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Medical Imagery

Purple urine in a patient after recovery from a SARS-CoV-2 infection



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A 96-year-old woman living in a nursing home was admitted to the university hospital Erlangen due to an infection with SARS-CoV-2. She presented with fever, coughing and reduced general condition. Under symptomatic therapy, the patient's condition improved. After 2 weeks, she developed fever again, and her urine turned purple (Figure 1).

Based on fever (39.2 °C), increased C-reactive protein levels (27.5 mg/L; upper limit of normal: 5 mg/L), leukocyturia, and detection of *Proteus mirabilis* in the urine culture, we diagnosed a urinary tract infection. In combination with purple urine, this diagnosis is typical for a purple-urine-bag-syndrome (PUBS) (Shiao et al., 2008). The purple color results from bacteria metabolizing indoxyl sulphate to indoxyl, which is oxidized to indirubin (red pigment) and indigo (blue pigment) (Kalsi et al., 2017). Immobility, advanced age and female gender are risk factors for urinary tract infections in general (Khan et al., 2011; Shiao et al., 2008). Our patient had constipation for several days, which leads to increased bacterial conversion of tryptophan to indole in the gut. Indole is absorbed through the intestine, metabolized in the liver to indoxyl sulphate, and excreted through the kidney, promoting PUBS occurrence. Others suggested that a lying urinary catheter also supports urine discoloration in PUBS (Kalsi et al., 2017).

Typical differential diagnoses include adverse effects of drugs (e.g. rifampicin), hematuria, rhabdomyolysis, porphyria, and the consumption of beetroot. We excluded these diagnoses by taking a medical history and through further laboratory diagnostics (Kalsi et al., 2017).

The urine color normalized after exchanging the urine bag and a calculated antibiotic therapy with piperacillin/tazobactam (4.5 g, 3 × per day). The patient was discharged after 5 days of antibiotic treatment, and no readmission was necessary.



Figure 1. Urinary catheter with purple urine.

In summary, PUBS represents an important differential diagnosis of urinary discoloration and indicates an existing urinary tract infection.

Availability of data and material

Not applicable.

Code availability

Not applicable.

Authors' contributions

MV wrote the first draft of the manuscript. All authors commented on previous versions of the manuscript. All authors read and approved the final version.

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None declare.

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Not applicable.

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