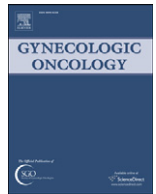




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Case Report

Anaphylactic shock during the sentinel lymph node procedure for cervical cancer

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ABSTRACT

Background. Patent blue is a commonly used agent in the detection of sentinel nodes (SN) in solid cancer. Similar to any drug, it is possible to have an allergic reaction during surgery. Anaphylactic reactions to patent blue have been rarely reported especially in cervical cancer.

Case. We reported here a rare case of anaphylactic shock due to patent blue in response to injection of patent blue for SN mapping in a woman with cervical cancer. We presented our management of the shock, our diagnostic process of the allergen and the treatment of the cervix cancer after the anaphylactic reaction.

Conclusion. Surgeons and anesthetists must be aware of the potential allergic of patent blue during the SN procedure.

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Introduction

The sentinel node (SN) concept has emerged as an alternative to systematic lymphadenectomy, reducing morbidity without compromising cancer staging. The feasibility and accuracy of the SN procedure have been demonstrated in various malignancies [1–4].

Cases of anaphylactic shock have occurred during the SN procedure with blue dye in patients with melanoma and breast cancer [5–12]. Few data are available anaphylactic shock using blue dye during laparoscopic SN procedure for cervical cancer. We described a case of anaphylactic shock complicating a first laparoscopic para-aortic and pelvic lymphadenectomy procedure in a woman with stage IIa cervical carcinoma.

Case report

A 34-year-old woman, para 2 with no significant medical history, was referred to the gynecology oncology department of our institution for treatment of a 47-mm-diameter cervical carcinoma involving the posterior vaginal fornix. Physical examination and magnetic resonance imaging classified the patient in stage IIa of the FIGO classification. In keeping with our institutional protocol [13], a first laparoscopic para-aortic and pelvic lymphadenectomy procedure was performed before concomitant radio-chemotherapy.

In brief, the SN procedure involved four pericervical injections, 1.5 cm deep, of 0.2 ml (20 MBq each) of unfiltered technetium sulfur colloid with a 25-gauge spinal needle on the day before surgery.

Under general anesthesia induced by midazolam (1.5 mg), sufentanil (20 µg), propofol (180 mg) and atracurium (30 mg), patent blue was injected pericervically with a 25-gauge spinal needle at 3 and 9 o'clock (1 ml per injection). Cardiovascular collapse occurred 25 min after anesthesia induction, 10 min after patent blue injection, and 5 min after the beginning of the laparoscopic procedure. The patient became hypotensive (50/20 mm Hg), with tachycardia (pulse 100 bpm), oxyhemoglobin desaturation (78%), and a fall in expired CO₂ from 35 mm Hg to 12 mm Hg. Initially, the oxymetric disorder was attributed to patent blue injection. There was no bronchospasm. The surgery was stopped. Symptomatic treatment based on oxygen therapy, epinephrine and IV colloid infusion was started. Fifteen minutes later her blood pressure returned to 100/60 mm Hg, after infusing 3000 ml of Ringer's lactate, 1000 ml of modified gelatin fluid and four epinephrine boluses (3 × 0.5 mg and 1 × 0.1 mg). Two hours later she developed generalized cutaneous edema and a bluish skin color. Except for the tryptase serum level (129 µg/l; normal < 13.5 µg/l), all blood tests were normal (hemogram, troponin, creatinine kinase, arterial blood gases, electrolytes and creatinine). Anaphylactic shock due to patent blue was suspected on the basis of on the chronology, the patient's history (three uneventful general anesthetics and no history of atopy) and clinical and biological findings.

Five days after surgery, allergologic tests were performed with the drugs used for anesthesia and for the SN procedure. Skin tests against midazolam, sufentanil, atracurium, and propofol were negative. No latex allergy was noted. In contrast, the patent blue prick test was positive, confirming allergy to this product.

Two weeks after the event she underwent concomitant neoadjuvant radio-chemotherapy, followed four weeks later by laparoscopic hysterectomy with bilateral pelvic lymphadenectomy. No allergic reactions or post-operative complications occurred. Final histology revealed a residual lesion of 5 mm on the posterior lip of the cervix,

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without lymph node involvement. She is alive and disease-free with one year of follow-up.

Discussion

Patent blue belongs to the triphenylmethane dye family. It is widely used to color textiles, paints, cosmetics, foodstuffs (E131) and medicinal products such as laxatives. Patent blue and its derivative isosulfan blue are the blue dyes most commonly used for intraoperative lymphatic mapping [14].

Between 1 and 2.8% of patients are hypersensitive to patent blue [9–15]. Anaphylactic shock is rare during SLN procedures. As in the current report, most previous cases involved patients with no atopic predisposition. The allergic reaction to patent blue is only partly understood, and is thought to involve anaphylaxis. One hypothesis is that, after initial contact with the patent blue antigen, B lymphocytes produce specific IgE antibodies; secondary contact triggers immediate release of histamine and tryptase by basophils and mast cells. However, specific IgE to patent blue has not been identified by radioallergosorbent assay [12]. Activation of an alternative complement pathway, without antibody-antigen interaction, has also been suggested [16]. In both theories, shock follows histamine release by mast cells, as confirmed by elevated serum levels of histamine or tryptase, or increased urinary methyl histamine levels. Our patient had a high serum tryptase level, confirming the allergic mechanism. As in the case we describe, most anaphylactic reactions to patent blue are diagnosed within 2 h after injection. The symptoms are polymorphous, and may include minor reactions such as urticaria, pruritus, erythema, generalized rash and blue hives, while severe reactions such as pulmonary edema, bronchospasm and shock are rare [5,9]. No deaths have been reported.

Three other cases of anaphylactic shock during SLN procedures for cervical cancer have been reported, but with few details [17–19]. Despite the low incidence of this complication, patients must be informed of the risk and prick testing before surgery may be warranted. However, shock has also been reported after patent blue injection in patients with negative prick tests [15]. Administration of hydrocortisone, diphenhydramine and famotidine at the induction of anesthesia or just before blue dye injection has been proposed as a preventive measure [20]. Methylene blue, a product with no known allergic reactions, could be an alternative to patent blue for patients with breast cancer undergoing the SN procedure [10,21], but has not been tried in women with cervical cancer.

The occurrence of anaphylactic shock modified the treatment of our patient but did not diminish its efficacy. Indeed, concomitant neoadjuvant radio-chemotherapy is a suitable alternative to first-line surgery for women with locally advanced cervical cancer [22].

In conclusion, surgeons and anesthetists must be aware of the potential allergic complications associated with the use of patent blue

in SLN procedures. The place of routine hydrocortisone prophylaxis at the induction of anesthesia remains to be determined. Women must also be informed of the potential adverse effects of patent blue. Screening for allergy to patent blue may be warranted for women with a history of atopy.

Conflict of interest statement

Authors have not declared conflicts of interest.

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