Introduction

- Urinary tract infections (UTIs) are a common occurrence in adults who are chronically catheterized.1
- Normal gut flora metabolizes tryptophan into indole, which is absorbed by the liver and further converted to indoxyl sulfate. When indoxyl sulfate is metabolized with alkaline urine, it oxidizes and forms indigo and indirubin, giving the urine a purple hue when mixed with the polyvinyl chloride plastic of the catheter bag.1
- Risk factors for developing urinary tract infections include irregular catheter exchange and long-term catheterization.1
- Most cases of UTIs occur concurrently with alkaline urine. Few cases have been reported with acidic urine, and these patients present with multiple other risk factors.2

History of Present Illness

"My urine is purple!"

- A 63-year-old Caucasian male with a complex past medical history including subdural hematoma with residual right sided hemiparesis requiring long term urinary decompression with a suprapubic catheter which has been complicated by chronic infections presented to the emergency department with abdominal pain and "purple urine."
- He reported that he noticed abdominal discomfort, particularly suprapubic discomfort, and then noticed that his urine turned to a purple hue.
- He denied any prior history of this occurring.
- He denied any associated symptoms including no fevers, chills, nausea, vomiting, or flank pain.

Physical Exam


Medical History

- Illnesses:
  - Aphasia
  - BPH with elevated PSA
  - Congestive heart failure
  - Chronic suprapubic catheter
  - Hypertension
  - Gastroscopy tube
  - GERD
  - Hypercholesterolemia
  - Hyperlipidemia
  - Cardiomyopathy
  - Pulmonary embolism
  - Subdural hematoma
  - Suprapubic tachycardia

- Medications:
  - amantadine HCL
  - carbidilol
  - sacubitril/valsartan
  - atorvastatin
  - acetaminophen
  - bicalon
  - bisacodyl
  - citalopram
  - melatonin
  - metoclopramide
  - oxycodone
  - polyethylene glycol
  - senna-docusate

Surgical History

- Cardiac defibrillator placement
- Colonoscopy
- IVC filter placement
- Left decompressive hemianctomy
- Suprapubic catheter placement

Diagnostic Testing and Results

CBC, BMP, LFTs WNL

Urine analysis: + pyuria, + bacteriuria, many triple phos crystals noted

Urine Culture: + for Providencia retgeri and Morganella morganii; sensitive to sulfaethoxazol-trimethoprim

Pathological Examination:

- Suprapubic catheter immediately changed
- Oral double strength sulfamethoxazol-trimethoprim was initiated for 7 days total
- Educated patient and caregiver on importance of monthly catheter exchange to prevent recurrent infection.

Conclusion

- Most associated microorganism isolated in PUSB was E. coli.3
- Possible misdiagnoses of purple urine include hematuria, hemorrhoburia, myoglobinuria, nephrolithiasis, food dyes, and drug reactions.4
- Treatment occurs in 3 steps: treating the UTI, treating the constipation, and sanitation efforts including catheter replacement.4
- Fournier’s gangrene can be caused by PUBS.5
- Non-plastic catheter bags could be an option to prevent PUBS from developing.4
- As the population ages, patients continue to develop comorbid conditions, including those that predispose them to PUBS (dementia, constipation, renal failure).3
- PUBS can result even with absence of fever or dysuria.6
- The Oxford Urine Chart illustrates the different causes of each color that may be seen. On this chart, PUBS is the only cause for a purple hue listed.3
- Antibiotic stewardship is even more necessary to prevent resistant infections.6
- While constipation can be a risk factor for PUBS, laxatives or suppositories can be damaging to the gut mucosa.5
- Chronic kidney disease can lead to uremia, which provides a better environment for indican to be derived. Transit of urine also is slowed in CKD, leading to more concentrated urine with indican in it.3

Figure 1: etiology of purple urine bag syndrome

Figure 2: Oxford Urine Chart

References