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Figure 1. Photograph of patient's left hand showing spoon-shaped nails (koilonychia) in her index and middle fingers.

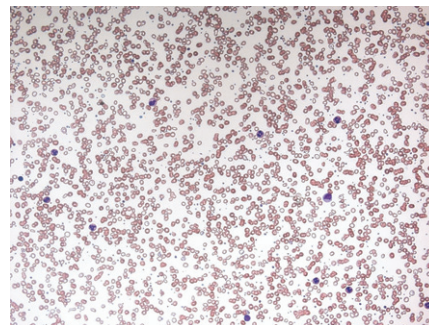


Figure 2. Photomicrograph of peripheral blood smear from patient showing mixed picture of hypochromia and microcytosis (patient's own erythrocytes), and normochromia and normocytosis (transfused blood). Used with permission of Gautam Kumar, MBBS, MRCP, Department of Internal Medicine, Mayo Clinic, Rochester, MN.

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A 49 year-old woman presented to our emergency department (ED) with 2 months of progressive shortness of breath, lightheadedness, headache, and palpitations. She was initially evaluated at another ED and found to have hemoglobin level of 2 g/dL and received a transfusion. She had no melena, and her last menstrual period was 6 months earlier. She had a history of peptic ulcer disease. On examination, she was pale, with a systolic ejection murmur (grade 3/6) and eyeball bruit with koilonychia (Figure 1). Rectal examination results were normal. Blood film showed hypochromic microcytes (Figure 2). Esophagogastroduodenoscopy and colonoscopy results were normal. Anti-Gliadin antibodies were elevated: immunoglobulin A 7.3 (0 to 4.9) and immunoglobulin G 37.3 (0 to 9.9). Ferritin level was 3 (14 to 307) $\mu\text{g/L}$. Pregnancy test was negative. She declined small-bowel biopsy. She was diagnosed with iron deficiency anemia because of celiac disease. After commencing a gluten-free diet, she remains well on follow-up.

*For the diagnosis and teaching points, see page 250.
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between the flexor digitorum superficialis/flexor digitorum profundus tendons to the right index finger. Interestingly, the surrounding soft tissues were adhered to the nail due to a layer of hardened glue found around it (Figure 2). An extended incision was required in order to remove the nail. Postoperatively, the patient had an uneventful recovery.

Penetrating hand trauma resulting from nails can have serious consequences and a detailed history of the incident circumstances (the type of the nail gun and nails used) is important. Hand radiographs provide you with useful information and clues for further management.

A simple understanding of the mechanism and the type of nails is required. Pneumatic guns use the nails glued together loosely, in a long strip which feeds into the "barrel" of the gun (Figure 3). When the nail is hammered into the wood, the intense friction heats the glue to the melting point. Once the nail is in place, the glue quickly hardens again, fusing the nail to the surrounding wood.

This can constitute a troublesome foreign body reaction if left behind because the nail was merely extracted without opening and exploring the tract.

Cooper barbs present on the nail's stalk may improve the grip of the nail to the surrounding wood but will cause more severe injuries.

Removal of the nail retrogradely by merely extraction results in soft tissue entrapment and damage to the surrounding vital structures. There is also a risk of detachment of the barbs.

Therefore, removal of the nail in the ante grade fashion, after cutting the head of the nail, is recommended in case of no

significant tissue damage but thorough exploration through the whole length of the zone of trauma is necessary in the presence of glue.

Successful management requires a thorough understanding of this unique injury and appropriate early referral to hand service specialist for appropriate nail removal and wound care.

Adherence to safety precautions involving the use of nail guns with introduction of training in the workforce to encourage awareness of the dangers of such devices should reduce the incidence of these injuries.

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DIAGNOSIS:

Koilonychia, or spoon-shaped nails, is generally associated with iron-deficiency anemia. Nail matrix angulation as a result of connective tissue changes has been suggested as a possible cause.¹ Celiac disease is an underdiagnosed enteropathy characterized by gluten sensitivity, resulting in inflammation, small intestinal mucosal atrophy, and iron-deficiency anemia (hence, the koilonychia in our patient). Because of the protean manifestations of this disorder, a high index of suspicion is vital for diagnosis. Koilonychia has also been reported in several normal and abnormal states: idiopathic, hereditary, traumatic, occupational, endocrine-related, and even in polycythemia vera.² Koilonychia points to the chronicity of anemia in our ED patient and helps narrow the differential diagnoses.

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