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Vaka Sunumu / Case Report

Purple Urine Bag Syndrome in Two Elderly Patients with Urinary Tract Infection

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Abstract:
Purple Urine Bag Syndrome (PUBS) is a rare manifestation of urinary tract infection (UTI). Purple urine color is a result that a chemical reaction between plastic and certain bacterial enzymes. PUBS is a benign condition and patients are usually asymptomatic. The common risk factors are old age, females, constipation, alkaline urine and usage of plastic urinary catheters. In this case report, we aimed to indicate that the purple discoloration of urine is a benign condition showing underlying UTI.
Key words: *Purple urine bag syndrome, urinary cathater, urinary tract infection*

Özet:
Üriner Yol Enfeksiyonu Olan İki Yaşlı Hastada Mor İdrar Sendromu
Mor idrar sendromu, üriner yol enfeksiyonlarının nadir bir bulgusudur. İdrarın mor rengi, plastik ile belirli bazı bakteriyel enzimler arasındaki bir kimyasal rekasiyonun sonucunda ortaya çıkar. Mor idrar, benign bir durumdur ve hastalar sıklıkla asemptomatiktir. İleri yaş, kadın cinsiyet, kabızlık, alkali idrar ve plastik idrar torbalarının kullanımı en sık risk faktörleridir. Bu vaka sunumunda, altta yatan üriner yol enfeksiyonunun bir göstergesi olan idrar renginin mor olması durumuna dikkat çekmek istedik.
Anahtar kelimeler: *Mor idrar sendromu, üriner katater, üriner yol enfeksiyonu*

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INTRODUCTION

Purple Urine Bag Syndrome (PUBS) is a rare manifestation of urinary tract infection (UTI) [1]. Purple urine color is a result that a chemical reaction between plastic and certain bacterial enzymes [2]. The purple color is thought to be caused by bacterial metabolization of dietary tryptophan into indigo and indirubin inside the urinary catheter system [3].

PUBS is a benign condition and patients are usually asymptomatic.The common risk factors are old age, females, constipation, alkaline urine and usage of plastic urinary catheters [4].

In this case report, we aimed to indicate that the purple discoloration of urine is a benign condition showing underlying UTI.

CASE REPORTS

Case 1

A 96 years old woman was brought to the hospital for dark urine for the last 4 days. She had had only Alzheimer disease. She had bladder tube for two mounths for urinary incontination. Vital signs were: fever 36,7 °C, BP: 146/68 mmHg, HR: 78 bp/min, spO2: 92 %, Glascow Coma Scale (GKS) was 15. The patient had not taken drug or eaten food that could affect color of urine; but patient urine color changed into the purple color spontaneously (Figure 1) [her initial urine output color was normal (Figure 2)]. Laboratory blood tests showed: WBCs 5,5 K/uL, neutrophils 72,1 %, haemoglobin (HGB) 8,87 g/dl, platelet(PLT) 273 K/uL, LDH 160 U/l, liver function tests were within normal range, total bilirubin 0.21 mg/dl, urea 40,66 mg/dl, creatinine 0,68 mg/dl, albumin 3,5 mg/dl, erythrocyte sedimentation rate 32 mm/h and CRP 0,8 mg/dl. There was normal radiography. Urinalysis showed 157 RBCs, pyuria (22 wbc / high power field), pH>9, and nitrite +.

Case 2

A 89 years old man was brought to the our hospital for change of his urinary catheter. His past medical history included hypertension, serebrovasculer accident and prostate hypertrophy. He had bladder tube for 25 days for prostatic disease. Vital signs were: fever 36,4 °C, BP: 140/71 mmHg, HR: 73 bp/min, spO2: 96 %, GKS was 15. This patient had not taken drug or eaten food that could affect color of urine, too; but patient

urine color changed into the purple/green color spontaneously (Figure 3). Laboratory blood tests showed: WBCs 9,67 K/uL, neutrophils 76,7%, HGB 12 g/dl, PLT 220 K/uL, liver function tests were within normal range, urea 42,8 mg/dl, creatinine 0,74 mg/dl, CRP 5,6 mg/dl. Urinalysis shows 371 RBCs, pyuria (119 wbc / high power field), pH 5, and nitrite +. Urine culture sent for both two patients, ampirical antibiyotherapy (phosphomycin) was initiated and discharged from our emergency department. One week later, urine color were normal while kidney function were normal and they were afebrile. There was no complication.

