Evaluation of sagittal T2W versus STIR sequences in the localisation of canine IVDD with low-field MRI

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INTRODUCTION

Sagittal T2-weighted sequences (T2W) are the mainstay of spinal protocols in MRI, with regards to initial lesion localisation. This presumptive localisation guides the more focussed acquisition of additional sequences when further characterising the pathology in question. We regularly employ the use of short tau inversion recovery (STIR), as anecdotally STIR can be useful in identifying IVDD (or associated spinal cord pathology) in instances where sagittal T2W has proved unrewarding. We hypothesised that STIR would provide better sensitivity than T2W in the detection of IVDD during preliminary sagittal screening. This retrospective study was designed to determine if sagittal STIR could be considered as an alternative to T2W in low-field MRI spinal protocols.

MATERIALS AND METHODS

Dogs (n=113) who underwent spinal MRI (0.4T Hitachi) at DWR between January 2010 and October 2014 were retrospectively recruited. The test population (n=94) inclusion

criteria required both T2W and STIR sagittal sequences, an MRI diagnosis of IVDD, and surgical confirmation of IVDD and disc localisation. Control patients (n=19) with unremarkable MRI findings were included in the study. The T2W and STIR images were randomised and blindly-reviewed by a board-certified radiologist and neurologist. Both interpreters independently reported the suspected location of IVDD and extent of cord compression (reflecting the location that would be recommended for further MRI evaluation in a clinical setting), extrusion versus protrusion, visible secondary pathology, and their diagnostic confidence.

RESULTS

IVDD location was correctly identified more frequently with T2W (125/188) versus STIR (108/188). Fewer false negative diagnoses were obtained with T2W (5/188) versus STIR (8/188). Fewer false positive diagnoses were made with STIR (13/38) versus T2W (14/38). STIR accurately localised IVDD in 42.9% patients (27/63) where T2W had previously resulted in mis-localisation or false negative diagnosis. Consequently, had both STIR and T2W been reviewed in combination, the sensitivity for IVDD localisation would have risen to 80.9%.

CONCLUSION

Our hypothesis was rejected. The sensitivity for IVDD localisation was better for sagittal T2W than comparable STIR sequences. We cannot therefore recommend replacing T2W with STIR in spinal protocols. The study however highlights that STIR is capable of identifying disc pathology otherwise inconspicuous in T2W. We therefore conclude that sagittal STIR should be considered a useful adjunct to sagittal T2W during lesion localisation in spinal MRI.

Randomized controlled evaluation of techniques for ultrasound-guided fine needle aspiration of the liver

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INTRODUCTION

Ultrasound-guided fine needle aspiration (FNA) is well established as a relatively safe technique for the cytological sampling of abdominal organs. However, there is some controversy over exact technique; specifically whether suction (aspiration) should be applied during sampling. Potentially, aspiration can result in greater blood contamination, but conversely, non-aspiration may result in a lower cell harvest. Limited evidence

from human medicine suggests that non-aspiration may be the better technique for some organs. However, direct comparisons in abdominal organs such as the liver are lacking for both human and veterinary patients.

AIMS

To compare the quality and diagnostic value of cytological samples from the liver obtained by the two different FNA methods and determine if one technique is superior to the other.

METHODS

Dogs that required ultrasound-guided FNA of the liver as part of their normal clinical investigation were recruited and randomly assigned to one of two groups for sampling by an aspiration (Asp) or non-aspiration technique (Non-Asp). Obtained slides were blindly reviewed by external cytopathologists unaware of the technique used. Cytological reports were reviewed for their overall diagnostic value, with cell harvest/cellularity, cell preservation and haemodilution also recorded. Chi-squared statistical analysis was performed to determine if there was a significant difference in the prevalence of diagnostic samples between the groups. Sample size calculations estimated at least 117 dogs were required.

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