ELSEVIER

Surgical Oncology 14 (2005) 151–154

Surgical Oncology

www.elsevier.com/locate/suronc

# Patients blue on patent blue: An adverse reaction during four sentinel node procedures

E. Beenen, D.B.W. de Roy van Zuidewijn*

*Medisch Centrum Leeuwarden, Henri Dunantweg 2, 8934 AD Leeuwarden, The Netherlands*

**Abstract**

Patent blue V is a well-known dye for visualisation of the lymph nodes in a sentinel lymph node biopsy in breast carcinoma. We present four cases of an adverse reaction to patent blue V, one of which was an anaphylactic shock.

The adverse reactions to patent blue and isosulphan blue as found in the literature are discussed and an alternative is suggested.


*Keywords:* Urticaria; Anaphylactic shock; Breast carcinoma; Patent blue V; Isosulphan blue; Sentinel node

## 1. Introduction

Since the 'discovery' of the sentinel node concept, its biopsy has become a routine procedure in the treatment of breast carcinoma. As in most hospitals to detect the sentinel node, the day or morning before surgery we perform a lymphoscintigram. Additionally, in the operating theatre the patient receives an injection of patent blue V in the affected breast directly after induction of anaesthesia. Guided by a gamma probe and the blue coloured lymph vessels and nodes, a sentinel lymph node biopsy (SLNB) can be performed. The use of patent blue V can have a down side: we would like to present four adverse reactions on patent blue V as were witnessed in our patients.

## 2. Patients and methods

From 1 January 2002 until 31 December 2004, 371 sentinel lymph node biopsies were performed. The SLNB was performed in all patients who had a proven malignancy of the breast in which the tumour was smaller than 5 cm (<T3). The diagnosis of breast cancer was considered proven either by a positive triad (high suspicion for malignancy at physical examination, radiological evaluation and cytology) or histological biopsy. Lymfadenopathy had to be excluded (physical examination and ultrasonography). Previous operations on the affected breast were also a contra-indication because of the suspected altered lymph drainage.

The day or morning before operation SLNB patients underwent a lymphoscintigraphy, using 99 Tc-colloid, to determine the number and position of the sentinel nodes. Subsequently the patients were taken to the operating theatre and anaesthesia was given. Before covering the patients up with sterile drapes, 2 $cm^3$ of patent blue V 2.5% (calcium alpha-(4-diethylaminophenyl)-alpha-(4-diethyliminiocyclohexa-2,5-dienylidene)-5-hydroxyto-luene-2,4-disulphonate; Laboratoire Guerbet, France) was injected subcutaneously over the tumour or subareolarly in the quadrant of the tumour. The operating field would be disinfected and covered up and a sentinel lymph node biopsy was performed. All lymph nodes either being blue or radioactive were considered a sentinel node.

## 3. Results

In the 371 patients in whom a sentinel node lymph biopsy was performed, four adverse reactions were observed. Three patients had an allergic skin reaction and one patient suffered an anaphylactic shock.

*Corresponding author.

*E-mail address:* D.B.W.de.Roy.Van.Zuidewijn@ZNB.nl (D.B.W. de Roy van Zuidewijn).

0960-7404/$ - see front matter © 2006 Elsevier Ltd. All rights reserved.
doi:10.1016/j.suronc.2005.12.001

The first patient was a 60-year-old lady with a medical history of Graves disease for which she used prednison. She was treated for a carcinoma of the right breast in the upper-medial quadrant. The second patient was 71-year old and had a coronary bypass operation 2 years earlier. She was treated for a carcinoma of the left breast in the upper-medial quadrant. The third patient was 77-year of age and had a hysterectomy in the past. She was treated for a retro-areolar carcinoma of the right breast.

All three patients underwent the same procedure for sentinel lymph node biopsy as has been described. The breast and axilla were disinfected and the patients were covered with sterile drapes. First the SLNB was performed, followed by the lumpectomy. In all three cases the sentinel nodes could be found and had turned both blue and radioactive.

After removing the sterile drapes all three patients showed the same 'smurfish' blue urticaria spread over the entire body surface (Fig. 1). No haemodynamic instability during any part of the operation was monitored. In one patient an antihistaminicum (4 mg Tavegyl iv) and a steroid (100 mg hydrocortisone) were administered as prophylaxis after discovery of the blue papules. After detubation they were closely observed on the recovery ward. When none of the patients showed any sign of progression of the urticaria or any sign of haemodynamic instability, all three were dismissed to the nursing ward. During the day the urticaria resolved without any problems. All three patients were discharged from hospital the following day without any residual effect.

