

Burton line and basophilic stippling in lead poisoning

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A 47-year-old man who had been working as a self-employed plumber in Nara Prefecture, Japan, for about 30 years presented to the emergency department with a 2-week history of abdominal pain and anorexia. Blood tests showed microcytic anemia: the blood smear showed erythrocytes with basophilic stippling (Figure 1A). These small, punctate inclusions, derived from ribosomes or ribosomal RNA fragments, are classically associated with lead poisoning, but can also be observed in blood disorders such as thalassemia, sickle cell disease, and megaloblastic anemia.¹ Physical examination showed a gum discoloration known as Burton line (Figure 1B). This bluish line along the gingival margin indicates chronic lead poisoning. It occurs when lead reacts with bacteria in dental plaque to form and deposit lead sulfide. It is found in about half of those with chronic lead poisoning with exposures of longer than 1 year.² The patient's blood lead level was markedly elevated at 108 µg/dL (5.2 µmol/L), and we diagnosed lead poisoning, with exposure attributed to work on old lead water pipes. We administered chelation therapy with calcium disodium ethylenediaminetetraacetic acid, resulting in symptom improvement within a few weeks. Regular monitoring of the patient's blood lead level showed gradual improvement.

Although lead poisoning is uncommon in high-income countries, owing to regulations limiting lead exposure, lead is still used in a variety of occupational and recreational applications. The symptoms of lead poisoning are nonspecific and include abdominal pain, constipation, anorexia, headache, fatigue, and neurologic features (e.g., irritability, drowsiness, convulsions, and coma), sometimes making diagnosis difficult. The threshold for the manifestation of symptoms related to blood lead level varies among individuals. Chelation therapy is indicated for asymptomatic patients with levels greater than 70 µg/dL (> 3.4 µmol/L) and for symptomatic patients with levels of 45–70 µg/dL (2.2–3.4 µmol/L).³ Burton lines and basophilic stippling are important clinical clues suggesting this uncommon diagnosis.

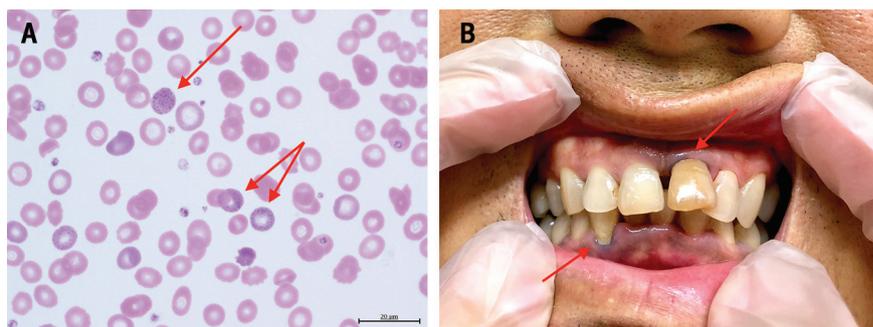


Figure 1: (A) Peripheral blood smear showing erythrocytes with basophilic stippling (arrows) in a 47-year-old male plumber with lead poisoning. (B) Burton line (arrows) in some of the patient's gum lines.

References

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