Answer to Photo Quiz: *Streptococcus pyogenes*

(See page 3109 in this issue [[doi:10.1128/JCM.02824-13](https://doi.org/10.1128/JCM.02824-13)] for photo quiz case presentation.)

Julie Hart,^a Paul Kruger,^b Paul R. Ingram^{a,c}

Department of Microbiology and Infectious Diseases, PathWest Laboratory Medicine, Royal Perth Hospital, Perth, WA, Australia^a; Department of Haematology, PathWest Laboratory Medicine, Royal Perth Hospital, Perth, WA, Australia^b; School of Pathology and Laboratory Medicine, University of Western Australia, Perth, WA, Australia^c

Figure 1 in the photo quiz demonstrates hypergranular, vacuolated neutrophils with intracellular cocci forming chains, resembling the genus *Streptococcus*. In light of the clinical features and blood film, a presumptive diagnosis of *Streptococcus pyogenes* toxic shock syndrome was made. Six hours following the blood film observation, growth of Gram-positive cocci in chains was detected in blood culture, which was subsequently confirmed to be *S. pyogenes*. As a result of the blood film findings, intravenous clindamycin was added; however, 19 h after presentation, the patient died of multiorgan failure.

The published literature suggests that observation of bacteria on routine blood film is rare; case reports involving *Capnocytophaga canimorsus* (1), *Citrobacter koseri* (2), and *Streptococcus pneumoniae* (3) have been described, plus a case series of four neonates involving *Staphylococcus aureus* and coagulase-negative staphylococci (4). A larger case series, published in 1966, reported 26 bacteremic patients with bacteria observed within leukocytes on routine blood films (*S. aureus*, *S. pneumoniae*, *Escherichia coli*, *Klebsiella pneumoniae*, *Neisseria meningitidis*, *Proteus* species, viridans group *Streptococcus*, beta-hemolytic *Streptococcus*, and “paracolon bacillus”) (5). To the best of our knowledge, this is the first case of *S. pyogenes* observed in a routine blood film. The high fatality rate among these published cases (24 of 33 patients died) (1–5) likely reflects the poor diagnostic sensitivity of blood films except in patients with very high bacterial loads observed during overwhelming septicemia, such as in our case. The use of buffy-coat smears may improve sensitivity (to a limit of detection of 10⁴ CFU/ml) but is labor- and time-consuming, prohibiting its routine use (6). Bacteria observed during routine blood film exami-

nation should be discussed immediately with the treating physician, as the result may be used to predict a microbiological diagnosis and assist with choice of empirical antimicrobial and adjunctive therapy and portends a poor patient outcome.

REFERENCES

1. Tay HS, Mills A, Bain BJ. 2012. Diagnosis from a blood film following dog-bite. *Am J Hematol* 87:915. <http://dx.doi.org/10.1002/ajh.23177>.
2. Fernando SL, Lehmann P. 2011. Bugs on film: the presence of bacterial rods (*Citrobacter koseri*) on a routine blood film in a septic immunocompromised patient with a femoral vein line. *Indian J Pathol Microbiol* 54: 840–841.
3. Lancashire J, Crowther M. 2012. Blood smear: fulminant pneumococcal bacteremia. *Blood* 120:4459. <http://dx.doi.org/10.1182/blood-2012-07-444406>.
4. Howard MR, Smith RA. 1999. Early diagnosis of septicemia in preterm infants from examination of peripheral blood films. *Clin Lab Haematol* 21:365–368. <http://dx.doi.org/10.1046/j.1365-2257.1999.00233.x>.
5. Smith H. 1966. Leucocytes containing bacteria in plain blood films from patients with septicemia. *Australas Ann Med* 15:210–221.
6. Reik H, Rubin SJ. 1981. Evaluation of the buffy-coat smear for rapid detection of bacteremia. *JAMA* 245:357–359. <http://dx.doi.org/10.1001/jama.1981.03310290025016>.

Citation Hart J, Kruger P, Ingram PR. 2015. Answer to photo quiz: *Streptococcus pyogenes*. *J Clin Microbiol* 53:3389. [doi:10.1128/JCM.02825-13](https://doi.org/10.1128/JCM.02825-13).

Editor: P. Bourbeau

Address correspondence to Julie Hart, julie.hart@health.wa.gov.au.

Copyright © 2015, American Society for Microbiology. All Rights Reserved.
[doi:10.1128/JCM.02825-13](https://doi.org/10.1128/JCM.02825-13)