The fourth patient was an elderly lady aged 72. Her medical history consisted of hypertension, ovariectomy because of benign cysts and a nephrectomy because of a Grawitz tumour 12 years previously. She was being treated for a carcinoma of the upper-lateral quadrant of the left breast. The objective was to perform a SLNB followed by an ablation of the left breast. After injection of the patent blue V, while disinfecting the patient, a severe decline in the blood pressure was witnessed. An anaphylactic shock was concluded and ephedrine, tavegyl and prednison were administered. The patient recovered and a SLNB was performed. When the surgeon wanted to continue with the ablation a second period of hypotension occurred. It was successfully treated with epinephrine. The ablation was aborted. After removing the sterile drapes no urticaria were seen. The patient was monitored for a prolonged time in the recovery ward. She remained haemodynamically stable and no further adverse events occurred. After being taken to the nursing ward, she was discharged after several days without any residual effect. The mastectomy was performed at a later stage.

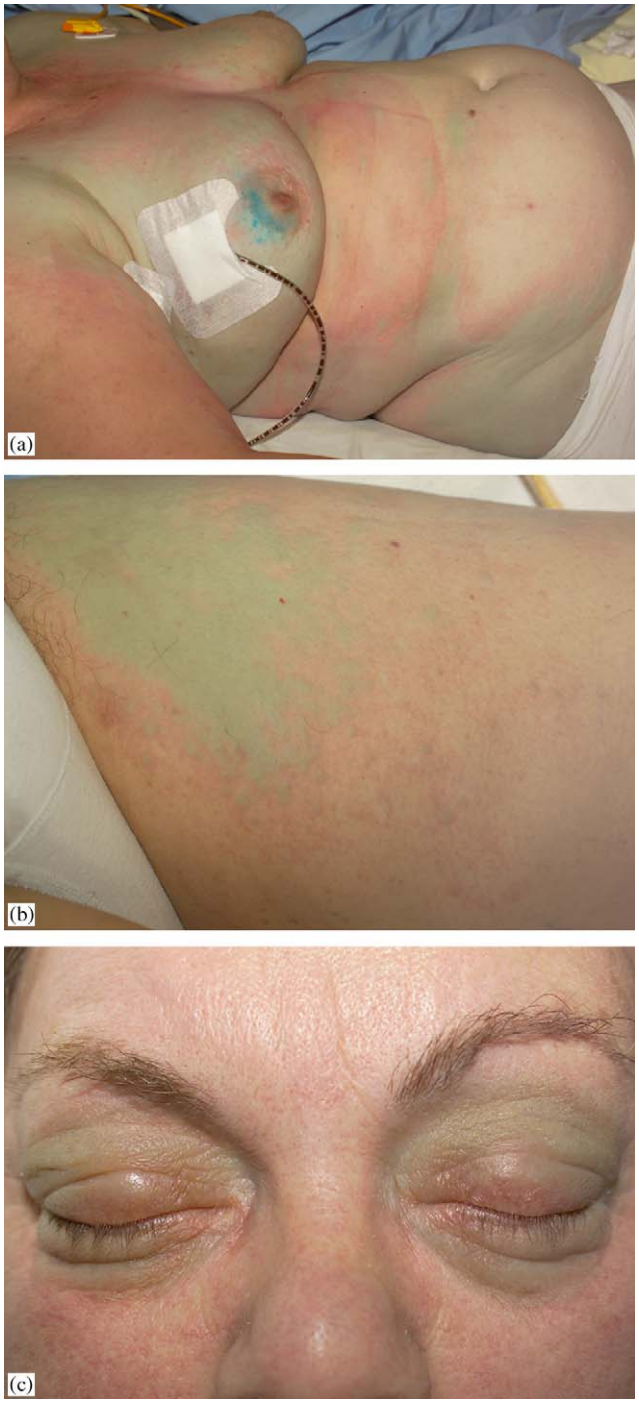


Fig. 1. The pictures show body parts with the 'smurfish' coloured urticaria. The urticaria were distributed all over the body. The same pattern occurred in all three patients. These pictures were chosen because of their optimal visualisation.

## 4. Discussion

Patent blue V is a well-known dye in the food industry. This may be the cause of sensibilisation since one patient admitted to having had urticaria before after eating artificially coloured candy.