

# Importance of Tongue Manifestations in Iron Deficiency Anemia - A Case Report

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## ABSTRACT

Tongue acts as a mirror reflecting the systemic health status of the body. Various systemic diseases including endocrinopathies, nutritional disorders, hematologic disorders, systemic infections can manifest signs and symptoms in the tongue and oral mucosa [1]. Iron is one of the most important trace elements required by the human body, it plays a significant role in maintaining the physiological process of all cells including growth and differentiation. An average of 3–5 grams of iron is stored in the human body, most of which is found in the blood, liver, bone marrow and muscles as heme. Daily iron loss through skin, minor blood losses and by enteric desquamation is about 1–2 mg [2]. Anemia is one of the major health problems worldwide. In Developing countries like India, Iron deficiency is one of the most common causes of Anemia. World

Health Organization (WHO) defines Anemia as state of blood with hemoglobin level less than 12 gm/dl in women and less than 13 gm/dl in men. Iron deficiency Anemia (IDA) is more prevalent in women than men. It is also reported to be common among children and adolescents [3]. This case reports highlights the diagnosis of IDA from its manifestations in the tongue.

**Keywords:** Blood cell count, Ferritin, Fissured Tongue, Glossitis, Iron Deficiency Anemia.

## INTRODUCTION

Tongue acts as a mirror reflecting the systemic health status of the body. Various systemic diseases including endocrinopathies, nutritional disorders, hematologic disorders, systemic infections can manifest signs and symptoms in the tongue and oral mucosa [1]. Iron is one of the

most important trace elements required by the human body, it plays a significant role in maintaining the physiological process of all cells including growth and differentiation. An average of 3–5 grams of iron is stored in the human body, most of which is found in the blood, liver, bone marrow and muscles as heme. Daily iron loss through skin, minor blood losses and by enteric desquamation is about 1–2 mg [2]. Anemia is one of the major health problems worldwide. In Developing countries like India, Iron deficiency is one of the most common causes of Anemia. World Health Organization (WHO) defines Anemia as state of blood with hemoglobin level less than 12 gm/dl in women and less than 13 gm/dl in men. Iron deficiency Anemia (IDA) is more prevalent in women than men. It is also reported to be common among children and adolescents [3]. This case reports highlights the diagnosis of IDA from its manifestations in the tongue.

## **CASE REPORT**

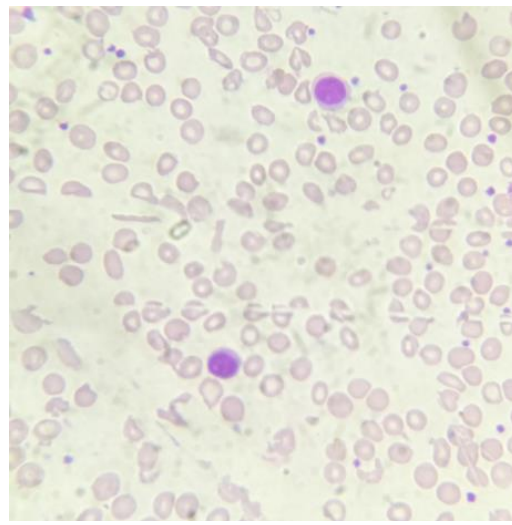
A 23 year old male patient reported to the Out Patient Department with the complaint of burning sensation on his tongue since three months. On eliciting his medical history, it was found that he had amoebic colitis and undertook medical management for the same before 6 months. There was no reported history of any Neurological disorders. Patient did not report to have any adverse habits. General examination revealed Mild

pallor of the conjunctiva, no evidence of cyanosis, icterus, clubbing and edema noted. On Intra oral examination, the tongue exhibited a deep central longitudinal furrow of 2-3 mm depth along the median sulcus with multiple, short lateral radiating branches. Transverse furrows of about 1-2 mm in depth and 2mm width (Figure 1) were also seen in the tip and the lateral borders of the tongue. There was no significant tongue coating evident. On palpation, the tongue was in normal consistency and non-tender. His buccal and labial mucosa appeared to be normal without significant Pallor. There was no carious tooth and his oral hygiene was satisfactory. A provisional diagnosis of fissured tongue with Glossopyrosis was made and the patient was sent for a complete blood count along with a peripheral blood smear (PBS), evaluation of serum iron and ferritin levels. PBS revealed Hypochromic Microcytic Anemia (Figure2). Investigations (Table 1) directed to a confirmed diagnosis of Glossopyrosis secondary to IDA. The patient was further referred to an internal medicine specialist for evaluation of IDA and was prescribed iron supplements. Significant resolution of the burning sensation was reported at the end of two weeks and adequate improvements in the hematologic parameters were found at the end of three months.

