

Methylene blue anaphylaxis under anaesthesia, during sentinel lymph node mapping in a patient undergoing bilateral mastectomy

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Methylene blue is a widely used dye for sentinel lymph node mapping for solid tumours especially breast cancer. Anaphylaxis is a life threatening

reaction that can occur during Anaesthesia. Methylene blue has been reported to be the safest dye, indeed a recent systematic review and meta-analysis reported no cases of anaphylactic reactions. We report a case of a 37-yr-old female who experienced an anaphylactic reaction to methylene blue resulting in Intensive Care Admission.

Key Words: Anaphylaxis; Methylene Blue; Intra operative; Anaesthesia

INTRODUCTION

Methylene blue is a dye used for sentinel lymph node mapping for numerous solid tumor's particularly breast cancer [1]. Several blue dyes are available however methylene blue is commonly used as it is widely available, cost effective and has lower reported rates of anaphylaxis [1-3]. Anaphylaxis is a potentially life threatening reaction that can occur during Anaesthesia [4]. This is 1 of 4 published case reports of life threatening anaphylaxis in adults to methylene blue dye during sentinel lymph node mapping.

CASE REPORT

We report a case of a 37-yr-old female who was planned to undergo an elective bilateral mastectomy for breast cancer. She had no other medical history; she had no known allergies and had undergone previous general anaesthetics with no complications.

For anaesthetic induction she was given midazolam, fentanyl, propofol and rocuronium and was a grade 2 airways, size 7 mm endotracheal tube (ETT) with no intubation complications. 30 min after induction methylene blue dye was injected into the left breast for sentinel lymph node identification. After injection the patient developed cutaneous nodules and blue fluid filled blisters around her left breast and left arm which spread down her torso and lower limbs (Figure1).

After 5 min of the rash presenting the patient then became hypotensive to a systolic blood pressure of 60 mmHg.

She was treated with 50 µg of adrenaline intravenously (IV) and 16 mg of dexamethasone IV followed by an adrenaline infusion at 14 µg/min. The ETT was exchanged for a size 7.5 mm and some airway swelling of the vocal cords was noted.

The decision was made to abandon surgery and the patient was transferred intubated to the Intensive Care Unit (ICU). The adrenaline infusion peaked at 14 µg/min and was weaned off over 6 h in ICU and she was treated with regular hydrocortisone IV and loratadine. The patient was successfully extubated and discharged from ICU 24 h later. Serial Trypsase levels were negative. The patient was rebooked for surgery without sentinel node biopsy.

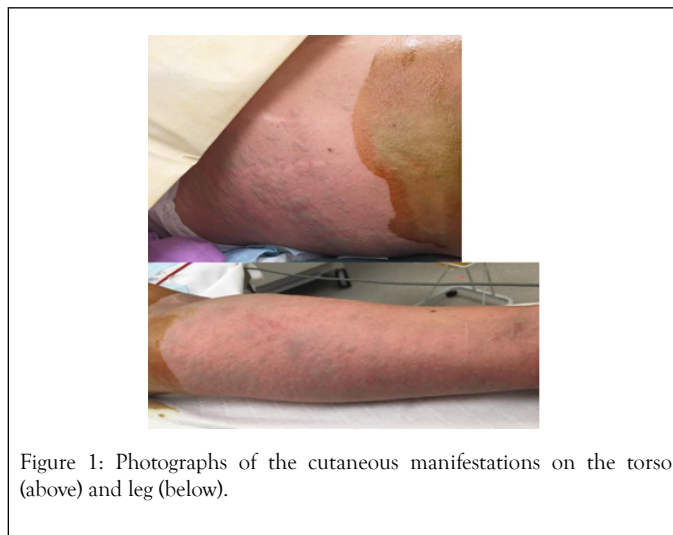


Figure 1: Photographs of the cutaneous manifestations on the torso (above) and leg (below).

DISCUSSION

Sentinel node mapping is important for staging of certain cancers, including breast cancer [1]. Blue dyes used for mapping include methylene blue, isosulfane and Patent Blue V [5]. Generally, methylene blue is considered to be the safest blue dye. A recent systematic review and meta-analysis reported no cases of anaphylactic reactions [1] and to date there have only been 3 reported cases of life threatening anaphylactic reactions to methylene blue during sentinel node mapping in adults. As such, it is important to be able to rapidly recognise and manage this potentially life threatening and rare complication. Teknos et al. [6] published a case in 2008 of pulmonary oedema post subcutaneous injection of methylene blue for sentinel lymph node biopsy. In this case, the patient developed tachycardia, hypertension and frothy secretions 5 min after subcutaneous injection of methylene blue. In 2010 Jangjoo et al. [7] and Oomah et al. [8] reported cases of anaphylaxis to methylene blue intraoperatively during sentinel lymph node biopsy for breast cancer. The patient reported by Jangjoo et al. developed hypotension, tachycardia, bronchospasm and hypoxia while in the case of Oomah et al. the patient developed hypotension, discolorations and angioedema.

Our case is unique in that a distinctive cutaneous rash occurred prior to the profound hypotension which has not been reported previously in the

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literature. This is significant as early recognition of this rash could potentially act as an early warning sign for impending anaphylaxis.

Furthermore, in this case serum tryptase levels were negative, though the diagnostic clinical criteria for anaphylaxis is still met based on the acute onset of clinical features, the involvement of the skin and reduced blood pressure [9]. Additionally, the sensitivity of serum tryptase is variable and modest therefore people without elevated tryptase levels can still have had an anaphylactic reaction to a drug and further investigation and follow up is recommended [10].

Anaphylaxis to methylene blue dye during sentinel lymph node biopsy is exceptionally rare. It is therefore important for surgical teams and anaesthetists to be aware of the potential for anaphylaxis to methylene blue to ensure early recognition and treatment of this potentially life threatening reaction. Our case contributes to the literature, and describes a unique presentation of methylene blue anaphylaxis.

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