy
63	Dindyal <i>et al</i> ⁶²	55/M	Abdominal pain, fever, nausea, constipation	Stomach, duodenum	Intestinal obstruction, perforation	Schizophrenia	Laparotomy

Continued

Table 1 Continued

Case no.	Author	Age/sex	Presentation	Location	Complication	Underlying condition	Intervention
64	Emre <i>et al</i> ⁶³	18/M	Abdominal pain, nausea, vomiting	Stomach, small gut	Gastric ulcer	Mental retardation	Laparotomy
65	Rabie <i>et al</i> ⁶⁴	11/F	Abdominal mass, epigastric pain, vomiting	Stomach, jejunum	Gastric ulcer.	NA	Laparotomy
66	Rabie <i>et al</i> ⁶⁴	19/F	Abdominal pain, vomiting, constipation, abdominal distension	Stomach to the jejunum	Jejunal intussusception, jejunal perforation	Adjustment disorder	Laparotomy
67	Tamini <i>et al</i> ⁶⁵	46/F	Abdominal pain, vomiting, nausea	Stomach	Intestinal obstruction Weight loss	Psychosis	Laparotomy
68	Mnari <i>et al</i> ⁶⁶	7/F	Abdominal pain	Stomach to the jejunum	Intussusception, anaemia	NA	Laparotomy
69	Parakh <i>et al</i> ⁶⁷	18/F	Abdominal pain	Stomach, small gut	Gastric perforation	NA	Laparotomy
70	Marwah <i>et al</i> ⁶⁸	Young female	Abdominal pain, vomiting	Stomach, duodenum, jejunum	Jejunal intussusception	NA	Laparotomy
71	Meier and Furtwaengler ⁶⁹	7/F	Abdominal pain, abdominal mass, loose stools	Stomach, ileum	Obstruction	NA	Laparotomy
72	Umbetalina <i>et al</i> ⁷⁰	20/F	Vomiting, abdominal pain	Stomach, duodenum, jejunum	Nephrotic syndrome, hypercholesterolaemia, partial obstruction	NA	Laparotomy
73	Middleton <i>et al</i> ⁷¹	2.5/F	Abdominal pain, vomiting	Stomach to the small intestine	Intussusception	NA	Laparoscopy followed by laparotomy
74	Kohler <i>et al</i> ⁷²	9/M	Abdominal pain, vomiting, nausea	Stomach to the ileum	Pancreatitis, jejunal perforation, Intussusception	NA	Laparotomy
75	Aulagne <i>et al</i> ⁷³	2.8/F	Nausea, vomiting, abdominal mass, anorexia	Stomach, duodenum, jejunum	Anaemia, weight loss	NA	Laparotomy
76	Henry <i>et al</i> ⁷⁴	10/F	Epigastric pain, vomiting, constipation	Stomach to ileocecal region	Anaemia, obstruction, weight loss	Pica	Laparotomy
77	Mohite <i>et al</i> ⁷⁵	28/F	Abdominal pain, distension	Stomach, duodenum, jejunum	Gastric perforation, peritonitis	Depression	Laparotomy
78	Koç <i>et al</i> ⁷⁶	14/F	Abdominal pain	Stomach, duodenum	Gastric perforation, weight loss	NA	Laparotomy
79	Anzieta <i>et al</i> ⁷⁷	16/F	Vomiting, abdominal pain,	Stomach to the jejunum	Obstruction	Personality disorder	Laparotomy
80	Salem <i>et al</i> ⁷⁸	22/F	Epigastric pain, vomiting	stomach, duodenum	Pancreatitis, gangrene of duodenal jejunal junction	NA	Laparotomy
81	Kibria <i>et al</i> ⁷⁹	6/F	Abdominal pain, constipation	Stomach, duodenum	Intussusception, weight loss	Trichophagia	Laparotomy
82	Matějů <i>et al</i> ⁸⁰	3.10/F	LOC	Stomach to the jejunum	Weight loss, death	Child neglect	Autopsy
83	Cook <i>et al</i> ⁸¹	12/F	Vomiting, abdominal pain	Stomach to the jejunum	Weight loss, intussusception	NA	Laparotomy
84	Raikar <i>et al</i> ⁸²	12/F	Abdominal pain, vomiting	Stomach, duodenum	Obstruction	Depression	Laparotomy
85	Chogle <i>et al</i> ⁸³	3/F	Vomiting, jaundice, fever, abdominal pain	Stomach, duodenum	Cholestasis, weight loss	NA	Laparotomy
86	Dorn <i>et al</i> ⁸⁴	17/F	Epigastric pain	Stomach, duodenum	Weight loss	Non-specific anxiety disorder	Laparoscopy
87	Hoover <i>et al</i> ⁸⁵	9/F	Abdominal pain, vomiting, abdominal mass	Stomach, small intestine	Obstruction	NA	Laparoscopy followed by laparotomy
88	Alsafwah and Alzein ⁸⁶	29/F	Abdominal pain, tenderness, nausea, vomiting	Stomach, duodenum	Intestinal obstruction	NA	Endoscopy, laparotomy
89	This case	38/F	Nausea, vomiting, constipation	Stomach, duodenum and ileum	Hypoproteinaemia, abdominal distension	NA	Laparotomy

