

A Rare Case of Delayed Pulmonary Oedema due to Methemoglobinemia Following Laparoscopic Chromopertubation with Methyleneblue

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ABSTRACT

The patient is a young infertile lady with right tubal block on hysterosalpingogram was subjected for diagnostic hysterolaparoscopy. Hysterolaparoscopy findings were normal. Transcervical chromopertubation was performed using 20 -30 ml of diluted methylene blue through hysterosalpingogram cannula. Hesitant flow of dye was noted on left side after 2-3 flushing attempts. Ampullary block noted on right side with no spillage of the dye. Patient made an uneventful anaesthetic recovery. Five hours later patient developed tachypnea, hypotension and bluish colored urine was drained. She was shifted to ICU and patient eventually recovered after hemodynamic support with oxygen, steroids and inotropes. Spectrophotometric analysis showed methemoglobin levels of 26.3%. This case is reported for its rare but potentially fatal complication of pulmonary oedema following methylene blue. In this case pulmonary oedema manifested late in the postoperative period compared to other reported cases in the literature where pulmonary oedema was seen during intraoperative period.

Keywords: Diagnostic laparoscopy, Tubal patency tests

CASE REPORT

The patient is a 25-year-old infertile lady presented to our hospital with primary infertility for 10-years. Her general physical and systemic examinations were within normal limits. Hysterosalpingogram (HSG) showed right fimbrial block [Table/Fig-1]. Ultrasound examination of the abdomen and pelvis was normal and follicular study was suggestive of ovulation.

She underwent diagnostic hysterolaparoscopy under general anaesthesia on December 7, 2013. Hysteroscopy showed normal uterine cavity, both the ostia were visualized and looked normal. Uterus, tubes and ovaries appeared normal, POD was clear. Transcervical chromopertubation was done using 20-30 ml of diluted 1% methylene blue dye through HSG cannula. Hesitant flow of dye was noted on left side after 2-3 flushing attempts and ampullary block noted on right side with no spillage of dye. Patient made an uneventful anaesthetic recovery at 11:00 hrs.

Five hours later, around 16:00 hrs patient complained of giddiness while voiding urine. On examination she was tachypnoeic, pulse was feeble with SBP of 70mm Hg. Peripheral oxygen saturation SpO₂ - 85%. Bilateral basal fine crepitations auscultated with

falling O₂ saturation. On catheterization, bluish colored urine was drained which cleared after few hours. Patient was given 100mg hydrocortisone and oxygen. Patient was shifted to ICU for cardiorespiratory support. Her chest X-ray showed features of pulmonary oedema. Patient was given inotropes, furosemide and oxygen inhalation. Oxygen saturation improved gradually and she was hemodynamically stable after 48 hours. Spectrophotometric analysis revealed methemoglobin level of 26.4%. PCR TB for endometrium was negative; HPR was negative for tubercular endometritis. G6 PD testing could not be done in our set up. Patient was shifted back to the ward from the ICU on December 10, 2013. She was discharged from the hospital on 7th postoperative day on December 14, 2013 and doing well since then.

DISCUSSION

Evaluation of tubal factor infertility is moving from mere anatomical assessment to morphological and functional enquiry of the patency of the tubes [1]. A first line laparoscopy is being increasingly used in the comprehensive evaluation of infertility. Laparoscopic chromopertubation with methylene blue is the gold standard for morphological and functional assessment of the tubes.

Traditionally methylene blue is widely used in various clinical conditions like detection of fistulae, tube patency tests and sentinel node biopsy in various malignancies and is considered as the safest among blue dyes. This is most likely due to rarity of the literature reporting anaphylaxis and anaphylactoid reactions to methylene blue.

Life-threatening anaphylactic or anaphylactoid reactions to methylene blue have been reported in the literature [2, 3].

Methylene blue can extravasate into lymphatics particularly in chronic Pelvic inflammatory disease (PID) and genital Tuberculosis (TB) cases and manifest as methemoglobinemia [4]. Normally, methemoglobin levels are <1%, as measured by the co-oximetry test [5]. Cyanosis is the classic symptom of methemoglobinemia (methemoglobin >1%), other signs and symptoms include shortness of breath, mental status changes (~50%), headache, fatigue, exercise intolerance, dizziness and loss of consciousness.



[Table/Fig-1]: HSG showing right fimbrial block

Severe methemoglobinemia (methemoglobin > 50%) patients have dysrhythmias, seizures, coma and death (> 70%) [6]. Healthy people may not have many symptoms with methemoglobin levels < 15%. However, patients with co-morbidities such as anaemia, cardiovascular disease, lung disease, sepsis and in individuals with G6PD deficiency, methylene blue can induce methemoglobinemia even at normal levels [7].

Nolan reported a case of inflammatory peritonitis with ascites after methylene blue dye chromopertubation during diagnostic laparoscopy [8]. Trikha et al., reported a case of pulmonary oedema following intrauterine methylene blue injection [6]. Millo et al., reported fatal pulmonary oedema following laparoscopic chromopertubation [9]. Mhaskar reported methemoglobinemia following chromopertubation in a treated pelvic tuberculosis case [10]. Few clinical cases with presumptive diagnosis in the absence of allergological assessment have been reported. Dewatcher et al., proved methylene blue as the cause of reaction by a cutaneous test [11]. In all these cases, anaphylactic and anaphylactoid reactions have occurred during intraoperative period or in the immediate postoperative period. In our case hypersensitivity reaction and methemoglobinemia occurred five hours after the conclusion of surgery. Salient features of reactions following methylene blue in various case reports are highlighted in [Table/Fig-2].

Authors	Pulmonary oedema	Evidence of TB	Post-operative status	Methemoglobin levels
Our case	Postoperative 5 hours later	No	recovered	26.4%
Mhaskar et al., [10]	Intraoperative	Yes	recovered	9.4%
Asha Rathi et al., [3]	Intraoperative	Yes	recovered	8.9%
T Millo et al., [9]	Postoperative-15 mins later	No	Died	NA
Trikha et al., [6]	Intraoperative	No	recovered	NA

[Table/Fig-2]: Comparison of reactions following Methylene Blue use

High index of suspicion, awareness about hypersensitivity reactions, vigilance during intraoperative period, aggressive cardiorespiratory support with use of steroids will help in avoiding morbidity and mortality.

With the unique exposure risks in the perioperative period, it is the surgeon's responsibility to aid in the proper immediate and short-term treatment of anaphylaxis and anaphylactoid-like reactions [12].

In our case pulmonary oedema could have occurred due to a delayed anaphylactoid reaction and methemoglobinemia due

to systemic absorption of methylene blue. Whenever methylene blue is used for chromopertubation the possibility of potential dangerous complications should be borne in mind. Alternatively diluted povidone iodine can be used for chromopertubation.

CONCLUSION

It is important to publish reports on adverse events from a technique which is commonly used in clinical practice. This rare case highlights the fact that methylene blue has the potential of causing life-threatening complications even after a non-systemic administration and late in the postoperative period. This confirms the need for continued vigilance during the postoperative period. Anesthesiologists and surgeons should be aware of the possibility of hypersensitivity reactions involving any drug or substance used during perioperative period.

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