

## LETTERS

### The authors reply to: “Doubts about first report of krokodil use in Canada”

We agree with Dr. Mitchell's<sup>1</sup> comment on our case report that critique is a part of the scientific process. To elaborate on our brief report,<sup>2</sup> the patient was referred to the academic dermatology service for a presumptive diagnosis of pyoderma gangrenosum. Despite the clinical presentation of the ulcers not being classic for pyoderma gangrenosum, the patient was treated aggressively for this condition in hospital with high-dose steroids for more than a month, antibiotics, and increasing doses of cyclosporine as a steroid-sparing agent, as well as intensive wound care. No substantial improvement occurred in this patient with this aggressive treatment, and the small improvements that were seen were most likely due to secondary infection responding to the antibiotics. The disease course was clearly not typical of pyoderma gangrenosum as a decreased ulcer size within 1 month of starting immunosuppressive medications was expected (a diagnostic criterion of pyoderma gangrenosum).<sup>3</sup>

Several experienced academic dermatologists reviewed the case. Additional collateral information was volunteered that suggested that the patient had a history of injection drug use and had injected himself with krokodil (desomorphine). With this new information, and careful review of the morphology of published reports on ulcers caused by use of krokodil, it was clear that the unusual blackish scale and necrotic morphology of the ulcers in this patient were pathognomonic of krokodil use. Our patient improved when pyoderma gangrenosum-focused treatment was withdrawn. On recent follow-up with this patient, his wounds remained healed without therapy, which is also atypical of pyoderma gangrenosum.

While not commonly used, krokodil is a cheaper and more accessible drug than heroin;<sup>4</sup> it can be made at home using easily obtainable ingredients. Its low cost and high potency (10 times more potent than morphine) may mean that it will be used more commonly in the future.<sup>3</sup>

This case is noteworthy for several reasons. First, a thorough clinical and collateral history is of utmost importance; second, it is imperative to avoid anchor-

ing bias to a diagnosis and physicians must generate a wide-differential diagnosis, particularly when a disease fails to improve as expected on treatment; and, lastly, morphology and visual diagnostic skills are key to accurately diagnosing dermatologic conditions.

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#### References

1. Mitchell IV. Doubts about first report of krokodil use in Canada [letter]. *CMAJ* 2019;191:E1033.
2. Ghazawi FM, Beecker J. Necrotic leg ulcers associated with krokodil injection in a 41-year-old man. *CMAJ* 2019;191:E712.
3. Maverakis E, Ma C, Shinkai K, et al. Diagnostic criteria of ulcerative pyoderma gangrenosum: a delphi consensus of international experts. *JAMA Dermatol* 2018;154:461-6.
4. Shelton M, Ramirez-Fort MK, Lee KC, et al. Krokodil: from Russia with love. *JAMA Dermatol* 2015;151:32.

**Competing interests:** None declared.