All that is red is not blood!

A 62-year-old woman presented for screening colonoscopy after a 24-hour clear-liquid diet and Colyte preparation. Frank blood was noted from the point of colonoscope insertion up to the terminal ileum (Fig. 1a). Aspirate tested negative with the hemoccult card. Using narrow-band imaging (NBI) the “red liquid” appeared cyan blue (Fig. 1b). Upon further questioning during recovery, the patient reported eating red jello.

NBI is an alternative light-wavelength capture system that filters light in the visible spectrum, except for narrow bands in the blue and green wavelengths (415 nm and 540 nm, respectively) [1] (Fig. 3). The peak absorption spectrum of red dye is 502–518 nm and appears as a cyan color whereas oxyhemoglobin is absorbed at 415 nm and appears as dark maroon. As shown in Figs. 1a and 2a, red jello and post-polypectomy bleeding appeared indistinguishable under white light. Even the most sophisticated of tools, NBI, has demonstrated here a simple clinical use in differentiating between blood and other

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Fig. 1 Screening colonoscopy following ingestion of red jello. a Red liquid in colon lumen seen under white light. b Under the blue light of narrow-band imaging, the red dye in the jello (dye No. 40) appears blue–green.

Fig. 2 Bleeding from recent polypectomy site. a Seen under white light. b Seen under blue light; note the dark maroon color of the blood.

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Fig. 3 Maximum absorptive capacity of hemoglobin at a wavelength of 415 nm. Adapted with permission from Olympus Europe (www.olympus-europa.com).

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White light is composed of an equal mixture of RGB wavelength

Narrow Band Imaging – NBI

The narrow band light is composed of two specific bands that are strongly absorbed by hemoglobin

Short wavelengths have shallow penetration characteristics whereas long wavelengths penetrate deeper into the mucosa

415 nm light short wavelengths only the superficial layers of the mucosa → Absorbed by capillary vessels in the surface layer of mucosa

540 nm light Longer wavelengths penetrate deeper compared to 415 nm light. → Absorbed by blood vessels such as vein which are located deeper than capillary vessels in the surface layer of the mucosa
red substances. We suspect that this is not the first or the last case of “red jello stool” [2].

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References

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Corresponding author
A. Soloman, DO
Division of Gastroenterology, MetroHealth Medical Center, Case Western University
2500 MetroHealth Dr.
Cleveland
OH 44109
USA
Fax: +1-216-778-4873
asoloman@metrohealth.org