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A Rare Case: Purple Urine Bag Syndrome

Pınar Baydar Yucel[1], Başak Buldu[1], Mustafa Polat[1], Ali Karakus[1]

[1]Hatay Mustafa Kemal University, Faculty of Medicine, Department of Emergency Medicine, Hatay, Türkiye

ABSTRACT

Purple Urine Bag Syndrome (PUBS) is a rare condition resulting from the interaction of indigo (blue) and indirubin (red) pigments—produced via various metabolic pathways from tryptophan—with polyvinyl chloride (PVC) in urinary catheters. Constipation plays a significant role in the pathogenesis. In addition, it may occur in patients with urinary tract infections or those with long-term indwelling bladder catheters. Although it is generally a benign clinical condition, it may be an early indicator of a serious urinary tract infection.

Keyswords: Purple Urine Bag, Constipation, Urinary Tract Infection.

INTRODUCTION

Purple Urine Bag Syndrome (PUBS) is a rare condition resulting from the interaction between indigo (blue) and indirubin (red) pigments—derived from tryptophan via various metabolic pathways—and polyvinyl chloride (PVC) in urinary catheters. It was first described by Barlow in 1978 (1,2).

Tryptophan is metabolized by intestinal flora into indole, which is then conjugated in the liver to form indoxyl sulfate. This compound is excreted in urine and subsequently converted into indoxyl by sulfatase and phosphatase enzymes produced by colonizing bacteria within the urinary catheter. Oxidation of indoxyl leads to the formation of the pigments indigo (blue) and indirubin (red). Alkaline urine accelerates this oxidation process. When these pigments come into contact with plastic urine bags, especially those made of PVC, a purple discoloration of the urine bag occurs. These pigments do not cause purple discoloration in urine alone; however, upon exposure to air, they oxidize to form both indigo and indirubin, which then react with PVC materials, resulting in the characteristic purple hue (3).

Constipation plays a key role in the pathogenesis of PUBS. In addition, the syndrome is observed more frequently in patients with urinary tract infections (UTIs) and those with long-term indwelling bladder catheters. The most commonly isolated microorganisms in PUBS include Pseudomonas aeruginosa, Escherichia coli, Klebsiella pneumoniae, and Proteus mirabilis (4–7).

If the patient is symptomatic or exhibits systemic signs, a urine culture should be performed. In asymptomatic patients with only discoloration of the urine bag, the culture often reveals polymicrobial colonization, which may not require treatment (2).

Management of PUBS primarily involves controlling the underlying condition, replacing the urinary catheter, administering appropriate antibiotics for symptomatic UTIs, and ensuring proper urinary antisepsis (1–4).

CASE REPORT

A 63-year-old female patient with a known history of hypothyroidism and urinary incontinence presented to the emergency department for routine replacement of a long-term indwelling bladder catheter, which had been in place for approximately two years. She reported a 10-day history of constipation. The catheter had been replaced every 15 days. On admission, her general condition was good, and vital signs were as follows: temperature 36.5°C, blood pressure 120/80 mmHg, oxygen

Corresponding Author: Ali Karakus, e-mail: drkarakus@yahoo.com
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saturation 96%, pulse 85 bpm, and respiratory rate 16 breaths per minute. Physical examination was unremarkable, except for a distinct purple discoloration of the urine bag (Figure 1).

Laboratory results showed a white blood cell count of 5,000/μL (reference range: 4,000–10,000/μL) and a C-reactive protein (CRP) level of 3 mg/L (normal <5 mg/L). Urinalysis revealed a pH of 7.5, approximately 30 leukocytes per field, leukocyte esterase +2, and hemoglobin +1. Urine culture grew 100,000 CFU/mL of mixed bacterial species.

The patient's urinary catheter was replaced, and a consultation was requested from the urology department. Since the patient exhibited no systemic symptoms, a urine culture was obtained under appropriate conditions, and the discolored catheter was replaced. Upon resolution of the purple discoloration with the new catheter, empirical antibiotic therapy with ciprofloxacin was initiated for a suspected urinary tract infection. Additionally, the patient was advised to use laxatives and modify her diet to manage constipation. She was discharged in good condition.