Figure 1. *A 96 year-old woman's bladder tube.*

Figure 2. *Inıtial urine output color after changing of the foley.*

Figure 3. *A 89 year-old mans's bladder tube.*

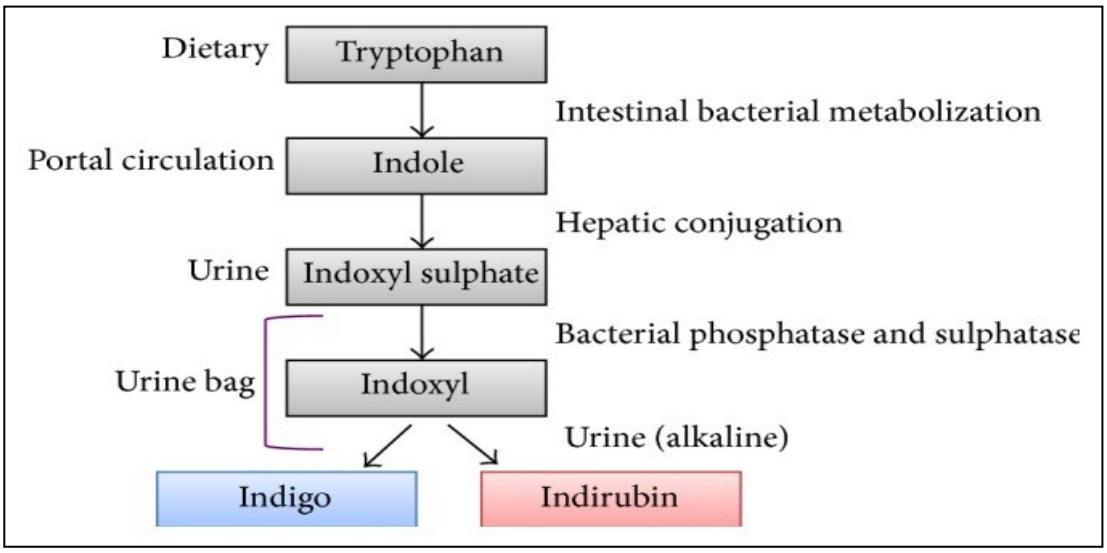

Figure 4. *Pathogenesis of the purple urine bag syndrome (Adapted from Hadano et al [7]).*

DISCUSSION

This rare condition may cause anxiety to medical/nonmedical personel or patients and patient's relatives [5]. PUBS is a rare condition that can seem alarming, but it is mostly benign. The syndrome was first described in 1978 [6]. Since then, less than 100 cases have been published. Most are institutionalized female patients with chronic indwelling urinary catheters. PUBS is associated with UTI and with constipation [7]. The pathogenesis is controversial. According to the most popular hypothesis [3] dietary tryptophan is converted to indole by gut bacteria, which is further metabolized in the liver

to indoxyl sulphate and then excreted in the urine. Constipation favors conversion of tryptophan to indole by gut bacteria [8]. Once excreted, indoxyl sulphate can be processed by bacteria colonizing the urinary catheter to indoxyl, which is further converted to indigo (blue) and indirubin (red).

These pigments result in a deep purple color in interaction with the plastic tubing (Figure 4). The most commonly involved bacteria are Providencia stuartii and rettgeri, Escherichia coli, Klebsiella pneumoniae, Pseudomonas aeruginosa, Morganella morganii, Proteus mirabilis and Enterococcus species [9]. These bacteria produce indoxyl phosphatase and sulphatase enzymes. Although alkaline urine is an important risk factor, PUBS has been described in acidic urine as well [10]. Our case shows that the discoloration only occurred after contact with the plastic bag.

PUBS is a sign of colonization of the urinary catheter system. Antibiotic therapy is only indicated in patients with symptomatic urinary infection. For asymptomatic patients, treatment of underlying risk factors (e.g., constipation) might suffice [11]. The mainstay of preventing PUBS is the avoidance of chronic catheterization by prompt removal of urinary catheters once they are no longer needed [8].

CONCLUSION

Physicians should be aware of this phenomenon that indicates an underling UTI due to improper care of urinary catheters.

REFERENCES

1. *Lin HH, Li SJ, Su KB, Wu LS. Purple urine bag syndrome: A Case Report and Review of the Literature. J Intern Med Taiwan. 2002; 13: 209-212.*
2. *Chassin-Trubert C AM. Purple urine bag syndrome: report of one case. Rev Med Chil. 2014 Nov;142(11):1482-4.[Abstract]*
3. *Dealler S. F., Hawkey P. M., Millar M. R. Enzymatic degradation of urinary indoxyl sulfate by Providencia stuartii and Klebsiella pneumoniae causes the purple urine bag syndrome. Journal of Clinical Microbiology. 1988;26(10):2152–2156.*
4. *Abubacker NR, Jayaraman SM, R K, Sivanesan MK, Mathew R. J Clin Diagn Res. 2015 Aug;9(8):OD01-2)*
5. *Agapakis DI, Massa EV, Hantzis I, Paschoni E, Satsoglou E. Purple Urine Bag Syndrome: a case report of an alarming phenomenon. HIPPOKRATIA 2014, 18, 1: 92-94.*
6. *Barlow G. B., Dickson J. A. S. Purple urine bags. The Lancet. 1978;311(8057):220–221. doi: 10.1016/s0140-6736(78)90667-0. [Cross Ref]*

7. *Hadano Y., Shimizu T., Takada S., Inoue T., Sorano S. An update on purple urine bag syndrome. International Journal of General Medicine. 2012;5:707–710. doi: 10.2147/ijgm.s35320. [PMC free article] [PubMed] [Cross Ref]*
8. *Jan Van Keer, Daan Detroyer, and Bert Bammens. Purple Urine Bag Syndrome in Two Elderly Men with Urinary Tract Infection. Case Rep Nephrol. 2015; 2015: 746981.*
9. *Su F.-H., Chung S.-Y., Chen M.-H., et al. Case analysis of purple urine-bag syndrome at a long-term care service in a community hospital. Chang Gung Medical Journal. 2005;28(9):636–642. [PubMed]*
10. *Mantani N., Ochiai H., Imanishi N., Kogure T., Terasawa K., Tamura J. A case-control study of purple urine bag syndrome in geriatric wards. Journal of Infection and Chemotherapy. 2003;9(1):53–57. doi: 10.1007/s10156-002-0210-x. [PubMed] [Cross Ref]*
11. *Lin C.-H., Huang H.-T., Chien C.-C., Tzeng D.-S., Lung F.-W. Purple urine bag syndrome in nursing homes: ten elderly case reports and a literature review. Clinical Interventions in Aging. 2008;3(4):729–734. [PMC free article] [PubMed]*