

Case Report

Purple urine bag syndrome: an unusual clinical presentation

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ABSTRACT

Purple Urine Bag Syndrome (PUBS) is a rare presentation of urinary tract infection caused by certain bacteria that produce sulphatases and phosphatases that bring about metabolism of tryptophan, leading to production of pigments indigo and indirubin that together impart purple colour of urine. It is a benign condition, most often associated with long term urinary catheterization, renal diseases, chronic constipation and female gender. Commonly implicated organisms include *Proteus mirabilis*, *Klebsiella pneumoniae*, *Providencia stuartii*. Diagnosis is made on urinary culture. Treatment includes reassurance and antibiotics for UTI. We present a case of purple urinary bag syndrome in a female patient of carcinoma stomach presenting with gastric outlet obstruction.

Keywords: *Klebsiella pneumoniae*, Purple urinary bag syndrome, *Providencia stuartii*, Tryptophan metabolism, *Proteus mirabilis*, Urinary Tract Infection

INTRODUCTION

Purple Urine Bag Syndrome, is an uncommon condition. It is due to metabolism of tryptophan by certain bacterial enzymes producing indigo and indigorubin that together impart purple colour to the urine.¹ Diagnosis depends on visual confirmation and urinary culture implicating causative organism.² Several gram negative bacteria have been implicated. It has a female preponderance, with higher incidence seen in debilitated patients, patients with renal failure, chronic constipation, immunocompromised status. Treatment includes catheter care, antibiotic prophylaxis and treatment of underlying cause.³

CASE REPORT

A 69 year old female presented with complaints of burning micturition since 20 days, pain in abdomen since 2 weeks, vomiting and loss of appetite since 2 weeks. Patient was post-menopausal without any co morbidities. On examination, patient was conscious, oriented, thin built and poorly nourished. She had a resting pulse rate of

100 beats per minute, with systolic blood pressure in right arm 90/70 mmHg. She was pale, with palpable left supraclavicular lymph node. Abdominal examination revealed a 11x8 cm mass in epigastrium, hard in consistency with irregular margins. Rest of the general and systemic examination was unremarkable.

Blood investigation revealed anemia, hypoproteinemia, hypokalemia and hyponatremia. Patient was given fluid resuscitation. Ryle's tube was inserted, stomach contents aspirated (300 ml of bile and food particles). Foley's catheter was inserted. One week after insertion of catheter, urine in the bag turned purple. Patient was initially misdiagnosed as porphyria. Catheter was changed, antibiotics were started as per culture sensitivity. A one week course of ciprofloxacin was given. Colour of urine changed to normal in 2 days. Patient was diagnosed with Adenocarcinoma stomach with gastric outlet obstruction on Gastroscopy with biopsy and CT scan abdomen. Patient underwent Exploratory Laprotomy with Distal Gastrectomy with Gastrojejunostomy. Patient died on Post-Operative Day 4

due to aspiration pneumonia with sepsis, contributory factors including hypoalbuminemia and cachexia (Figure 1, 2 and 3).



Figure 1: Purple urine in bag.



Figure 2: Purple urine in catheter tubing.



Figure 3: Purple urine on gauze (2 hours later).

DISCUSSION

First case of PUBS was reported in 1978.⁴ However, it was first seen in King George, The third in 1812.⁵ Reported prevalence of 8.3-16.7% from a series of 157 patients with urinary catheters, 13 of whom had PUBS.⁶ It is a rare spot diagnosis. It is caused by Urinary Tract Infection by certain organisms that metabolise tryptophan into blue and red pigments. Normally, tryptophan is deaminated to indole by gut flora. Indole is conjugated to indoxyl sulphate in portal circulation which is secreted into urine. Certain sulphatase and phosphatase producing bacteria convert it into indoxyl. Indoxyl is converted to indigo (blue) and indirubin (red) by oxidation, which reacts with catheter tube to produce purple colour.⁷ Causative organisms implicated are *Proteus mirabilis*, *Escherichia coli*, *Klebsiella pneumoniae*, *Providencia stuartii*.⁸ It is more common in females, often seen at extremes of age, constipation is a predisposing factor as it increases colonic transit, it favours alkaline urine, although it can occur in acidic urine as well, chronically ill patients, patients with renal dysfunction.^{9,10} It can occur within hours of catheter insertion or after a few days. It is often misdiagnosed as porphyria, food dyes, drugs like indomethacin and flutamide.¹¹ Diagnosis depends on urine routine examination and urine culture, dipstick test, serum urea and electrolytes as there is often associated dehydration.

PUBS is a benign condition and doesn't have any prognostic implications. It still has a higher morbidity than UTIs as it can be often be the rare first sign of certain conditions like Fournier's Gangrene and vulvar abscess.¹² There isn't any specific protocol for treatment. Reassurance of patient, patient education on catheter care, antibiotic therapy and catheter care form mainstay of treatment. Management also includes treatment of underlying cause.

CONCLUSION

Purple Urine Bag Syndrome is a rare spot diagnosis. It occurs due to urinary tract infection with certain gram negative bacteria. It is often misdiagnosed as a drug reaction or porphyria. Treatment includes reassurance, antibiotic prophylaxis and catheter care.

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