

EVALUATION OF ABNORMALITIES OF THE NAVICULAR SPONGIOSA: CORRELATION BETWEEN RADIOGRAPHIC AND MAGNETIC RESONANCE FINDINGS

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The aim of the study was to investigate the correlation between radiological and magnetic resonance (MRI) findings observed in the navicular bone (NB) spongiosa.

Radiographic examination is the first step in the diagnosis of navicular disease in horse even if it had low sensitivity in identifying medullar abnormalities [1] while MRI is considered the gold standard in the evaluation of the navicular bone [2].

Horses were selected for inclusion in the study that had lameness localized to the foot, undergone both radiographic and low-field MRI examinations of the foot in the period between February 2007 and May 2017.

Navicular spongiosa was graded in both radiographic and MR images with a grading system composed by a number that indicated the gravity of lesion and by a letter to state the localization of the abnormalities. Sensitivity, specificity, positive and negative predictive value of radiography for identification of spongiosa abnormalities were calculated considering MRI as gold standard. A K-Cohen test was used to calculate the association between NB spongiosa grades obtained using radiological and MRI examination.

The distribution between categories was evaluated using a Chi-square test. Intra-observer agreement have been calculated using a K-Cohen test.

Ninety-four horses were included in the study and a total amount of 129 navicular bones have been evaluated.

The sensitivity of radiology in identification of spongiosa abnormalities was 80%, the specificity was 100%, the positive and the negative predictive value were respectively of 100% and 52%. Intra-observer agreement was substantial (0.88). There was a statistically significant difference between the distribution of the overall grades of the NB while the association between radiographic and MRI examinations was moderate (0.473).

Despite the moderate correlation between radiographic and MRI grades, x-rays allowed to recognize the presence of cystic-like lesions in the 85.7% of cases observed on MRI images; cyst-like lesions have been not detected when localized in the more distal aspect of NB. A good correlation (95.8%) was observed in absence of lesions. X-rays were less sensitive than MRI in detecting mild alterations of NB spongiosa and unable to detect those localized in the proximal border. Using radiography, abnormalities of the distal border were overestimated when of low grade and underestimated when of high grade.

Radiography had a rather low sensitivity for identifying NB spongiosa abnormalities especially when localized in the proximal and distal border or when of low grade and MRI had to be considered the gold standard in the evaluation of NB [3].

[1] Dyson et al. Current concepts of navicular disease, *Equine Vet Educ*, 23:27-39, 2006. [2] Sampson et al. Magnetic resonance imaging findings in horses with recent onset navicular syndrome but without radiographic abnormalities, *Vet Radiol Ultrasound*, 50:339-346, 2009. [3] Murray et al. How does magnetic resonance imaging represent histologic findings in the equine digit? *Vet Radiol Ultrasound*, 47:17-31, 2006.