The fact that the hairball involved the ileum a site for protein absorption and microcytic hypochromic anaemia on peripheral smear supports our hypothesis. However, the possibility of low protein intake or poor absorption cannot be excluded as the patient had significant loss of appetite. Moreover, we could not confirm stool protein levels due to constipation.

Radiological imaging can be diagnostic; a plain X-ray of the abdomen can show dilated stomach. Barium swallow reveals a honeycomb-like enhancement in the gut.¹⁷ Similarly, ultrasound can be helpful which shows an increased echogenicity in the stomach.¹⁷ Small intestinal extensions of the hairball can be revealed on a CT scan as well.⁸⁸ Endoscopy enables direct visualisation and endoscopic biopsy and removal of hairs.

Surgical management depends on the presentation of the patient and size of the hairball. Complicated cases and those with a large hairball on radiological imaging need urgent surgical intervention.¹³ Similarly, patients with tense abdominal distension, tenderness and those who had an unsatisfactory response to the conservative treatment should be operated. During surgical removal of the hairball, the gastrointestinal tract should thoroughly be examined for the possibility of any additional mass. Small gastric hairballs, however, can safely be removed endoscopically.⁸⁵

Management of the complicated cases should be performed with a multidisciplinary approach involving dietician, nutritionist, psychiatrist, psychologist, general surgeon along with general practitioner. High-protein diet is recommended. Medium-chain triglycerides instead of long-chain triglyceride (LCT) are preferred as it bypasses the lymphatics and enters the portal system directly. Diet low in LCT also decreases further protein leakage.⁸⁹ Under the care of a psychiatrist to address the underlying psychiatric illness, behavioural and pharmacological therapies are the cornerstones to treat the cause and to prevent recurrent complications. Effective psychological therapies include habit-reversal therapy and stimulus control training, while commonly used medications are selective serotonin reuptake inhibitors, antipsychotics, tricyclic antidepressants and stimulants.⁹⁰ In our case, the management was focused on initial resuscitative measures, removal of the hairball and subsequent nutritional rehabilitation with high protein and low-fat diet.

Learning points

- ▶ Rapunzel syndrome should be considered, especially in female patients with physical findings like alopecia, anaemia, malnutrition and anaemia with an underlying psychiatric disorder and presenting with abdominal symptoms consistent with the clinical picture.
- ▶ Treatment can be tailored according to the presentation, radiological findings, but laparotomy is the standard of care, especially in acute and complicated cases to avoid complications ranging from mild anaemia to massive obstruction, perforation and even death.
- ▶ Physicians should also keep a high index of suspicion for its rare complication like hypoproteinaemia, especially when a patient has bilateral pedal oedema and condition requires use multidisciplinary approach for the treatment.

Contributors EA and KS wrote the case presentation, summary and background. WU and FA did literature review and wrote discussion.

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