



**ORIGINAL RESEARCH PAPER**

**Pulmonary Medicine**

**PURPLE THORACOSTOMY TUBE: A CASE REPORT**

**KEY WORDS:** Purple urinary bag syndrome (PUBS), Chest tube drain, Klebsiella pneumoniae

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**ABSTRACT**

52-year-old male patient with bilateral pleural effusion with massive effusion on the right was placed with chest tube drain. On day four after chest tube placement, an unusual purple discoloration was observed along the tube connected to the drain bag. Klebsiella pneumoniae was the pathogen identified from culture of the sample collected from the tube. Similar purple discoloration had been reported in multiple cases of Purple urinary bag syndrome (PUBS). We believe the purple discoloration in this case is multifactorial with similar biochemical mechanism as seen in PUBS. This observation is of importance to clinicians and its awareness would further advance for a better management of the patient and their concerns in similar clinical scenario.

**Case report:**

52-year-old male patient with bilateral pleural effusion with massive effusion on the right side was admitted under pulmonary medicine department. He had complaints of shortness of breath, cough and loss of appetite for one month. He also gave history of difficulty in passing stools from couple of weeks. On examination he had pallor with severe muscle wasting, chest examination showed classical findings of pleural effusion and baseline oxygen saturation at room air was mildly decreased. Therapeutic and diagnostic thoracentesis was performed. Pleural fluid was haemorrhagic with exudative findings and low ADA. Cytology was showing lymphocytic predominance with no evidence of malignant cells. Serum Carcinoembryonic antigen (CEA) and prostate specific antigen (PSA) were low. Echocardiograph showed no evidence of cardiac failure with renal and hepatic parameters within normal limits.

Large-bore chest tube (32F) drain was placed on the right, and two days following the insertion with significant reduction of effusion, a non-contrast CT thorax was performed which showed hilar adenopathy and findings consistent with tuberculosis. Anti-tubercular therapy with conventional regimen was initiated to the patient and was being well tolerated. On day four after chest tube placement there was an unintended partial tube dislodgement which was confirmed with a chest radiograph. An unusual purple discoloration (Figure 1) was observed along the tube connected to the drain before planning for a removal. Haematological investigations when repeated showed marked leucocytosis with neutrophilia. Pleural fluid sample was collected (Figure 2) from the purple-coloured part of the tube by carefully clamping and sent for bacteriological culture. The obtained pleural fluid sample was haemorrhagic and was similar to that of the fluid collected in the chest tube bag. The culture report yielded Klebsiella pneumoniae and sensitivity guided antibiotic therapy was initiated. Chest tube was removed. Patient was followed up subsequently and was well responding to the therapy.

**Discussion:**

Similar purple discoloration had been reported in multiple cases of Purple urinary bag syndrome (PUBS). Purple urine bag syndrome (PUBS) is referred to a propitious condition caused by increased levels of indigo and indirubin, two pigments related to metabolism of the amino-acid tryptophan. Its existence is related mostly to urinary tract infections (UTI). (1) Tryptophan is metabolized in the gastrointestinal tract by gut bacteria and it produces indole that is absorbed into portal circulation. Indole is converted into indoxyl sulphate in the liver. Most indoxyl sulphate is excreted into the urine and digested into indoxyl by indoxyl-

sulphatase produced by some bacteria. Indoxyl turns into indigo (blue colour) and indirubin (red colour) in alkaline urine, and these colours then mix to form a purple colour. (2) PUBS is most often observed in chronically catheterized and constipated people. Several bacterial species have been reported in association with PUBS including Providencia stuartii, Providencia rettgeri, Klebsiella pneumoniae, Proteus species, Escherichia coli, Enterococcus species, Morganela morganii, and Pseudomonas aeruginosa. (3,4) Numerous factors have been associated with purple discoloration of urine. The most important are advanced age, female gender, constipation, dementia, bedridden situation, institution-alization, end-stage renal disease, dehydration, chronic catheterization, use of polyvinyl chloride urinary catheter or bag, recurrent UTI, high urinary bacterial counts and alkaline urine. (5) The differential diagnosis includes haematuria, porphyria, alkaptonuria, and consumption of food such as blackberries, beetroots, carrots, fava beans, and oral aloe therapy. (6)

Although adequate data is available on purple urinary bag syndrome (PUBS), there is insufficient literature on similar purple discoloration occurring in a chest tube drain. Only one such case was reported by Saurabh Mehrotra et al (7) in recent times. We believe the purple discoloration in this case is multifactorial with similar biochemical mechanism as seen in PUBS, including bacterial infection which in this case Klebsiella pneumoniae was the isolated organism. Probable tube contamination due to mild dislodgement could be a possible route of entry of the pathogen. Presence of Indoxyl sulphate in serum is a likelihood that needs further study. The benign nature of the tube discoloration was explained to the patient and subsequently managed with sensitivity guided antibiotic therapy. This alarming visual finding is of importance to clinicians and its awareness would further advance for a better management of the patient and their concerns in similar clinical scenario.



**Figure 1: Purple discoloration of the chest tube drain**



**Figure 2: Sample collected from tube for culture**

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