SEASON TWO
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High sensitivity and negative predictive value of methylene blue as a single technique in sentinel lymph node mapping: a prospective study on 25 dogs with low-grade cutaneous mast cell tumors

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In oncology, the identification of sentinel lymph nodes (SLNs) aims at mapping lymphatic drainage and helps in staging the disease and assessing prognosis [1]. In canine cutaneous mast cell tumors (cMCTS), lymph node involvement is an important prognostic factor, and lymphadenectomy is not influenced by the positive or negative status of SLNs, as it has been recommended regardless [2,3]. However, regional lymph nodes (RLNs) and SLNs may not match in up to 25% of cases. The gold standard technique for SLNs identification includes the combined use of preoperative imaging techniques and intraoperative blue dye, nevertheless, this is not always feasible in daily practice due to costs or equipment unavailability [4,5].

Aims of this non-randomized prospective study were to evaluate the sensitivity and negative predictive value (NPV) of methylene blue (MB) staining alone in the assessment of SLNs in dogs with low-grade cMCTs and to determine whether non-dyecapturing nodes in the same lymphocentrum were histologically metastases-free.

Dogs with cytologically low-grade cMCTs amenable to curative surgery and no evidence of distant metastasis based on a complete staging work-up were eligible for recruitment. RLNs were identified based on anatomic location.

A total volume of 0.4 ml of 1% MB was injected peritumorally, 0.1 ml at each cardinal point, using a 26 Gauge needle syringe. In order to reduce the risk of degranulation, no massage was performed on the tumor after dye injection.

All dogs underwent wide surgical excision of cMCT and lymphadenectomy of RLNs, regardless of their staining. Resected tumors underwent histopathologic evaluation and only histologically-confirmed low-grade cMCTs were ultimately included. All RLNs were microscopically examined after hematoxylin-eosin and toluidine blue staining and classified according to Weishaar [6].

Twenty-five dogs were enrolled and 60 RLNs were excised. Thirty-one (51.7%) RLNs were not dye-capturing and 29 (48.3%) RLNs were dye-capturing. Not dye-capturing RLNs were removed if considered suspicious (anatomical proximity to dye-capturing RLNs or having a lymphatic blue channel). Histologic examination of not dye-capturing RLNs revealed 30 (97 %) HN0/HN1 and one (3%) HN2 RLNs. None was overtly metastatic (HN3). Complications related to MB injection did not occur.

NPV of intraoperative MB staining in identifying RLNs as non-metastatic was 96%; with 94% sensitivity. Intraoperative MB is reliable and feasible in identifying non-metastatic RLNs in dogs with low-grade cMCT, that can be done in clinical settings with limited access to the supporting combination technique. Excision of not dye-capturing RLNs may provide no benefit to this population of dogs.

Bibliography

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