# A Case of Systemic Lupus Erythematosus Presenting as Pure Red Cell Aplasia

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**ABSTRACT**
Pure red cell aplasia (PRCA) is an uncommon condition, which is rarely associated with Systemic Lupus Erythematosus (SLE). Prompt identification and management of the underlying SLE results in correction of anemia. We report the case of a young female who presented due to severe anemia since the last two years. The cause of her anemia on initial investigations was not elicited in these two years, during which response to hematinics was poor and she remained transfusion dependent. Bone marrow biopsy showed PRCA after which autoimmune workup revealed SLE. Subsequently, treatment of SLE with steroids led to normalization of hemoglobin levels within a follow-up period of three months.

**Keywords:** Pure red cell aplasia; Systemic lupus erythematosus; Diagnosis; Anemia

## Case presentation

This is a 27- year- old married lady who presented in outpatient department of Shifa International Hospital (SIH), Pakistan with progressively worsening pallor, jaundice and fatigue since last 2 years. Her complete blood counts (CBC) showed persistently low hemoglobin (Hb) for which she had received multiple blood transfusions over the last two years. She is now experiencing hair loss and drooping of right eye lid. There were no complaints of rash, oral ulcers or joint pain.

On physical examination patient was vitally stable and afebrile. Her conjunctiva was pale. There was no organomegaly, lymphadenopathy or edema.

Cardiovascular and respiratory examinations were unremarkable.

Her initial laboratory investigations at SIH are summarized in Table 1.

Her CT brain (without contrast), ultrasound abdomen and chest X-ray showed normal findings. Her immunological profile revealed that she was positive for Anti-nuclear antibodies (ANA) and anti DNA, anti dsDNA antibodies, nucleosome antibodies and histone antibodies.

Bone marrow biopsy was advised in order to assess the underlying cause of persistent anemia. Bone marrow aspirate and trephine showed hypocellular marrow with markedly suppressed erythropoiesis. Granulocytic and megakaryocytic series were normal

(Figure2 1 – 2). There was no tumour infiltration, granuloma or fibrosis seen. Bone marrow was stained for presence of iron that showed 2+ stainable iron.

