

Dyed But Not Dead: Methemoglobinemia Following Chromopertubation with Methylene Blue

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Abstract

A patient undergoing chromoperturbation with methylene blue developed methemoglobinemia. Methylene blue dye used for chromotubation during laparoscopic evaluation can extravasate in lymphatics particularly in cases of Chronic PID, Tuberculosis. Methemoglobinemia as a complication occurs whenever high concentration of dye is used. Other complications are anaphylactic reaction, pulmonary edema. Conservative management with aggressive support for hemodynamic stability is the rule.

Keywords: Methylene blue dye, chromotubation, laparoscopy, methemoglobinemia.

INTRODUCTION

Among various tests used to evaluate tubal patency, laparoscopic chromoperturbation using methylene blue is useful as it indicates patency as well as making laparoscopic assessment possible. The dye is introduced through the cervix using a cannula or catheter. A few potentially dangerous complications like peritonitis, pulmonary edema¹ anaphylactic reactions² and methemoglobinemia have been reported with this technique, but very rarely.

CASE REPORT

A 23-year-old lady presented to our hospital with primary infertility for 4 years. She was a known and treated case of cervical tuberculosis diagnosed 3 years back, for which she had completed the course of antitubercular drugs 10 months prior to her presentation to this hospital. Her recent endometrial biopsy revealed a secretory endometrium with no evidence of tuberculosis on histopathological examination. Her ESR was normal (12 mm in first hour). Her HSG showed corneal block on the right side and fimbrial block on the left.

The patient was taken up for diagnostic laparoscopy and chromoperturbation under general anesthesia. Twenty ml of methylene blue in a concentration of 20 mg in 100 ml was injected transcervically using a Foley's no. 8 catheter. On laparoscopy,

the uterus was seen to be covered by flimsy adhesions. Both the fallopian tubes showed a beaded appearance and the right tube had a cornual block. The left tube had been converted into a hydrosalpinx due to a fimbrial block. These findings were suggestive of pelvic tuberculosis. An unusual finding was that of the uterus being deeply blue stained during the procedure and the extravasation of dye into the broad ligaments.

Half an hour into the procedure, a bluish discoloration of the skin, mucous membranes and nails was noted. An examination performed at the time revealed a pulse rate of 112/min, a blood pressure of 126/76 mm Hg, a respiratory rate of 35/min, bilaterally clear lung fields and central cyanosis. Pulse oximetry revealed that her oxygen saturation had dropped to 62% from an initial range of 97 to 98%. On catheterization, the patient was found to have blue colored urine (Fig. 1). She was administered 100 mg of hydrocortisone in addition to symptomatic treatment. Spectrophotometric analysis revealed a methemoglobin level of 8.9%, thus confirming the diagnosis of methemoglobinemia. Oxygen saturation improved gradually and the patient was extubated 2 hours after the procedure was completed.

G-6PD testing could not be done due to its unavailability in our set-up. Bluish discoloration of her urine cleared over the next 7 days. The patient was discharged on the 7th postoperative day and has been doing well ever since.



Fig. 1: Photograph (with permission) taken after the procedure showing bluish discoloration of the face, hands, skin and urine

DISCUSSION

Methemoglobinemia is a condition where ferrous ion of hemoglobin gets oxidised to ferric ion due to the action of various substances like aniline dyes, etc. Methylene blue and ascorbic acid are used to treat the condition. Paradoxically, methylene blue itself can cause methemoglobinemia in high concentration. This dye is used very commonly for chromoperturbation and side-effects are rare. However, pulmonary edema, methemoglobinemia and anaphylaxis may rarely occur.

Our patient was dyed, but fortunately not dead. Methemoglobinemia may be produced in susceptible individuals like those with G-6PD deficiency,³ or pelvic tuberculosis.⁴ The dye can extravasate in cases of chronic PID, pelvic tuberculosis⁴ or injection of the dye under pressure in presence of blocked tubes.

In this case, the dye entered the broad ligament lymphatics and finally the systemic circulation, leading to methemoglobinemia. As this patient was having laparoscopic features suggestive of tuberculosis, it is likely that the extravasation occurred due to extensive pelvic tuberculosis. Tuberculosis, as a cause of infertility, is common in this part of the world due to a high prevalence of the disease. The possible complication of methemoglobinemia should be borne in mind whenever chromopertubating a patient of infertility.

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