**Figures:**



**Figure 1**



**Figure 2**

**Figure legends:**

**Figure 1:** Clinical picture showing multiple furrows on the dorsum and lateral borders of the tongue.

**Figure 2:** Peripheral blood smear under 100x magnification (Oil immersion) showing microcytic hypochromic red blood cells with presence of few target cells, lymphocytes and platelets.

**Table 1 - Observed values of clinical laboratory investigations**

Parameter	Findings
Hemoglobin (Hb)	9.1 g/dl
Red Blood Cell (RBC) Count	3.9 million cells/cu. mm
White Blood Cell (WBC) Count	7,800 cells/cu. mm
Platelet Count	3,60,000 cells/cu. mm
Mean Corpuscular Volume (MCV)	74.3 fL
Mean Corpuscular Hemoglobin (MCH)	23.3 pg
Mean Corpuscular Hemoglobin (MCHC)	31.37 g/dl
Red Cell Distribution Width (RDW)	17.2 %
Serum Iron	42 mcg/dl
Serum Ferritin	16 ng/dl
Peripheral Blood Smear	Microcytic Hypochromic Cells

## **DISCUSSION**

Worldwide Nutritional iron deficiency is one of the common causes of anemia. Iron deficiency progresses in three stages. The Initial stage occurs when the body's iron demand exceeds the body's ability for dietary iron absorption, also referred as the negative oral balance stage. As long as the iron stores are available the Red Blood Cell (RBC) morphology remains normal. The next stage is the appearance of microcytic cells on PBS, which is called as the stage of iron-deficient erythropoiesis. The third and final stage is the IDA itself which manifests with low levels of hemoglobin and hematocrit [4]. Pallor and atrophy of oral mucosa, angular cheilitis, cheilosis, atrophic glossitis, stomatitis, candidiasis, oral lichen planus and aphthous ulcers are said to be the common oral manifestation of IDA [5].

Fissured tongue demonstrates multiple fissures and grooves over the dorsum of tongue. The exact etiology is still unknown but the role hereditary in development of fissured tongue have been illustrated in several studies. It is also known to be associated with Melkersson-Rosenthal syndrome, Down Syndrome, Acromegaly, Psoriasis, Oro-facial granulomatosis, Sjogren's syndrome and Geographic tongue [6]. Alsheik E et al. [7] reported a prevalence rate of 24.4% for fissured tongue in patients with IDA in Egyptian population. Most cases of fissured tongue are asymptomatic, unless

associated with systemic illness like diabetes, hypertension, etc. Burning sensation associated with fissured tongue may be correlated with the poor oral hygiene and other systemic factors. Local factors like allergic reactions, parafunctional habits, ill fitting dentures, xerostomia and galvanism may also cause burning sensation [8]. In our case there was no local factors contributing to the burning sensation, Hence the blood profile was checked which later turned out to be Iron deficiency Anemia. Burning sensation of tongue in IDA is also attributed to the thinning of the epithelium of the tongue, Per Lin et al. [9] stated that diffusion of spicy salivary components through the atrophied epithelium of tongue into the sub epithelial connective tissue leads to irritation of free sensory nerve endings that manifest as burning sensation, numbness, pain of the tongue. Glossitis is an important sign of folate deficiency and vitamin B12. But Iron deficiency also exhibits glossitis, Iron deficiency glossitis has been described as a patchy/diffuse papillae atrophy in the dorsum of tongue which is often associated with burning sensation of pain [10]. Presence of hypochromic microcytic cells in a peripheral blood smear along with low serum ferritin levels in association with high Red Cell Distribution Width (RDW) directs the diagnosis towards IDA [11]. Supplementation of iron, vitamin B12, and folic acid is found to be helpful in such

patients, and Zinc supplementation to those with taste dysfunction is also recommended [12]. Appropriate referral to a medical specialist for evaluation of the underlying hematinic deficiency is crucial for successful management.

## **CONCLUSION**

This case report attempts to emphasize the importance of tongue examination, which is often looked down during a dental screening. A wide array of hematologic deficiencies exhibits manifestations in the oral cavity and tongue. Most of those findings are nonspecific, but can be of immense help to the patient if recognized properly and referred appropriately to rule out underlying systemic illness.

### ***Declaration by Authors***

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