

# The Curious Case of Purple Urine

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### CASE REPORT

A 53-year-old female with a history of spina bifida, complicated by urinary retention requiring a chronic indwelling urinary catheter, presented with altered mental status. The urinalysis was positive for WBCs (28/hpf) and leukocyte esterase. The patient was found to have purple urine (Figure 1).

#### Purple Urine Figure 1

Figure 1: Purple urine noted in the patient's urine bag at the time of admission.

Urine culture grew *Proteus mirabilis*. Computerized tomography (CT) of the pelvis was concerning for right-sided staghorn calculi as well as dilated calyces in the right kidney and no evidence of underlying renal disease (Figure 2). The patient was started on appropriate antibiotic therapy with Ertapenem (MIC:  $\leq 0.5$  mcg/ml).

#### Purple Urine Figure 2

Figure 2: CT scan of the abdomen at the time of admission, showing right-sided staghorn calculi (white arrow). Additionally, dilated calyces seen in right kidney without findings of medical renal disease. Multiple renal calculi noted in left kidney.

### DISCUSSION

Purple urine syndrome is an uncommon phenomenon. Dietary tryptophan is metabolized in the gastrointestinal tract by bacteria to produce indole, which is then converted to indoxyl sulfate in the liver [1]. Specific bacteria, including *Providencia*, *Escherichia coli*, *Proteus mirabilis* and *Klebsiella pneumoniae*, are known to produce the enzyme, indoxyl phosphatase, which is

responsible for converting urinary indoxyl sulfate into indirubin and indigo [1-3]. Both of these compounds are responsible for red and blue colors, respectively, which then mix together in the urine to create a purple hue. Urinary catheters with polyvinyl chloride, alkaline urine, and chronic constipation are other risk factors for developing purple urine [4].

## CONCLUSION

Our case highlights the risk factors of both *Proteus mirabilis* infection and a chronic indwelling urinary catheter, resulting in purple urine syndrome. While purple urine syndrome remains a benign clinical finding and does not exacerbate the patient's medical condition, the underlying infection must be promptly addressed.

## CONFLICT OF INTEREST

The authors of this manuscript have no financial interest or any conflict of interest.

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