**Table 1:** Laboratory investigations on presentation at SIH

| Laboratory investigations | Patient values | Reference range |
|---|---|---|
| Hemoglobin(g/dl) | 4.7 | 12-15 |
| WBC count (/ul) | 6290 | $4\text{-}10\text{x}10^9$ |
| RBC count (/ul) | 1.66 | $3.8\text{-}4.8\text{x}^{12}$ |
| Platelet count (/ul) | 309000 | 150-450000 |
| Reticulocyte count(%) | 0.2 | 0.5 – 2.5% |
| Neutrophils(%) | 45 | 40-80 |
| Lymphocytes (%) | 48 | 20-40 |
| Monocytes (%) | 07 | 2-10 |
| ESR (mm) | 105 | <20mm/h |
| Serum Iron (ug/dl) | 252 | 47.5-152 |
| Serum TIBC (ug/dl) | 333 | 250-350 |
| Total bilirubin(mg/dl) | 3.8 | 0-1.0 |
| SGPT (U/L) | 610 | 10-40 |
| Hepatitis B surface antigen | Negative | |
| Hepatitis C virus antibodies | Negative | |
| Serum Lactate dehydrogenase(LDH)U/L | 348 | 125-220 |
| Serum folate (ng/ml) | 11.4 | 2.6-12.2 |
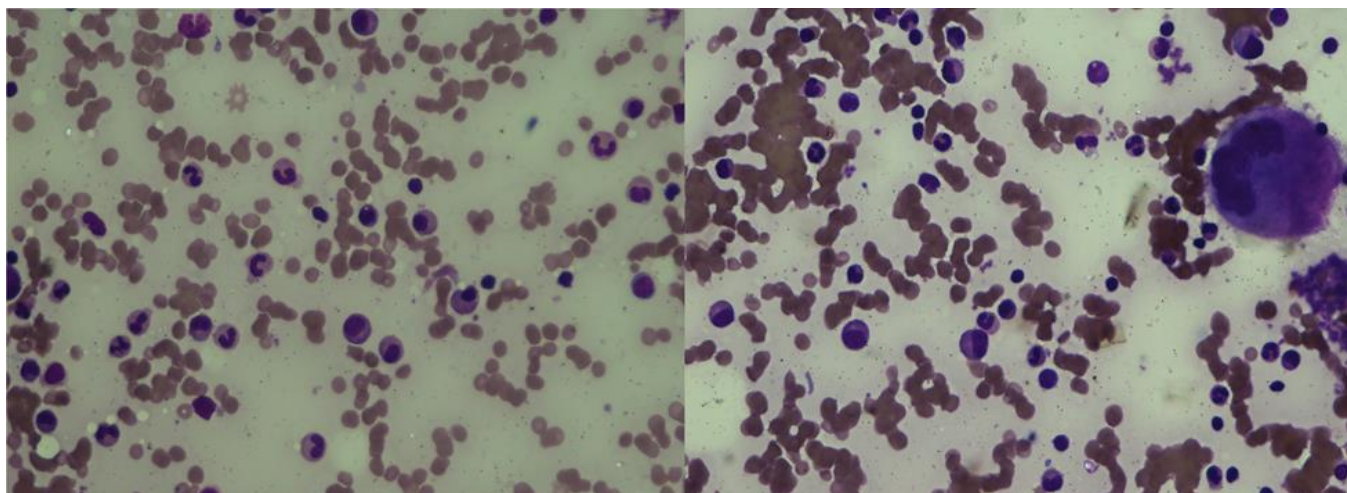


Figure 1. Bone marrow aspirate showed markedly suppressed erythropoiesis with very few early erythroid precursors. There are adequate megakarocytes and maturing granulopoiesis.
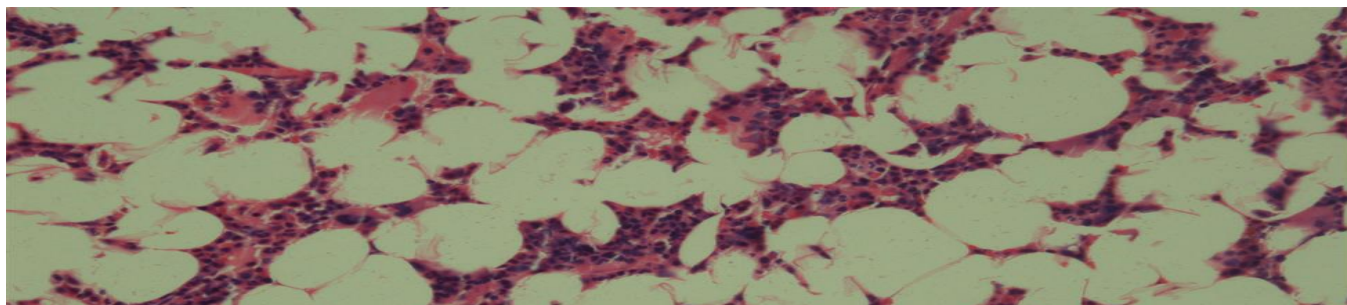


Figure 2. Bone marrow trephine biopsy showed hypocellular marrow with markedly suppressed erythropoiesis. Adequate megakaryocytes with unremarkable morphology are identified. Granulopoiesis is maturing.

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Bone marrow findings along with immunological profile were most suggestive of pure red cell aplasia with SLE. Patient was put on deltacortil (30mg/kg/day). On follow up, her hemoglobin levels showed significant improvement with Hb of 8g/dl at two weeks, 12.5g/dl at two months and 15.6 g/dl after three months of starting steroids. There was also clinical improvement in her signs and symptoms of anemia.

