

Introduction

- Micronutrient deficiencies occur in patients with bariatric surgery due to disruption of normal absorption and anomaly of the gut anatomy.
- The clinical findings of micronutrients deficiency may mimic other disease presentations such as those of autoimmune etiologies.
- The purpose of this case is to promote a high suspicion of micronutrients deficiency in patients with bariatric surgery with specific clinical and laboratory findings.

Case Description

Case Presentation:

- A 50-year-old severely malnourished female with a past medical history significant for gastric bypass 10 years ago prior to admission who presents with generalized weakness and desquamating rash on extremities (**Image 1**).
- A month prior to admission, patient had nausea, vomiting, diarrhea, leukopenia and anemia with unintentional weight loss of 13.6 kg over 3 weeks.

Consults:

- Dermatology and Nutrition were consulted.
- Autoimmune work-up was initiated, which came back negative.
- Dermatology suspected rash was due to nutritional deficiency and requested skin biopsy and micronutrient levels.

Labs: Low levels of the following Vitamins: A, B1, B6, C, and E, along with Zinc and Copper, BMI, Prealbumin, Albumin and Total Protein (**Table 1**).

Skin Biopsy Results: Compatible with nutritional deficiency.

Images

	Value	Normal Value Ranges	Clinical Correlation of Deficiency
Vitamins			
Vitamin A	0.09 mg/L	0.30-1.20 mg/L	Diffuse upper and lower extremity weakness, poor gait, painful, diffuse, erythematous and desquamating rash, severe generalized pain, diffuse abdominal pain, cold intolerance, anemia, insomnia, and anxiety
Vitamin B1	70 nmol/L	70-180 nmol/L	
Vitamin B6	11.1 nmol/L	20-125 nmol/L	
Vitamin C	40 µmol/L	20-114 µmol/L	
Vitamin E	3.5 mg/L	5.5-18.0 mg/L	
Minerals			
Zinc	33.5 µg/dL	60-120 µg/dL	Painful, diffuse, erythematous and desquamating rash, sepsis, MRSA bacteremia, enterocolitis, thrush, diarrhea, nausea, impaired appetite
Copper	35.8 µg/dL	80-155 µg/dL	Cold intolerance, sepsis, MRSA bacteremia, lymphocytopenia, anemia, thrush
Ceruloplasmin	10 mg/dL	18-58 mg/dL	Diffuse upper and lower extremity weakness, poor gait, diffuse abdominal pain
Proteins			
Total Protein	5.8 g/dL	6.4-8.3 g/dL	Painful, diffuse, erythematous desquamating rash and diffuse edema more prominent in upper extremities
Prealbumin	Undetectable	20-40	
Albumin	2.7 g/dL	3.5-2.2 g/dL	

Table 1: Vitamin, Mineral and Protein Deficiencies with Clinical Correlation



Image 1: Before and After Nutritional Supplementation

Case Description (cont.)

Diagnosis: Severe Micronutrient Deficiency

Treatment Regimen (for 2 weeks):

1. IV Vitamin Infusion
 - a. Zinc Chloride 30 mg,
 - b. Copper Chloride 4,000 mcg,
 - c. Folic Acid 1 mg,
 - d. Thiamine (VITAMIN B-1) 500 mg,
 - e. Pyridoxine (B-6) 100 mg,
 - f. Ascorbic Acid 1,000 mg in 0.9 % NaCl 500 mL
2. Daily Cholecalciferol 50 mcg
3. Daily Vitamin A capsule 20,000 Units
4. Daily Vitamin E capsule 450 mg
5. Daily Cholecalciferol (Vitamin D-3) tablet 50 mcg
6. Weekly Ergocalciferol (Vitamin D-2) capsule 1.25 mg
7. Weekly Multivitamin tablet 1 tablet Daily

Outcome:

Tremendous improvement in her weight, strength, gait, diarrhea, ability to tolerate oral intake, skin lesions (Image 1) and leukopenia and anemia.

Conclusion

- Short-term benefits of gastric bypass may optimize weight in patients, however severe malnutrition can develop over a prolonged period eventually leading to systemic clinical deterioration.
- Clinical manifestations of nutritional deficiency may present like other diseases obscuring the need to consider micronutrients deficiency as the primary cause.
- Clinicians should have a high suspicion of nutritional deficiency in the setting of a history of bariatric surgery and replete deficiencies to optimize clinical outcome.