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Purple Urine Bag Syndrome: A Case Report

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ABSTRACT

Purple urine bag syndrome (PUBS) is a rare condition characterized by purple discoloration of the urinary drainage system. PUBS may be alarming for healthcare professionals and patients' relatives. PUBS is characterized by the production of indigo (blue) and indirubin (red) pigments by colonized bacteria in indwelling urinary catheters of patients. Contact of these pigments with a urinary catheter or a plastic urine bag made from polyvinyl chloride causes purple discoloration of the urine. In this case report, we aimed to present the PUBS developing in a patient who had a history of breast cancer, chronic renal failure, stroke and hypertension and a long-term indwelling urinary catheter.

Keywords: Urine, urinary tract infections, urinary catheterization



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INTRODUCTION

The macroscopic examination has an important place in urine tests in patients with urinary catheterization.^[1] A change in the urine color is accepted as an important clinical symptom to be considered in the differential diagnosis of many pathological conditions including urinary system infections, hematuria, urinary system malignancies, and drug side effects. Purple urine bag syndrome (PUBS) is a rare condition characterized by purple discoloration of the urinary drainage system. PUBS may be alarming for healthcare professionals and patients' relatives.^[2] PUBS is characterized by the production of indigo (blue) and indirubin (red) pigments by colonized bacteria in indwelling urinary catheters of patients. Contact of these pigments with a urinary catheter or a plastic urine bag made from polyvinyl chloride (PVC) causes purple discoloration of the urine.^[3] Commonly isolated bacterial species include *Proteus mirabilis*, *Escherichia coli*, and *Morganella morganii*. Less commonly were *Klebsiella pneumoniae*, *Providencia stuartii*, *Providencia rettgeri*, *Enterococcus* spp, *Serratia marcescens*, and *Pseudomonas aeruginosa*, as well as some fungi species such as *Candida albicans*, are isolated.^[1,3,4] The etiology of PUBS includes recurrent urinary tract infections, comorbid diseases, chronic constipation, female gender, old age, renal failure, long-term catheterization with a catheter made up of PVC, diets rich in tryptophan, and alkaline urine.^[5]

The aim of this case report was to evaluate PUBS developing in a patient, who had a long-term indwelling catheter and received home healthcare services.

CASE REPORT

An 85-year-old female patient with a history of breast cancer, chronic renal failure, stroke, and hypertension became bedridden last year. The patient was registered to Samsun Home Health Services. The patient had left hemiplegia. The patient had a long-term indwelling catheter because of having a neurogenic bladder. Because the patient frequently developed symptoms and complaints of urinary infection, the patient was followed up with periodic urine tests and received antibiotherapy. Recently, patient relatives presented with the complaint of discoloration of the urine bag of the patient. Consequently, the patient was visited at home. The patient's temperature was 36.6°C, pulse rate was 76 beats/min (regular rhythm), blood pressure was 130/90 mmHg, and oxygen saturation was 98% in room air. The general condition of the patient was good, and she was conscious.

There was no additional pathological finding was detected in physical examination. When the urine bag was examined, it was seen that the urine was purple (Fig. 1). Urine samples were taken from the urine bag to perform a complete urine analysis and urine culture. The complete urinalysis test results are summarized in Table 1. *Escherichia coli* (susceptible to ampicillin, amoxicillin-clavulanic acid, cefuroxime, cefuroxime axetil, gentamicin, fosfomycin, nitrofurantoin, and trimethoprim-sulfamethoxazole) was detected in the urine culture. After the patient started treatment for the

urinary tract infection, her urine color gradually improved within a few days.

DISCUSSION

Urinary catheterization is widely used in many clinical settings. Therefore, it is important to raise awareness about possible complications associated with its use. People with long-term indwelling urinary catheters are prone to urinary tract infections. The neurogenic bladder caused by the cerebrovascular disease in the patient resulted in the need for long-term indwelling urinary catheterization. The presence of indwelling catheters, female gender, history of urinary infections, and chronic diseases such as renal failure were the risk factors that PUBS in the patient. It has been reported in the literature that 10% of long-term care patients with permanent urinary catheterization are at risk of developing PUBS.^[6] The course of the syndrome is generally benign, but it is associated with higher morbidity and mortality compared to having a urinary tract infection alone.^[6,7] Al Montasir et al. reported PUBS in an 86-year-old female patient, who was immobilized due to osteoporosis and bilateral femur fractures. *Escherichia coli* growth occurred in the urine culture.^[8] Carmo et al. reported in 2019 from Brazil that PUBS occurred in a 65-year-old male patient who developed Fournier's gangrene due to trauma to the hip and pelvis. The patient had a long-term indwelling urinary catheter and *Proteus mirabilis* was grown in the urine culture.^[7] Mizrak et al. reported that PUBS developed



Figure 1. Purple discoloration in urine color.

Table 1. The complete urinalysis test results of the patient

Parameters	Results (Normal range)
Hemoglobin	Negative
pH	6.0
Clarity	Clear
Color	Dark amber
Specific gravity	1015
Glucose	Negative
Ketones	None
Nitrites	Negative
Leukocyte esterase	Negative
Protein	Negative
Bilirubin	Negative
Leukocyte (/HPF)	10 (0-4)
Erythrocyte (/HPF)	2 (0-3)
Bacteria (/HPF)	53
Squamous epithelial cells (/HPF)	1 (5-15)
Crystals	Negative

HPF: Per high power field.

in a 60-year-old female patient approximately 10 days after urinary catheter insertion following intracranial bleeding and immobilization. Enterococcus faecalis growth occurred in the urine culture.^[2]

CONCLUSION

PUBS has a good prognosis when it exists alone. However, it is a rare clinical condition that should be kept in mind because the underlying clinical factors and urinary infections can cause significant morbidity and mortality and may be worrisome for persons, who do not know the condition and causes.

Disclosures

Informed Consent: Written informed consent was obtained from the patient's family for the publication of the case report, since the patient had mild cognitive impairment.

Conflict of Interest: None.

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lection &/or processing – N.Ş.Y.; Analysis and/or interpretation – M.Ç., E.Ö.; Literature search – N.Ş.Y.; Writing – N.Ş.Y.; Critical Review – M.Ç., E.Ö.

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