

## Severe Post-Bariatric Kwashiorkor Syndrome: A Case Report

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### ABSTRACT

Kwashiorkor syndrome, classically associated with childhood malnutrition in low-income countries, has been increasingly recognized in adults, particularly following gastrointestinal surgeries that impair nutrient absorption, such as Roux-en-Y gastric bypass and pancreaticoduodenectomy. This report describes the case of a 43-year-old woman who developed severe protein-energy malnutrition after bariatric surgery, presenting with edema, skin changes, alopecia, and muscle weakness. The diagnosis was confirmed by hypoalbuminemia and other laboratory abnormalities. Treatment included electrolyte support, parenteral nutrition, and correction of nutritional deficiencies. Clinical improvement was observed following a multidisciplinary approach. Pathophysiologically, protein deficiency compromises oncotic pressure and tissue renewal, leading to edema and dermatological manifestations. Short bowel syndrome, often present in these patients, further exacerbates malabsorption. Effective management requires careful nutritional reintroduction, vitamin and mineral supplementation, and multidisciplinary follow-up. Prevention is based on dietary education, strict postoperative monitoring, and adherence to protein supplementation. Recent studies suggest a role for gut microbiota in Kwashiorkor pathophysiology, indicating potential benefits from probiotic use. This case underscores the importance of early clinical and laboratory surveillance in bariatric patients to prevent severe nutritional complications and improve clinical outcomes.

### Keywords:

Kwashiorkor, Bariatric surgery, Protein-energy malnutrition, Short bowel syndrome, Skin manifestations.

### Introduction

Kwashiorkor syndrome represents a severe form of protein-energy malnutrition, clinically characterized by symmetrical edema, abdominal distension, and skin changes, accompanied by markedly reduced serum albumin levels [1-3]. It has traditionally been observed in pediatric populations from developing countries, where low-protein diets and inadequate caloric intake contribute to its presentation [1,3]. However, in the past decade, adult cases have been increasingly recognized, especially in contexts of severe malabsorption, chronic diseases, or anatomical alterations of the gastrointestinal tract that compromise essential nutrient absorption [2,4]. Among the predisposing factors for secondary adult Kwashiorkor are surgical procedures that significantly alter digestive anatomy and function, such as Roux-en-Y gastric bypass and pancreaticoduodenectomy (Whipple procedure) [4,5]. In bariatric surgery, the reduction of gastric volume and rerouting of intestinal transit affect protein, fat-soluble vitamin, and

mineral digestion and absorption [4]. Patients with short bowel syndrome due to extensive intestinal resections present reduced absorptive surface, leading to protein, energy, and fluid-electrolyte deficiencies [6].

Early diagnosis of Kwashiorkor in postoperative adults requires a high index of suspicion. Symptoms such as lower limb and facial edema, paradoxical weight loss associated with fluid retention, and skin signs (xerotic skin, “cracked” desquamation, fine brittle hair) should be assessed alongside laboratory tests showing hypoalbuminemia and decreased total protein and micronutrient levels [2,7]. The clinical presentation can be insidious, often confused with other causes of edema, such as heart or kidney failure, highlighting the importance of detailed surgical and nutritional history [2]. Several case reports illustrate the challenge of nutritional management in patients undergoing gastric bypass and intestinal resections. One case described a 60-year-old patient who developed Kwashiorkor after gastric bypass and subsequent short bowel syndrome, presenting with generalized edema and severe hypoalbuminemia [8]. Another report described an adult male who, after pancreaticoduodenectomy, presented classic cutaneous signs of Kwashiorkor, such as cracked skin and

reddish-white hair discoloration [9]. These cases highlight the clinical heterogeneity and the need for multidisciplinary evaluation involving surgeons, gastroenterologists, nutritionists, and pharmacists [4,10].

Pathophysiologically, protein deficiency leads to decreased plasma oncotic pressure, promoting fluid leakage into interstitial spaces and resulting in edema [2]. Impaired absorption of essential amino acids compromises albumin synthesis and other plasma components, as well as tissue repair processes [2]. Recent studies suggest gut microbiota may modulate nutritional status, indicating that microbial imbalances associated with accelerated intestinal transit may exacerbate Kwashiorkor [11]. Preventive strategies in postoperative bariatric care should include rigorous monitoring of daily protein intake, periodic laboratory evaluation of albumin, total protein, vitamin, and mineral markers, and personalized nutritional guidance [4,7]. Educating patients on the need for five to six small, protein-rich meals per day and strict adherence to protein and vitamin supplements is essential to reduce the incidence of secondary Kwashiorkor [4].

