

# Assessment of Feline Abdominal Adipose Tissue Using Computed Tomography

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**Purpose:** Obesity is a common nutritional disorder in cats and it increases the risk factors for various diseases such as diabetes, pancreatitis, arthritis and cardiovascular disorders. