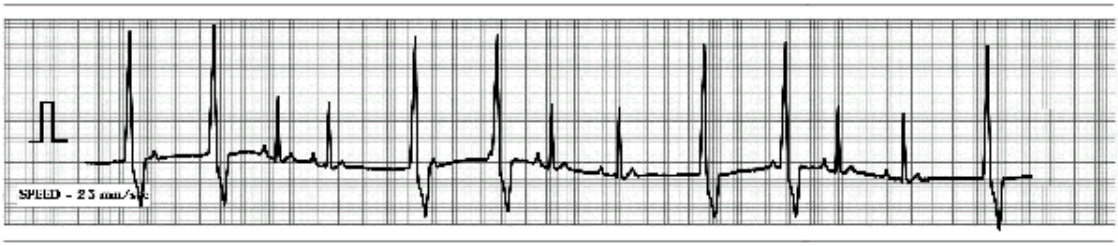
ECG Quiz

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The lead II ECG strip was recorded from a 3 year-old, male, German Shepherd weighing 32.4 kg, with a history of anorexia, lethargy and vomiting. Physical examination revealed hyperpyrexia (104.8 ^{o}F) and an enlarged abdomen. The dog had a history of prednisolone therapy for a period of 3 months for the treatment of skin disease. Blood chemistry profiles showed an elevation of both serum ALT (728 U/L) and serum alkaline phosphatase (1924 U/L). A complete blood count showed a normal number of both red blood cells and white blood cells. A thoracic radiograph revealed normal heart size and lungs.

Please make your interpretation before turning to the next page.

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Respiratory sinus arrhythmia with a second degree atrioventricular block and ventricular ectopic beats.

The heart rate was approximately 76 beats/min. From the lead II strip, 6 sinus beats and 7 ventricular ectopic beats were found. The R-R interval of the sinus beats was not constant which could be due to respiratory sinus arrhythmia. The ventricular ectopic beats were characterized by a bizarre and wide QRS shape. Please notice the pauses between the first ectopic beat and the normal sinus beats, which had approximately the same duration. The ventricle can generate impulses after a long pause caused by the blockage of the impulse at the level of AV node. The ventricular rate was slower than the sinus rate (68 vs 92 beats/min). It was noted that the first P wave was seen after the ventricular ectopic beat and did not conduct through the ventricle since it was not followed by a normal QRS complex. One P wave was seen after the T wave (complex 5), while one was seen just before the QRS of ectopic beats (complex 6). One P wave was buried inside the QRS complex of the ectopic beats (complex 9). All of these were non-conducted P waves, since the AV node was in refractoriness, due to the ventricular ectopic beats. The presence of P waves without a conducted QRS complex, suggested that a second degree AV block occurred. When the ventricle was silent for a period of time, the ventricle would generate an impulse and start to contract by itself independent of the atrium, which is usually seen in high grade blocks known as "complete AV dissociation or third degree AV block". However, since we still saw the conducted P wave (normal sinus beat), the term "second degree AV block" was used in this case. A switch between second and third degree AV block is commonly seen. Since the rate of ventricular contraction was still high, cardiac output should be adequate and no medication was required. The dog should be checked regularly to see whether any interruption of the AV node was occuring.