**Patient**: E.B. (DOB: 1960-11-05)  
**MRN**: 893746  
**Admission**: 2025-03-18 | **Discharge**: 2025-03-23  
**Physicians**: Dr. R. Thompson (Internal Medicine), Dr. K. Patel (Gastroenterology), Dr. L. Martinez (Hematology)

**DISCHARGE DIAGNOSIS**

Pernicious Anemia with Severe Vitamin B12 Deficiency

**DETAILED DIAGNOSIS**

* **Primary**: Pernicious Anemia with Severe Vitamin B12 Deficiency
* **Diagnosed**: 2025-03-19
* **Laboratory Findings**:
  + Hemoglobin: 7.2 g/dL (Reference: 12.0-15.5)
  + MCV: 112 fL (Reference: 80-100)
  + Vitamin B12: <50 pg/mL (Reference: 200-900)
  + Methylmalonic acid: 3.85 μmol/L (Reference: 0.08-0.56)
  + Homocysteine: 89 μmol/L (Reference: 5-15)
  + Reticulocyte index: 0.4 (Reference: >2.0 in appropriate response to anemia)
* **Immunologic Studies**:
  + Anti-intrinsic factor antibodies: Positive
  + Anti-parietal cell antibodies: Positive
* **Peripheral Blood Smear**: Marked macrocytosis with oval macrocytes, anisocytosis, poikilocytosis, and hypersegmented neutrophils
* **Bone Marrow** (2025-03-19):
  + Hypercellular (70-80%) with marked erythroid hyperplasia
  + Megaloblastic changes in erythroid precursors
  + Dysmyelopoiesis with giant metamyelocytes and hypersegmented neutrophils
  + No evidence of dysplasia or malignancy
  + Iron stores adequate
  + Consistent with megaloblastic anemia due to vitamin B12 deficiency
* **EGD with Gastric Biopsy** (2025-03-20):
  + Atrophic gastritis in body and fundus
  + Negative for Helicobacter pylori
  + Histopathology: Chronic atrophic gastritis with intestinal metaplasia, consistent with autoimmune gastritis
* **Clinical Manifestations**:
  + Hematologic: Severe macrocytic anemia, mild thrombocytopenia
  + Neurologic: Peripheral neuropathy with paresthesias, decreased proprioception, diminished reflexes in lower extremities, positive Romberg sign, mild ataxia
  + Gastrointestinal: Glossitis, atrophic glossy tongue with loss of papillae, anorexia, unintentional weight loss (6 kg over past 3 months)
  + Constitutional: Fatigue, weakness, shortness of breath with exertion, reported lightheadedness when standing quickly

**CURRENT TREATMENT**

**Vitamin B12 Replacement Therapy**:

* Cyanocobalamin 1000 mcg IM daily for 7 days
* Then weekly for 4 weeks
* Then monthly indefinitely

**Response to Therapy**:

* Hemoglobin increased from 7.2 g/dL to 8.9 g/dL during hospitalization
* Appropriate reticulocytosis observed
* Early improvement in fatigue and lightheadedness
* Initial improvement in paresthesias, with expectation of continued neurological recovery over several months

**PREVIOUS TREATMENT HISTORY**

* No prior documented diagnosis of pernicious anemia
* Received 2 units PRBC 2 weeks prior to admission for symptomatic anemia (outside ED)
* No prior vitamin B12 supplementation
* Had been taking a multivitamin daily (insufficient to overcome malabsorption)

**COMORBIDITIES**

* Breast cancer (2023, s/p right lumpectomy and radiation, in remission on anastrozole)
* Hypothyroidism (2018, controlled on levothyroxine)
* Vitiligo (2010)
* Osteoporosis
* Hypertension (controlled)
* Hyperlipidemia
* GERD

**HOSPITAL COURSE**

64-year-old female presented with severe macrocytic anemia, neurological symptoms, and constitutional complaints. Laboratory workup confirmed profound vitamin B12 deficiency with elevated methylmalonic acid and homocysteine levels. Bone marrow examination revealed megaloblastic changes, and endoscopy with biopsy showed atrophic gastritis. Immunologic studies were positive for anti-intrinsic factor and anti-parietal cell antibodies, confirming pernicious anemia.

