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Blue Urine Following Diagnostic Hysterolaparoscopy: A Postoperative Dilemma

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Abstract

Tubal factors contribute to approximately 25%–35% of female infertility, with laparoscopic chromopertubation recognized as the gold standard for evaluating tubal patency. Methylene blue is commonly used during diagnostic hysterolaparoscopy to visualize tubal flow. Although generally safe, systemic absorption followed by urinary excretion may occasionally be mistaken for a postoperative complication. Here we review a case where methylene blue appeared in urine about five hours post-procedure, prompting concerns about dye absorption and emphasizing the need to understand its pharmacokinetics and normal excretory patterns.

***Keywords*:** Blue Urine, Diagnostic Hysterolaparoscopy, Chromopertubation.

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INTRODUCTION

Tubal factor accounts for 25%-35% causes of female infertility and laparoscopic chromopertubation remains a gold standard to assess tubal patency [1]. Methylene blue serves as valuable agent to visualise tubal patency during chromopertubation in diagnostic hysterolaparoscopic procedures [1]. While generally considered safe when used appropriately, the systemic absorption and subsequent urinary elimination of methylene blue can occasionally present diagnostic challenges that may initially mimic procedural complications [2]. The present discussion examines a clinical scenario where methylene blue dye excretion in urine about 5 hours after diagnostic hysterolaparoscopy raised concerns about the systemic absorption of methylene blue dye and its complications, highlighting the importance of understanding the pharmacokinetic properties and normal elimination pathways of this agent.

CASE PRESENTATION

A 30-year female with primary infertility of three years,regular menstrual cycles and body mass index (BMI) of 20 underwent diagnostic Hysterolaparoscopy with chromopertubation in view of Hysterosalpingography (HSG) image of left cornual block and free peritoneal spill on right side.

Figure 01: HSG image

Hysteroscopy showed presence of normal uterine cavity with both ostia visualised in the same panoramic view.Grade I endometriosis was observed on laparoscopy. Transcervical chromopertubationshowed free peritoneal spill on the right side and delayed spill on the left side after 20-30 ml of 1% methylene blue dye was pushed.

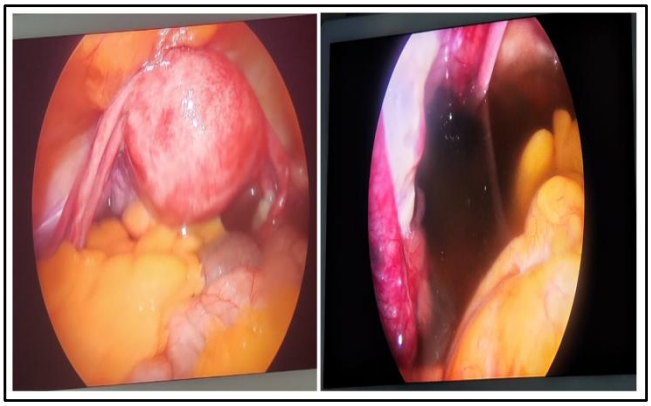

Figure 02: Per-operative Laparoscopy Images

In the immediate postoperative period i.e. after 4-5 hours, the patient developed blue coloured urine which resolved on its own within 24 hours.

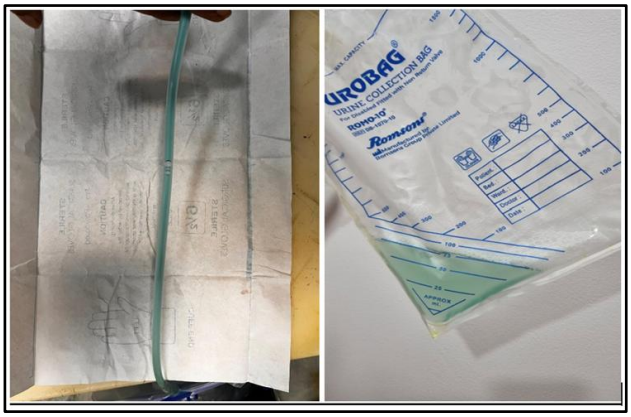

Figure 03: Greenish-Blue coloured Urine

The absence of other clinical signs of perforation, such as abdominal pain, distension, or hemodynamic instability, coupled with the benign course of the blue discoloration, supported the diagnosis of physiological dye excretion rather than a procedural complication.

PHARMACOKINETICS

Methylene blue acts by reducing the oxidised form of Haemoglobin Fe3+ in methemoglobinemia to Fe+2 which in turn increases the oxygen carrying capacity of Haemoglobin. It can undergo uptake in two ways [3]. It may be directly through the endometrial uterine vasculature or through transperitoneal uptake once it enters the peritoneal cavity via the fallopian tubes. It then undergoes renal metabolism wherein it combines with the urobilinogen pigment and imparts a greenish blue hue to the urine when it is excreted out [4].

DISCUSSION

Methylene blue is used in treatment of drug induced methemoglobinemia at doses of 1-2 mg/kg which is usually given as 0.1- 0.2 ml/kg of a 1% (10mg/ml) solution intravenously over 5-10 minutes. However at doses more than 4 mg/kg it may cause blue green discolouration of urine. At doses more than 7 mg/kg it results in nausea, vomiting, haemolysis and fever.

Further toxicity i.e. at doses more than 20 mg/kg result in hypotension whereas bluish discolouration of skin appears at doses more than 80 mg/kg which may be treated by a dilute solution of hypochlorite [5]. Methylene blue in the blood stream at higher concentrationsresults in methemoglobinemia due to haemoglobin oxidation which is particularly more common in patients with genital tuberculosis or pelvic inflammatory diseases [6].

CONCLUSION

Knowledge about the adverse events occurring from the non-systemic administration of methylene blue dye is important as it plays a role in better vigilance on the part of the surgeons and the anaesthetists so as to avoid any life threatening complications. The phenomenon of methylene blue appearing in urine post-hysteroscopy represents a physiological process rather than a pathological complication. Understanding this mechanism is crucial for clinicians in detecting dose related toxicity of methylene blue and its subsequent management.

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ETHICAL STATEMENT

Written informed consent was received from the patient for publishing the study.

CONFLICT OF INTEREST

Conflict of interest declared none.

AUTHOR CONTRIBUTION STATEMENT

	Sumbul Reema (Author 1st)	Richa Sharma (Author 2nd)
Concepts	✓	✓
Data acquisition	Not Applicable	Not Applicable
Data analysis	Not Applicable	Not Applicable
Definition of intellectual content	✓	✓
Design	✓	✓
Guarantor	✓	
Literature search	✓	✓
Manuscript editing	✓	✓

Manuscript preparation	✓	
Manuscript review	✓	✓
Statistical analysis	Not Applicable	Not Applicable

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