Figure 1. Purple Discoloration of the Urine Bag

DISCUSSION

Although Purple Urine Bag Syndrome (PUBS) is a rare and generally benign condition, it should be recognized and evaluated due to its potential association with underlying infections and comorbidities. Several risk factors have been implicated in the development of PUBS, including long-term urinary catheterization, advanced age, female sex, dehydration, immobility, constipation, chronic kidney disease, alkaline or acidic urine, and the use of PVC-based urinary catheters and collection bags.

In addition to urinary tract infections, prolonged catheterization and constipation play significant roles in the pathogenesis of PUBS. Kumar et al. (2018) reported PUBS in two bedridden female patients with chronic constipation and indwelling urinary catheters, attributing the condition to polymicrobial urinary tract infections, primarily involving gram-negative bacteria. The microorganisms most frequently isolated from urine cultures in PUBS cases include Providencia stuartii, Providencia rettgeri, Proteus mirabilis, Pseudomonas aeruginosa, Klebsiella pneumoniae, Escherichia coli, Morganella morganii, Citrobacter spp., Enterococcus spp., and group B Streptococcus (8).

Mızrak et al. (2017) described a case of PUBS in a hospitalized patient with chronic kidney disease following constipation during a hospital stay due to cerebrovascular disease (9). Similarly, Koçoğlu et al. (2016) reported PUBS in a male patient with an indwelling catheter due to benign prostatic hyperplasia and undergoing hemodialysis for chronic kidney disease (7).

In our case, consistent with the literature, PUBS developed in a female patient with a long-term urinary catheter and a history of constipation. The patient's urine was alkaline, and the urine culture yielded mixed bacterial growth, both of which are considered contributing factors to PUBS. The condition was managed conservatively without unnecessary medical interventions or hospitalization, emphasizing the importance of appropriate clinical judgment in such cases.

CONCLUSION

This case highlights Purple Urine Bag Syndrome (PUBS), a rare and typically benign condition that may nonetheless appear alarming to both patients and healthcare providers. Although PUBS itself is usually not life-threatening, it should prompt evaluation for underlying urinary tract infections, especially in patients with comorbidities. Clinicians should be aware that in immobilized patients with chronic illnesses, particularly those experiencing constipation, PUBS can develop as a result of multiple predisposing factors. Recognizing this condition can help avoid unnecessary interventions while ensuring appropriate management of potential infections.

DESCRIPTIONS

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REFERENCES

1. Al Montasir A, Al Mustaque A. Purple urine bag syndrome. J Family Med Prim Care. 2013;2(1):104–105.

2. Khan F, Chaudhry MA, Qureshi N, Cowley B. Purple urine bag syndrome: A disturbing hue? A brief review of the literature. Int J Nephrol. 2011;2011:419213.

3. Worku DA. Purple urine bag syndrome: an unusual but important sign of urinary tract infection. A case report and literature review. SAGE Open Med Case Rep. 2019;7:2050313X18823105.

4. Van Keer J, Detroyer D, Bammens B. Purple urine bag syndrome in two elderly male patients with urinary tract infection. Case Rep Nephrol. 2015;2015:746981.

5. Traynor BP, Pomeroy E, Niall D. Purple urine bag syndrome: a case report and literature review. Oxf Med Case Reports. 2017;2017(11):omx059.

6. Kalsi DS, Ward J, Lee R, Handa A. Purple urine bag syndrome: a rare spot diagnosis. Dis Markers. 2017;2017:9131872.

7. Kocoglu H, Yildirim B, Okuturlar Y, Hursitoglu M, Harmankaya O. Purple urine bag syndrome in a male patient undergoing chronic hemodialysis. Balkan Med J. 2016;33(6):717–718.

8. Kumar D, Donga N, Macwan R. Purple urine bag syndrome: a frightening but easily manageable condition in a patient with a long-term indwelling urinary catheter. Indian J Palliat Care. 2018;24(4):534–536.

9. Mizrak M, Mizrak ÖY, Çelikbilek N, Başar E, Kocaaga M. Purple urine bag syndrome: a rare clinical case. Mikrobiyol Bul. 2019;53(4):457–463.