Parenteral cyanocobalamin therapy was initiated with 1000 mcg IM daily. Patient responded well with improvement in fatigue and lightheadedness, and hemoglobin increased to 8.9 g/dL. Neurological symptoms showed early improvement, though complete resolution expected to take several months.

Breast cancer remission status confirmed with no evidence of recurrence. Anastrozole was stopped because it was seen causal for development of B12 deficiency.

Patient received education on vitamin B12 self-injection technique and importance of lifelong replacement therapy.

**DISCHARGE MEDICATIONS**

* Cyanocobalamin 1000 mcg IM daily (for 2 more days, then weekly for 4 weeks, then monthly)
* Folate 1 mg PO daily (for 28 days during high-dose vitamin B12 treatment)
* Levothyroxine 112 mcg PO daily
* Amlodipine 5 mg PO daily
* Rosuvastatin 10 mg PO daily
* Omeprazole 20 mg PO daily
* Calcium carbonate 600 mg/Vitamin D 400 IU PO BID
* Alendronate 70 mg PO weekly (take first thing in morning with full glass of water, remain upright for 30 minutes)

**FOLLOW-UP PLAN**

**Hematology**:

* Dr. L. Martinez in 3 days (2025-03-26) and 2 weeks (2025-04-06)
* Labs: Electrolytes, CBC, reticulocyte count, vitamin B12 level at 2 weeks, then at 3 months, then every 6-12 months
* Assessment of response to B12 therapy and neurological recovery
* Target B12 levels between 400-900 pg/mL during maintenance phase

**Gastroenterology**:

* Dr. K. Patel in 4 weeks (2025-04-20)
* Discussion regarding surveillance for gastric cancer (increased risk with atrophic gastritis)
* Consideration for follow-up endoscopy in 1 year
* Assessment of gastric acid secretion and potential consequences for medication absorption

**Primary Care**:

* Dr. R. Thompson in 4 weeks (2025-04-22)
* Monitoring for other autoimmune conditions given existing autoimmune predisposition (autoimmune thyroid disease, adrenal insufficiency, type 1 diabetes, vitiligo)
* Management of comorbid conditions
* Annual mammogram due June 2025 for breast cancer surveillance
* Bone density scan due September 2025 (monitoring for anastrozole-associated bone loss)

**Patient Education**:

* Self-administration technique for vitamin B12 injections demonstrated and verified
* Information provided on signs/symptoms requiring medical attention:
  + Worsening neurological symptoms
  + Signs of anemia
  + Symptoms of gastritis
  + Signs of hypokalemia
* Dietary counseling provided, emphasizing that B12 supplementation will still be required despite dietary intake

**KEY LAB VALUES**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Admission** | **Discharge** | **Reference** |
| Hemoglobin | 7.2 | 8.9 | 12.0-15.5 g/dL |
| MCV | 112 | 108 | 80-100 fL |
| Platelets | 112 | 128 | 150-400 x10^9/L |
| Reticulocyte count | 0.8 | 4.6 | 0.5-2.5% |
| Reticulocyte index | 0.4 | 3.5 | >2.0 |
| Vitamin B12 | <50 | 1,850 | 200-900 pg/mL |
| Methylmalonic acid | 3.85 | 2.12 | 0.08-0.56 μmol/L |
| Homocysteine | 89 | 42 | 5-15 μmol/L |
| LDH | 985 | 280 | 125-220 U/L |

**Electronically Signed**:  
Dr. R. Thompson (Internal Medicine)  
Dr. L. Martinez (Hematology)  
Dr. K. Patel (Gastroenterology)  
Date: 2025-03-23