Diagnostic accuracy of optical coherence tomography for assessing surgical margins of canine soft tissue sarcomas in observers of different specialties

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Abstract:

Introduction*:* Optical coherence tomography (OCT) is a high-resolution microscopic imaging technique that has been proven efficacious in identifying positive margins real-time in human breast cancer patients and differentiating canine soft tissue sarcoma (STS) from normal tissues. The efficacy of OCT for surgical margin assessment has not been assessed in veterinary patients. The objective of this study was to determine the diagnostic accuracy of OCT to assess surgical margins after resection of canine STS and determine the influence of observer specialty and training.

Materials & Methods*:* Twenty-five dogs with STSs were included in this study. *In vivo* and *ex vivo* surgical margins were imaged with a spectral domain OCT system after tumor resection. Representative images and videos were used to generate a training presentation and data sets which were completed by 16 observers of 4 specialties (surgery (S), radiology (R), pathology (P) and OCT researchers) and classified them as cancerous or non-cancerous after completion of a training presentation.

Results*:* The overall sensitivity and specificity were 88.2% and 92.8% for *in vivo* tissues and 82.5% and 93.3% for *ex vivo* specimens, respectively. The overall accurate classification for all specimens was 91.4% *in vivo* and 89.5% *ex vivo,* respectively. There was no difference in accuracy of interpretation of OCT imaging by observers of different specialties or experience levels.

Conclusions: Use of OCT to accurately assess surgical margins following STS excision was associated with a high sensitivity and specificity amongst various specialties. A wide variety of personnel could effectively be educated to interpret OCT imaging.

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