## Objective

This report aims to describe a clinical case of Kwashiorkor in a young woman following Roux-en-Y gastric bypass surgery.

## Case Report

A 43-year-old female patient was admitted on November 18, 2024, reporting diarrhea, diffuse abdominal pain, and vomiting for the past year, following Roux-en-Y gastric bypass surgery. She also complained of myalgia, generalized weakness, bilateral lower limb edema, brittle nails, brittle hair, the appearance of skin spots, and skin peeling. The patient reported poor protein intake, stating that her diet consisted basically of water and salt crackers. On physical examination, the patient appeared in fair general condition, with edema in the lower limbs and face, diffusely darkened skin lesions, brittle nails, and hair loss. Pulmonary and cardiac auscultation showed no abnormalities. Laboratory tests revealed: hemoglobin 7.5 g/dL; hematocrit 21.7%; leukocytes 3,000/mm<sup>3</sup> without a left shift; vitamin D 19 ng/mL; TSH 4.37  $\mu$ IU/mL; free T4 0.96 ng/dL; ferritin 170 ng/mL; vitamin B12 >1,500 pg/mL; phosphorus 2.9 mg/dL; ionized calcium 6.7 mg/dL. Initial testing for *Clostridium difficile* was negative. The patient was evaluated by the hospital's nutrilogist and nutritionist, who decided to initiate electrolyte replacement, parenteral nutrition for six days, in addition to an oral diet with higher protein content, and albumin supplementation for two days. Endoscopy and colonoscopy were performed and showed mild chronic gastritis without activity at the anastomosis site with mucosa of pyloric pattern, and erosions in enteric-type mucosa. *Helicobacter pylori* testing was negative.

The patient showed significant improvement following these measures, including decreased frequency of vomiting and diarrhea, reduced edema, and improvement in brittle nails and dry skin appearance. However, after seven days of hospitalization, she presented persistent greenish diarrhea. A repeat *Clostridium difficile* test came back positive. She was treated with oral vancomycin for seven days. Oral electrolyte and protein supplementation were continued. On the seventh day of treatment, she reported only one episode of diarrhea per day

and no additional complaints. The patient was discharged with a prescription for oral metronidazole for another seven days, along with dietary guidance, a prescription for supplements such as isolated whey protein and creatine, and referrals for follow-up with a nutritionist and the internal medicine outpatient clinic. At follow-up, the patient reported persistent diarrheal stools, but only once daily. She also reported improvement in hair loss, brittle nails, and skin peeling. She indicated improved dietary intake and stated that she had started going for walks.

## Discussion

Reviewing various adult Kwashiorkor cases reveals interconnected risk factors, especially among individuals who have undergone abdominal surgeries impairing digestion and nutrient absorption [4,5]. Roux-en-Y bariatric surgery, widely used in treating morbid obesity, reduces gastric reservoir size and bypasses parts of the small intestine, causing malabsorption of proteins, calories, and micronutrients [4]. In patients with short bowel syndrome, absorptive capacity is further compromised, creating a scenario conducive to secondary Kwashiorkor [6]. In the first of two cases, a female post-gastric bypass patient had only 45 cm of functional small intestine, partial dependence on parenteral nutrition, and poor tolerance to nutritional intake, leading to severe hypoalbuminemia, anasarca, and deficiencies in copper, zinc, and fat-soluble vitamins [5,8]. The second case involved a male who developed typical skin changes after pancreaticoduodenectomy, including xerotic, cracked skin, emphasizing the critical role of pancreatic and duodenal function in pathogenesis [9].

Pathogenically, hypoalbuminemia explains the edema, while skin alterations result from impaired epidermal renewal and keratin synthesis, reflecting protein-energy and micronutrient deficiencies [2,9]. Anomalous pigment deposition and "moon face" features result from fluid retention and loss of subcutaneous tone, producing a rounded facial contour. Management of secondary Kwashiorkor must be cautious, beginning with slow and progressive reintroduction of high-biological-value proteins to avoid metabolic overload and hypofiltration. Supplementation with essential amino acids, along with correction of electrolytes and repletion of trace elements (copper, zinc) and fat-soluble vitamins, is crucial to restore nutritional balance. When necessary, parenteral nutrition must be customized in duration and composition to maximize absorption and reduce infection risk.