## DISCUSSION

Hematological manifestations are frequently seen in patients with SLE and have been incorporated in both the American College of Rheumatology (ACR) Classification and Systemic Lupus International Collaborating Criteria (SLICC) for SLE[5]. These manifestations are of variable severity and can occur as part of the disease process itself or as a side effect of treatment. While all three cell lines can be affected, anemia is the most common hematologic abnormality occurring in approximately 50% of SLE patients at some point during the course of their disease[6]. The etiology of anemia in SLE is diverse and multifactorial. Anemia of chronic disease is the most common cause. Other causes include iron deficiency, concomitant autoimmune disorder (pernicious anemia), autoimmune hemolytic anemia, microangiopathic hemolytic anemia, iatrogenic anemia secondary to use of immunosuppressive drugs such as azathioprine[7]. PRCA is a rare occurrence in SLE with a handful of cases reported in the literature.

Acquired PRCA has been reported in a variety of autoimmune disorders such as SLE, ankylosing spondylitis and rheumatoid arthritis[8]. The pathogenesis of secondary acquired PRCA in autoimmune diseases is generally considered to be immunologic, though not always antibody mediated. There may be development of antibodies against erythroid precursors and in some cases against erythropoietin itself[9]. T cell mediated mechanisms are also implicated. Arcasoyet.al reported the case of a female patient in 2005 who developed PRCA five years after an initial diagnosis of SLE. In this patient, hematopoietic progenitor cell assays showed an absence of burst-forming unit-erythroid (BFU-e) colony formation which was corrected after T-cell

depletion of the patient's peripheral blood. Furthermore, in vitro studies showed that adding this patient's plasma to progenitor cultures from healthy donors did not suppress BFU-e, thus indicating that the effects observed were not antibody mediated in this case [10].

In our case the patient did not have typical presenting features of SLE such as malar rash, photosensitivity, joint pain or oral ulcers; therefore she went undiagnosed for a period of almost two years in which she suffered from anemia. PRCA was detected on her initial bone marrow biopsy five months prior to her presentation at our institute. However, the cause of PRCA was not elicited in these five months. Viral causes were ruled out and she was managed supportively with blood transfusions without identification and management of the underlying disease. It is possible that PRCA can precede the appearance of SLE. Ideguchiet.al reported one such case of a patient who was diagnosed with PRCA and one month later developed the features of rash and polyarthritis. It is important to note that in this case, the patient tested positive for ANA and anti DNA antibodies prior to developing the clinical manifestations of SLE, which is similar to the disease course in our case [11]. Therefore we recommend that in cases of PRCA, ANA screening and subsequent testing for anti ds-DNA should be done for prompt identification of the underlying etiology.

While PRCA and SLE are associated conditions, the onset of PRCA does not seem to correlate with the symptoms of SLE.In a study of 24 cases, Habibet. al observed that when the diagnosis of PRCA preceded the diagnosis of SLE, the time duration between detection of the two conditions ranged between two months and four years. Conversely, when SLE manifested earlier, PRCA was detected six weeks to 12 years following the initial diagnosis.Additionally, they found that patients who had SLE and PRCA concomitantly were less prone to developing pleuritis [12].

Effective management of the underlying SLE results in correction of the anemia seen in SLE associated PRCA. Treatment has varied in the literature and is based upon the use of immunosuppressive drugs such as steroids, cyclosporine, cyclophosphamide,

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mycophenolatemofetil and rituximab[2,10,13]. Our patient has responded well to the use of steroids with no other immunosuppressive therapy needed.

## CONCLUSION

PRCA is a rare condition. Clinicians should be mindful of the association of PRCA with SLE as treatment of the underlying disorder results in correction of the anemia and avoids any unnecessary blood transfusion.

## CONFLICT OF INTEREST

All authors declare that they have no conflict of interest.

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