

7 Summary

The applicability of the anatomical M-mode in comparison with conventional methods of equine echocardiography

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In this study an ultrasound examination of the heart using two-dimensional B-mode, conventional M-mode and doppler echocardiography was performed in 34 warm-blood horses. Anatomical M-mode images were obtained by digital reconstruction from two-dimensional cineloops. 28 horses were divided into three groups according to the results of the examinations. The control group (n=10) did not show clinical signs of heart disease. The second group (n=11) consisted of horses with heart murmurs grade II/VI but without alteration of cardiac dimensions. In the third group (n=7) horses with heart murmurs and with cardiac dilatation were combined. The classification into group two and three was based on left atrium diameters and left ventricle diameters immediately below the mitral valve measured in right caudal long axis view. The remaining six patients showed signs of atrial fibrillation and are documented as case studies.

Fractional shortening (FS%) and other heart dimensions were determined by using four image planes:

- right caudal long axis view below the mitral valve
- right caudal long axis view in the region of papillary muscles
- right caudal short axis view below the mitral valve
- right caudal short axis view in the region of papillary muscles

The aim of this study was to test the feasibility of the anatomical M-mode as a useful tool in equine cardiology. In addition the accuracy of scan-planes in the M-mode to get FS% reference ranges with lower variability should be improved.

Results obtained by using the B-mode technique had higher degree of correlation with those of the anatomical M-mode than with those of the conventional M-mode. The artificial cursor of the anatomical M-mode allowed free orientation within the two-dimensional sector. Orthogonal scan-planes of the heart structures could be created with scan-planes equalling those of the B-mode by using this cursor. As a result perfect alignment with

the target structure could be achieved by using the M-mode technique. This was not always practicable with conventional M-mode.

The variability of FS% could not be reduced because of intraindividual variation of the intracardiac landmarks.

This study showed anatomical M-mode to be feasible for cardiology in horses with parameters measured in anatomical M-mode correlating very closely to those measured in B-mode and conventional M-mode. Since the anatomical M-mode is a postprocessing of a two-dimensional B-mode cine loop using only B-Mode could shorten the time of echocardiographic examination.