

# **An Association of Purple Urine Bag Syndrome with**

## **Intussusception – A Case Report**

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### **Abstract:**

We report a case of an elderly lady with a long term suprapubic catheter who developed purple discoloration of the urine around the same time as she developed intussusception. Purple urine bag syndrome is a benign condition known to be associated with intestinal stasis. However this association with intussusception should be kept in mind before reassuring the patient.

### **Introduction:**

Purple urine bag syndrome (PUBS) is an uncommon condition characterised by purple discolouration of disposable plastic catheter bags and tubing. This is a benign condition usually seen in elderly women with poor mobility who have been catheterised long term. It is associated with constipation and colonisation of the urinary tract with certain organisms. This is the first report, to our knowledge, of PUBS associated with intussusception.

**Case report:**

A 76 year old lady with diabetes, parkinson's disease, hypertension, asthma, depression and previous history of two cerebrovascular accidents was brought to the hospital with decreased swallowing, weight loss, and dark coloured urine. She had ongoing persistent constipation which had worsened recently. Her urinary incontinence had been managed with suprapubic catheterisation for over a year. She was severely demented and practically immobile.

On examination she had a mildly raised temperature of 37.2 degrees Celsius and a mask like facies. Palpation of the abdomen showed a sausage shaped mass extending from the right iliac fossa to the right hypochondrium. We also noticed a purple-blue discoloration of her catheter bag and tubing. Her husband told us that the hue had been becoming darker over the past few days. Her supra pubic catheter had been replaced only two weeks back. Routine blood investigations revealed a high C-reactive protein and microcytic anaemia. Urinalysis showed leucocytes, protein and 4+ nitrates. Urine culture showed a heavy growth of mixed organisms.

Abdominal sonography revealed a complex mass in the right hypochondrium. Tumour markers were not elevated. CT abdomen was done which showed bowel within bowel appearance and a coiled spring appearance suggestive of intussusception. She was reviewed by general surgeons who felt that operative intervention would not be appropriate considering her co-morbidities. However, within a few days the mass resolved, suggesting intermittent intussusception. We changed her catheter and she started draining clear urine.

**Discussion**

Purple urine bag syndrome is due to dissolution of indurubin in the plastic of the urinary bag and coating of indigo on its surface<sup>1,2</sup>. Indirubin and indigo are products of

enzymatic degradation of urinary indoxyl sulphate by sulphatase producing bacteria such as *Providencia stuartii* in the urinary tract<sup>1</sup>. Indoxyl sulphate is in turn, the by product of indole metabolism in the liver. Excess indole is absorbed into the portal system by bacterial degradation of tryptophan in the gut. Factors leading to increased bacterial degradation are bacterial overgrowth and intestinal stasis<sup>1,3</sup>.

While urinary colonisation with bacteria which have indoxyl sulphatase (IS) activity (*Providencia stuartii*, *Klebsiella pneumoniae*) is probably necessary for the purple discoloration, various bacteria, including those without sulphatase activity have been isolated from the urine of patients. These include *Escherichia Coli*<sup>2,3</sup>, *Providencia rettgeri*<sup>4</sup>, *Pseudomonas aeruginosa*<sup>5</sup>, *Pseudomonas mirabilis*<sup>5</sup>, *Morgenella morgani*<sup>5</sup>, *Alcaligenes spp.*<sup>6</sup> and *Proteus vulgaris*<sup>2</sup>. The recurring concepts have been alkaline urine<sup>3,4,5,7</sup>, high bacterial counts<sup>7,8</sup> and long term urinary catheterisation<sup>6,7</sup>. This probably relates to the fact that the IS positive bacteria are also commonly urease producing, thus leading to an alkaline urine<sup>1</sup>. The isolation of many other types of bacteria does not necessarily point to causation<sup>7,8</sup>. Instead, this is most likely due to the polymicrobial colonisation of instrumented urinary tracts. However, the association of chronic catheterisation with PUBS suggests that IS producing bacteria are more liable to colonise instrumented urinary tracts.

The other important association with PUBS is constipation. This is probably because slow intestinal motility promotes bacterial overgrowth<sup>2</sup>, more tryptophan is metabolised to indole and absorbed into portal circulation (and consequently there is decreased serum tryptophan<sup>9</sup>). It has been theorised that PUBS is associated with intestinal overgrowth of 'aerobacteria' like *Escherichia Coli* rather than 'anaerobacteria' such as *Bifidobacteria spp.*<sup>3</sup>. Whatever the pathogenesis, constipation and bacterial overgrowth in the gut has been almost always associated with PUBS<sup>2,6,8</sup>. The sudden occurrence of PUBS in our patient who is both chronically catheterised and constipated was a suspicious occurrence signifying further

decreased intestinal motility. Indeed CT scanning revealed intestinal obstruction due to intussusception. Fortunately this resolved by itself.

PUBS has long been regarded as a benign condition. However, when this occurs without any explanation, intestinal obstruction due to any cause should be suspected.

### **References:**

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**Legend For Figure:**

Purple discoloration of urinary catheter and urine bag in PUBS.