Sonographic Parameters of Adrenal Glands in 19 Addisonian Dogs

E Lindquist1
J Frank1
K Marek1

1SonoPath.com/New Jersey Mobile Associates, Sparta, NJ, USA

Canine hypoadrenocorticism is typified by variable non-specific clinical signs. Therefore, dogs with undiagnosed hypoadrenocorticism may present for abdominal sonography as part of the medical work-up. The purpose of this study was to identify a reliable set of ultrasonographic parameters for adrenal gland size and appearance that may be used to increase the index of suspicion of typical or atypical hypoadrenocorticism.

Abdominal ultrasound was performed on three groups of dogs. Adrenal gland measurements and morphology were retrospectively reviewed. Group 1 consisted of dogs confirmed with typical or atypical hypoadrenocorticism by ACTH stimulation (n = 19). Group 2 included dogs initially suspected to have hypoadrenocorticism based on clinical signs and/or ultrasonographic appearance of adrenal glands, but ultimately had a normal ACTH stimulation test (n = 11). Group 3 consisted of control dogs with no clinical signs or biochemical evidence of hypo- or hyperadrenocorticism (n = 22).

The mean values/standard deviation for adrenal gland measurements were: R adrenal (Radr) length: group 1: 1.76 ± 0.58 cm, group 2: 1.87 ± 0.7 cm, group 3: 2.06 ± 0.53 cm; Radr width: group 1: 0.34 ± 0.08 cm, group 2: 0.39 ± 0.13 cm, group 3: 0.63 ± 0.11 cm; left adrenal (Ladr) length: group 1: 1.84 ± 0.74 cm, group 2: 2.14 ± 0.56 cm, group 3: 0.7 ± 0.47 cm; Ladr width: group 1: 0.32 ± 0.11 cm, group 2: 0.41 ± 0.09 cm, group 3: 0.58 ± 0.11 cm.

An ANOVA demonstrated a significant effect of group on the 4 different measures (F = 7.79, p < 0.001). Subsequent t-tests were performed to evaluate differences between the groups. Statistically significant differences were noted when comparing the Radr width between groups 1 and 3 (p < 0.001) and between groups 2 and 3 (p < 0.001) as well as significant differences in Ladr width between groups 1 and 3 (p = 0.001) and groups 2 and 3 (p = 0.001). There was no significance when comparing the lengths of the adrenal glands between groups. There were no differences in the measurements between groups 1 and 2 (p > 0.2) except for Ladr width (p < 0.05). The sonographer also noticed a reliable morphologic pattern of flattened capsular contour and isoechogenic parenchyma in groups 1 and 2.

Sonographic identification of small, flattened, isoechogenic adrenals is not diagnostic for hypoadrenocorticism and can be seen in other sick dogs; however, these findings should alert the clinician to its possibility thus prompting additional function testing.

Special thanks to Tomie Timon RDMS, Andi Parkinson RDMS, and Doug Casey DVM, DABVP for their collaboration on this study.

NORMAL ADRENALS

ADDISONIAN ADRENALS