The primary aim of this study was to examine and describe peripheral intravenous extravasation (PIVE) injuries using point-of-care ultrasound (POC-US). A secondary aim was to define skin tissue changes before and after hyaluronidase application using POC-US.” Boyar et al (2018).

Abstract:

PURPOSE: The primary aim of this study was to examine and describe peripheral intravenous extravasation (PIVE) injuries using point-of-care ultrasound (POC-US). A secondary aim was to define skin tissue changes before and after hyaluronidase application using POC-US.

DESIGN: Case series design.

SUBJECTS AND SETTING: We report on 10 neonates with stage 3 or 4 PIVE who were studied clinically and with POC-US. All infants were studied during the December 2015 to September 2016 period in a large academic neonatal intensive care unit.

METHODS: Initially, neonates with PIVE were staged using 3 criteria: physical findings, nature of the infusate, and the size of the injury. Next, we described different ultrasound appearances of the tissue injury in PIVE based on the type of the infusate (clear fluid, blood, or both). We then located the largest PIVE pocket and measured the skin elevation over it. Skin elevation ratio was measured at 3 time points: before hyaluronidase injection followed by 3 to 6 hours and 24 hours after hyaluronidase therapy. Each ultrasound examination of the skin injury was staged (severe, moderate, mild, or minimal) based on the skin elevation ratio obtained. In addition, we described changes in the skin using ultrasound before and after hyaluronidase treatment.

RESULTS: Three types of ultrasound images based on the type of the extravasated fluid were described in detail. Based on the initial ultrasound measurements of the skin elevation ratio, 6 infants were staged with severe PIVE and 4 were staged as moderate PIVE. Finally, POC-US was used to describe the tissue changes before and after hyaluronidase injection.

CONCLUSIONS: Point-of-care ultrasound may offer more structured and objective staging
of PIVE injuries due to direct visualization of the skin tissue. This method needs to be further studied and introduced as a practical tool to complement physical examination of PIVE injuries.

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