

USE OF BLUE DYE FOR SLNB

Increasingly sentinel lymph node biopsy (SLNB) is the preferred method for staging the axilla in early breast cancer (NICE Guidelines 2009). In the UK the SLN is successfully localized in 99% of patients using a combined technique of radioactive (TcM99m) labelled nanocolloid and 2mls of diluted Patent V blue dye injected into the breast (NEW START Programme). SLNB using the dual localisation protocol is now being used for other tumours, notably melanoma, penile, testicular, cervical and head and neck cancers.

Patent V blue, a colorant used in textiles and food (E131), has also been used in lymphangiography since the 1960s. It is associated with allergic reactions ranging from mild urticarial rash (grade 1) to severe anaphylaxis requiring inotropic support (grade 3). No mortality has been reported. NEW START and ALMANAC, the largest UK SLNB datasets, recently demonstrated a 1% allergy rate in nearly 6000 procedures¹. The majority of these reactions were grade 1 but non-fatal cardio-respiratory arrest has been reported elsewhere².

There is no evidence that patients with a general history of allergy (including food colourants) are more likely to develop blue dye anaphylaxis. Anaphylaxis to blue dye is mediated through type I immediate hypersensitivity. Skin prick testing is used to identify immediate (type I) hypersensitivity and is useful in the investigation of anaphylaxis after it has occurred³. There is no evidence skin prick testing is beneficial as a pre surgery screening tool and there is evidence to the contrary:

- a. False positives (1/12 – healthy controls when skin tested with neat dye)³
- b. Skin prick testing can induce sensitization in 2.5% of individuals when skin tested with penicillin⁴

Therefore pre-surgery skin prick testing may:

- c. Unnecessarily exclude some patients from blue dye use
- d. Potentially cause sensitization in patients that were not sensitive at baseline, who could then go on to react when administered the dye intra-operatively

Skin patch testing is useful to assess delayed type IV hypersensitivity which is not part of the mechanism of anaphylaxis.

Other blue dyes used for SLNB are methylene blue, and isosulphan blue (an isomer of Patent V), popular in the USA. Isosulphan blue reaction rates are about 1.4%. Methylene blue, used less commonly because of concerns about lymphatic uptake and fat necrosis at the injection site seems to have less reactive potential but this may represent lower numbers combined with reporting bias.

In the UK we diagnose over 44,000 new breast cancers per annum of which 25-30,000 may be suitable for SLNB. A 1% reaction rate would equate to 250-300 adverse events per annum for breast procedures, and with the increasing use of SLNB for other tumour sites we are likely to see more reactions; every effort must be taken to minimise patient risk.

SUMMARY STATEMENT: USE OF BLUE DYE FOR SLNB

RECOMMENDATIONS:

- Patients must be informed of the use of blue dye and its allergic potential as part of the consent process, and the risk documented on the consent form
- Patients with a history of food dye allergy can be offered blue dye
- Skin prick testing with Patent V blue dye
 - should not be used as a pre-surgery screening tool
 - may be used to confirm the cause of anaphylaxis following SLNB
- Any reaction must be reported to the Committee of Safety in Medicines (Yellow card scheme).
- Patient with suspected blue dye anaphylaxis must be investigated in a specialist centre. A list of these centers can be found on the Association of Anaesthesia website <http://www.aagbi.org/safety/allergies-and-anaphylaxis>

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