Histopathological approach of sentinel lymph node biopsy examination

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Sentinel lymph node (SLN) examination has becoming one of the most advantageous and useful tools for more precise staging procedure of variety of solid malignancies, especially malignant melanoma, breast cancer and recently, thyroid cancer. With preoperative radioactive lymphoscintigraphic mapping, followed by intra- and postoperative histopathological examination of SLN, it is possible to significantly improve detection rate of regional lymph node metastases. Furthermore, using combined serial sectioning and immunohistochemistry, 65% of patients with malignant melanoma and 10%-15% of breast cancer patients that were initially node negative are generally found positive for SLN metastases. Concerning the possibility of understaging SLN positive patients, the following issues arise for all solid malignancies: frozen section examination should include 1-3 slices per node, depending on the size; paraffin-embedded samples require intensive routine histopathological workload with serial sectioning and tumor-specific immunohistochemistry on at least 3 layers, including 30%, 50% and 75% of SLN thickness, with expectation of less than 9.5% of missed metastases, which appear to be time- and cost-effective. Eventual improvements of detection accuracy could be obtained by cell separation technique and pellet examination, as well as with high sensitivity techniques, especially RT-PCR, but both are still remaining to be evaluated for a routine procedure of standard samples. While SLN negativity in breast cancer patients implies almost certain metastases-free lymph nodes status, the same, still, does not rule-out possibility of false negativity in melanoma patients. Overall, regardless of the extent of histopathological labor, SLN examination significantly improves accurate staging of solid malignancies, updating the adequacy of treatment modalities, with major improvements still remaining to develop.

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death has been reported following the intravenous administration of compounds similar to IB. Severe reactions to IB may be manifested by edema of the face and glottis, respiratory distress or shock; such reactions may prove fatal unless promptly controlled by such emergency measures as maintenance of a clear airway and immediate use of oxygen and resuscitative drugs. Like other sensitivity phenomena, severe reactions are more likely to occur in patients with a personal or family history of bronchial asthma, significant allergies, drug reactions or previous reactions to triphenylmethane dyes.

In one of the largest prospective studies to adverse reactions to IB, carried out in USA, thirty-nine of 2392 patients (1.6%) had a documented allergic reaction during the mapping procedure (9).

Most reactions (69%) produced urticaria, blue hives, a generalized rash, or pruritus. The incidence of hypotensive reactions was 0.5%. In this trial, patients with a sulfa allergy did not display a cross-sensitivity to IB (9).

Out of two patients with reported hypotension and hypoxia in report of Laurie et al. (10), one required intubation, while another one suffered prolonged hypotension. Both patients recovered without sequelae (10).

Blue urticaria as a previously unreported adverse event associated with IB has been reported by Sadig et al. (1).

With 639 consecutive SLNBs for breast cancer performed by Albo et al., 1.1% of patients had severe anaphylactic reactions to IB requiring vigorous resuscitation, while in one patient, the anaphylactic reaction required termination of the operation (5).

Five cases with adverse reactions to IB, of 267 patients, were reviewed by Cimmino et al. (11). The two patients with anaphylaxis experienced cardiovascular collapse, erythema, perioral edema, urticaria, and uvaria edema. The blue hives in 3 patients resolved and transformed to blue patches during the course of the procedures. The incidence of allergic reactions in this series was 2.0% (11).

The three cases that varied in severity from treatable hypotension with urticaria and arthemia to severe cardiovascular collapse with or without bronchospasm or urticaria, were reported by Leong et al., out of 406 patients who underwent intraoperative lymphatic mapping with IB (6).

Hoskin and Granger report that absorption of the dye into the circulation may interfere with pulse oximetry, causing falsely low readings (12). IB as a cause of pulse oximetry desaturation is also reported in some other studies (13,14).

Lymphatic mapping with blue dye may cause severe adverse reactions and therefore operating room personnel who participate in intraoperative lymphatic mapping where isosulfan blue is used must be aware of the potential consequences. That is why this procedure require a setting of anesthesiology protocol, which may consider the next:

(a) the lymphographic procedure which involves the use of IB should be carried out under the direction of personnel with the prerequisite training and with a thorough knowledge of the procedure to be performed,

(b) after subcutaneous administration of IB, competent personnel and emergency facilities should be available for at least 30 to 60 minutes, since severe delayed reactions have been known to occur with similar compounds,

(c) as physicians expand the role of SLN mapping, they should consider the use of histamine blockers as prophylaxis and have emergency treatment readily available to treat the life-threatening complication of anaphylactic reaction.

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REFERENCES