A multidisciplinary approach is essential: nutritionists develop individualized meal plans; pharmacists oversee parenteral nutrition formulations and supplementation; gastroenterologists assess malabsorption factors; and surgeons consider additional interventions to optimize intestinal transit. Reports indicate that standardized monitoring protocols including weekly weight, serum albumin, and fluid balance assessments significantly reduce recurrence and improve outcomes. Preventive strategies should include continuous patient education on the importance of at least 60 g/day of protein intake and the use of liquid or powdered supplements, particularly in the early postoperative months. Support groups and regular follow-ups improve treatment adherence, early symptom recognition, and timely intervention adjustments. Future research should explore the role of gut microbiota in secondary Kwashiorkor, as preliminary

studies suggest imbalances in beneficial bacteria worsen malabsorption and systemic inflammation factors potentially modifiable by probiotics and prebiotics. Controlled clinical trials are needed to validate these interventions and establish evidence-based protocols.

## Conclusion

The increasing reports of secondary Kwashiorkor in adults with anatomical alterations of the gastrointestinal tract challenge the notion that the syndrome is exclusive to childhood in poverty settings. Bariatric surgery, pancreaticoduodenectomy, and extensive resections create scenarios of severe malabsorption which, without proper support, progress to edema, hypoalbuminemia, and typical dermatoses. Early recognition of these signs reduces infections, organ failure, and mortality. Routine evaluation of albumin, total proteins, fat-soluble vitamins, and minerals should be standard practice in at-risk patients. Nutritional protocols ensuring a minimum protein intake of 1.5 g/kg/day, meal fractionation, oral or enteral supplementation, and timely use of parenteral nutrition help reduce complications and hospital costs. Therapeutic success requires a multidisciplinary team: surgeons adjust techniques; gastroenterologists monitor absorption; nutritionists tailor diets; pharmacists regulate micronutrients; psychologists reinforce adherence. Educational programs that explain the risks of protein deficiency, warning signs, and the importance of follow-up increase patient autonomy. Emerging evidence suggests that modulation of the gut microbiota with probiotics, prebiotics, or fecal transplantation may optimize amino acid absorption, offering a promising adjuvant approach, although robust clinical trials are still needed. Looking ahead, the integration of digital tools such as dietary tracking apps, telemonitoring of weight and edema, and artificial intelligence alert algorithms will facilitate early detection of Kwashiorkor and personalize interventions. In conclusion, addressing this severe form of malnutrition requires systematic surveillance from surgical planning through the late postoperative period, combining evidence-based protocols, laboratory monitoring, and patient empowerment. Only then will it be possible to reduce morbidity, improve quality of life, and ensure long-term metabolic safety for these individuals.

## Conflict of Interest

The authors declared no conflict of interest.

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## References

1. Bhutta ZA, Berkley JA, Bandsma RHJ, et al. Severe childhood malnutrition. *Nat Rev Dis Primers.* 2017;3:17067.
2. Jensen GL, Mirtallo J, Compher C, et al. Adult starvation and disease-related malnutrition: a proposal for etiology-based diagnosis in the clinical practice setting from the International Consensus Guideline Committee. *JPEN J Parenter Enteral Nutr.* 2010;34(2):156-159.
3. World Health Organization. *Management of severe malnutrition: a manual for physicians and other senior health workers.* Geneva: WHO, 1999.
4. Lupoli R, Lembo E, Saldalamacchia G, et al. Bariatric surgery and long-term nutritional issues. *World J Diabetes.* 2017;8(11):464-474.
5. William JH, Tapper EB, Yee EU, et al. Secondary kwashiorkor: a rare complication of gastric bypass surgery. *Am J Med.* 2015;128(5):e1-e2.
6. Thompson JS, Weseman R, Rochling FA, et al. Current management of the short bowel syndrome. *Surg Clin North Am.* 2011;91(3):493-510.
7. Cederholm T, Bosaeus I, Barazzoni R, et al. Diagnostic criteria for malnutrition - An ESPEN Consensus Statement. *Clin Nutr.* 2015;34(3):335-340.
8. Custer A, Custer D, Shao P, et al. Secondary Kwashiorkor Disease in a Patient with Gastric Bypass Surgery and Short Gut Syndrome. *Am J Case Rep.* 2021;22:e928468.
9. Mann D, Presotto C, Queen SM, et al. Cutaneous manifestations of kwashiorkor: a case report of an adult man after abdominal surgery. *An Bras Dermatol.* 2011;86(6):1174-1177.
10. DiBaise JK, Matarese LE, Messing B, et al. Strategies for parenteral nutrition weaning in adult patients with short bowel syndrome. *J Clin Gastroenterol.* 2006;40 Suppl 2:S94-S98.
11. Prentice AM, Nabwera H, Kwambana B, et al. Microbes and the malnourished child. *Sci Transl Med.* 2013;5(180):180fs11.