

Imatinib-associated Blue-gray Pigmentation Arising Within Chronic Stasis Dermatitis and Pigmented Purpuric Dermatoses

Aarushi Gulati D.O¹, Brittany Smirnov D.O²

¹A.T. Still University School of Osteopathic Medicine in Arizona, ²Fuchs Dermatology

Background

- Imatinib is a tyrosine kinase inhibitor used long term in chronic myeloid leukemia (CML) and is a recognized cause of cutaneous pigmentary change.
- Reported changes include both hypopigmentation and hyperpigmentation; blue-gray pigment deposition is rare and has been reported to favor the mucosa.^{1,2}
- Pigmented purpuric dermatosis (PPD) and chronic venous stasis dermatitis both deposit dermal hemosiderin and can obscure or mimic drug-associated pigment deposition.
- Distinguishing these overlapping processes on the lower extremity presents a diagnostic challenge.

Case Presentation

History

- A patient with a history of CML treated with imatinib since 2010 presented in 2026 with worsening blue-gray discoloration of the bilateral lower extremities.
- 18-month history of stasis dermatitis was reported with concurrent Schamberg-like pigmented purpuric changes preceding the gray pigmentation, which developed at the previous sites of hemosiderosis.
- Medications: imatinib and metoprolol.

Physical Examination

- Brown-red macules and patches at the distal lower extremities.
- Blue-gray to cool brown pigmentation prominent over the dorsal feet and anterior ankles.
- No mucosal or nail involvement.

Work-up

- Two 0.2 x 0.2 x 0.1 cm punch biopsies of the right shin and right foot were performed.
- Histologic examination was done with hematoxylin & eosin, Fontana-Masson, Prussian blue, PAS, CD3, and SOX-10 staining.



Figure 1. Brown-red pigmented purpuric and stasis changes with overlying blue-gray hyperpigmentation at the bilateral distal lower extremities.



Figure 2. Blue-brown hyperpigmentation within areas of chronic hemosiderosis at the bilateral anterior ankles and dorsal feet.

Dermatopathology Findings & Clinicopathologic Correlation

Hematoxylin & eosin examination findings

- Right anterodorsal distal lower extremity site: Stromal pandermal melanin pigment incontinence and hemosiderin deposition, associated with minimal stromal fibrosis and slight angioplastic change.
- Right foot site: Minimal pandermal perivascular CD3+ lymphocytic infiltrate in the background.

Special stains and immunohistochemistry

- Fontana-Masson: stromal melanin and melanophages throughout the pan dermis (papillary and deep reticular), most prominent in the upper dermis.
- Prussian blue: hemosiderin deposition in the pan dermis.
- PAS: no microorganisms, basement membrane alteration, thrombi, or intravascular hyaline material including cryoglobulins; slight vascular wall thickening in some angioplastic vessels.
- SOX-10: negative to negligible staining depicting no increase in epidermal melanocyte density.

Clinicopathologic interpretation

- Findings were interpreted as imatinib-induced hyperpigmentation despite the unusual anatomic location, on a background of smoldering acroangiodermatitis and chronic venous stasis dermatitis. Clinical correlation and direct immunofluorescence were recommended.

Discussion

- This case illustrates lower-extremity inflammation and hemosiderin deposition that may localize or accentuate imatinib-associated blue-gray pigmentation.
- Blue-gray imatinib pigment is often described on mucosal surfaces; presentation confined to the distal legs and dorsal feet is distinctly unusual.
- Pigment localized precisely to sites of longstanding hemosiderosis, suggesting that chronic cutaneous inflammation can act as a scaffold for dermal drug-related pigment deposition.
- Negative SOX-10 with Fontana-Masson and Prussian blue supports dermal pigment deposition as opposed to an organic melanocytic process.
- Recognizing this pattern may help clinicians distinguish medication-associated pigmentary change from chronic venous and pigmented purpuric dermatoses, particularly when blue-gray discoloration arises within sites of longstanding hemosiderosis.

Learning Points

- Imatinib may cause hyperpigmentation or blue-gray pigment deposition in the skin.
- Chronic cutaneous inflammation or hemosiderosis may accentuate localized drug-induced pigment changes.

Conclusion

- Imatinib-associated blue-gray pigmentation can arise on the lower extremities within areas of chronic stasis dermatitis and pigmented purpuric change.
- Biopsy with Fontana-Masson, Prussian blue, and SOX-10 clarifies the nature of the pigment and supports continued oncologic therapy without unnecessary discontinuation.

References

