A 52-year-old man diagnosed with polycythemia vera had received hydroxyurea (HU) for 36 months before presenting to our clinic. The patient exhibited skin changes to both hands related to HU therapy, including erythema, scaling, brittle nails, onycholysis and onychodystrophy. Such changes were equally distributed across eight of his nine distal phalanges (one distal phalanx had been accidentally amputated) (Fig. 1A and B). Notably, the nail of the third finger of his left hand was spared of any changes (Fig. 1B, arrow). On further questioning, the patient reported that he had accidentally shot himself with a BB gun and that a lead-containing shot pellet was still lodged in the distal phalanx of his left third finger (Fig. 2, arrow).

HU is widely used for the treatment of both malignant and non-malignant hematologic disorders. HU is a potent ribonucleotide reductase inhibitor, which interferes with DNA repair in ultraviolet-irradiated human cells and with replication of basal layer keratinocytes. The complex of histologic changes associated with long-standing HU therapy has been referred to as ‘HU dermopathy’ and includes epidermal atrophy with areas of hyperkeratosis of basal keratinocytes, oversized epidermal cells, hydropic degeneration, dyskeratotic cells, focal lichenoid reaction and thickening of the basement membrane. Clinical manifestations include acral erythema, hyperpigmentation, xerosis, scaling, alopecia, atrophy and nail changes. More severe complications of HU therapy are skin ulceration, which can lead to the discontinuation of treatment, and squamous cell dysplasia, often evolving into squamous cell carcinoma. While improvement of cutaneous changes and ulcers has been reported upon discontinuation of the drug, squamous cell dysplasia and carcinoma are irreversible complications. Moreover, in many patients treatment cannot be discontinued and no viable therapeutic alternatives exist.

The mechanism by which the presence of the bullet may have prevented these changes from occurring in our patient is unclear. Intriguingly, it has been suggested that HU be endowed with chelating properties. Studies have shown that HU has an affinity for ferrous ions and can act as an iron chelator by virtue of its hydroxamate function. It is also suggested that an excess of chelatable and labile forms of iron or copper ions may influence the therapeutic response to HU. Although the presence of other metals in the shot pellet cannot be excluded, we speculate that binding of HU to the lead-containing bullet might have limited the relative bioavailability of the drug in the patient’s distal phalanx. Microvasculature anatomic changes induced by the shot pellet decreasing local exposure to HU should also be considered.

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