Sensitivity and specificity of the PCR-based lymphocyte clonality assay for the diagnosis of B- and T-cell lymphoma in cats

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Background & Objectives

With an incidence of 2 per 1,000 individuals, lymphoma is the most common haematopoietic neoplasia in cats. Evaluation of a fine needle aspirate is often the first step in the diagnostic work-up. Diagnostic classification of infiltrates consisting of well differentiated small lymphoid cells is often challenging and the differentiation between a resident mature lymphocyte population and small cell lymphoma cannot be made by cytology alone.

These cases warrant the application of complementary tools like PCR-based immunoglobulin (IG) and T-cell receptor (TCR) clonality testing (PARR) for confirmation. In this study, we evaluated diagnostic sensitivity and specificity of the PARR assay with specified primer sets for routine diagnosis of feline IG heavy chain (IGH2 and IGH3) and TCR gamma (TCRG) gene rearrangements.

Results of illustrative examples

Images of H&E-stained histopathologic and DiffQuick®-stained cytologic samples are compared with the obtained electropherograms of the clonality assays. In the clonality assays, IGH (IGH2 and IGH3) or IGH (VFRI and VFRII mix) indicate B-cell clonality, and TCRα (TCRα) or TCRα (TCRα-2γ) T-cell clonality. Black arrows indicate the peaks of the alignment marker at 15 bp and 1000 bp.

Sample Material

Material from 20 cats with lymphoma confirmed by histopathology and lymphoid tissue from 10 cats without lymphoma collected from patients at the Vetmeduni Vienna from April 2013 to February 2016 were evaluated by clonality testing.

The samples consisted of stained cytology slides, single cell suspensions (sccs), fresh solid tissue samples and one biopsy. The anatomic sites of the samples were highly variable.

Sample Material

Clonality testing outcome

Summary & Conclusions

- We tested two PCR primer sets for clonality testing on 30 matched cytological and histopathological reviewed specimens.
- Primer set B exhibited an overall better performance, tending to be more prone for cross-lineage detection.
- Diagnostic sensitivity and specificity of the clonality assay were 70% and 90%. Overall diagnostic accuracy was 77%.