

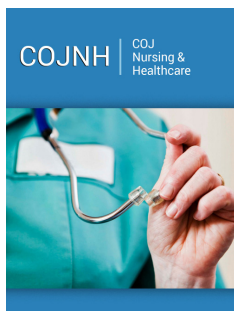
## Green Urine after Laparoscopic Detection of Tubal Patency by Methylene Blue

Usama M Fouda<sup>1\*</sup>, Ragai M Fouda<sup>2</sup> and Khaled A Elsetohy<sup>3</sup>

<sup>1,3</sup>Professor of Obstetrics and Gynecology, Faculty of medicine, Cairo University, Egypt

<sup>2</sup>Assistant Professor of Internal Medicine, Cairo University, Egypt

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**\*Corresponding author:** Usama M Fouda, Professor of Obstetrics and Gynecology, Faculty of Medicine, Cairo University, Cairo, Egypt

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### Abstract

Green urine is a rare clinical finding which causes marked anxiety of the patients and the clinicians. Possible causes of green urine include Vesicoenteric or Vesicouterine fistulae, Biliverdin (Oxidized Bilirubin), pseudomonas infection of Urinary Tract, Methylene Blue, Indigo Carmine, Evans blue, Drugs, Ingestion of certain types of blue food, Chlorophyll-Containing Breath Mints (Clorets) and Inorganic Herbicides. In this report, we report a 27 year Egyptian infertile patient with bilateral Hydrosalpinges who presented with greenish discoloration of urine few hours after laparoscopic fenestration of fallopian tubes. The urine returned to its normal color after two days. Careful history taking of drug intake, examination and investigations suggested that methylene blue, used in chromopertubation, was the cause of greenish discoloration of urine. This rare benign side effect of methylene blue should be known by the gynecologists in order to avoid unnecessary invasive investigations and distress of patients and clinicians.

**Keywords:** Methylene blue; Green urine; Hydrosalpinx; Laparoscopy

### Introduction

Green urine is a rare clinical finding which causes marked anxiety of the patients and the clinicians. Possible causes of green urine include Vesicoenteric or Vesicouterine fistulae, Biliverdin (Oxidized Bilirubin), pseudomonas infection of urinary tract, Methylene blue, Indigo carmine, Evans blue, Drugs, Ingestion of certain types of blue food, chlorophyll-containing breath mints (Clorets) and inorganic herbicides (Table 1) [1-12]. In this report, we present a case with greenish discoloration of urine after laparoscopic detection of tubal patency by methylene blue.

**Table 1.**

Causes of Greenish discoloration of urine
<b>Drugs</b>
Amitriptyline [2], Cloquinoxol [3], Cimetidine, Flupirtine, Metoclopramide [4], Methocarbamol, Metronidazole [5], Magnesium Salicylate, Indomethacin, Iodochlorhydroxyquin, Mitoxantrone [6], Promethazine, Phenyl salicylate, Propofol [7], Zaleplon [8]
<b>Chemicals</b>
Blue food dye [9], Clorets (chlorophyll-containing breath freshener) [10], Inorganic herbicides [11], Phenol [12]
<b>Dyes</b>
Methylene blue [13], Indigo carmine, Evan Blue, Diagnex blue [14]
Pseudomonas infection [1]
Vesicoenteric fistula [1]
Biliverdin [1]

### Case Report

A 27 years old Egyptian patient with primary infertility for 9 years was admitted to Cairo university hospital. Hysterosalpingography and ultrasonography revealed the presence of bilateral hydrosalpinges. Laparoscopic salpingectomy was planned to improve the outcomes of *in vitro* fertilization embryo transfer (IVF-ET).

The identification of both fallopian tubes during laparoscopy operations was difficult due to the presence of extensive adhesions. Repeated insufflations with methylene blue was done

to identify fallopian tubes and to detect their patency. Fenestration of the distended blocked tubes was performed to increase the success of subsequent IVF-ET. Few hours after the operation the color of the urine became green. The urine returned gradually to its normal color after two days. The patient was discharged four days after the operation. The urine analysis revealed absence of pus cells and bilirubin in urine. The urine culture was negative.

There was no history of intake of drugs or chemicals which cause greenish discoloration of urine. There was no history of intake of foods which cause greenish discoloration of urine and the color of stools was normal. We thought also that the possible causes of green urine were the occurrence of vesicouterine fistula resulting in leakage of methylene blue into the urine or the occurrence of vesicoenteric fistula resulting in leakage of bile salts in urine. There were no signs suggestive of vesicointestinal or vesicouterine fistula or urinary tract infection. Computed tomography with oral contrast revealed no vesicoenteric or vesicouterine fistulae. We concluded that the most probable cause of green urine was methylene blue used in chromopertubation.

## Discussion

Methylene blue is used in the treatment of malaria, resistant plaque, cyanide poisoning, methemoglobinemia, Carbon monoxide poisoning, septic shock and Ifosfamide neurotoxicity. Methylene blue is rapidly excreted by the kidney after oral or intravenous administration as leucomethylene blue which, like methylene blue, is blue green in color [13]. In surgery, methylene blue is used to detect whether a fistula exist between GIT and skin and in sentinel lymph node sampling. In Gynecology, methylene blue is used to detect tubal patency in cases with infertility [14,15].

Although greenish discoloration of urine is a well-known side effect of oral and intravenous administration of methylene blue [13]. Few case reports revealed that local (non-systemic) use of methylene blue was associated with greenish discoloration of urine. Cvetkovic et al reported a case with green urine due installation of methylene into the fistula channel during local treatment of hip osteomyelitis [16]. Tonseth et al reported a case with green urine after surgical treatment of pressure ulcer, they suggested that the methylene blue used during the revision of wounds was absorbed from the microcirculation of the wounds and subsequently excreted by the kidney [17].

In addition, several studies confirmed the possible occurrence of intravasation of contrast material used in hysterosalpingography [18], therefore we postulated that the cause of greenish discoloration of urine in our case was intravasation of methylene blue into the circulation. In conclusion, postoperative greenish discoloration of urine after laparoscopic detection of tubal patency with methylene blue may be caused by serious conditions as vesicointestinal and vesicouterine fistulae or may be caused by drugs or methylene blue. The greenish discoloration of urine caused by drugs or methylene

blue is usually reversible within few days after stopping offending agents with no adverse effect on patient. This rare benign side effect of methylene blue should be known by the gynecologists in order to avoid unnecessary invasive investigations and distress of patients and clinicians.

- A. Written informed consent was obtained from the patient for publication of this case report and accompanying images.
- B. There were no funding sources that supported this work

The author(s) declare that they have no competing interests”

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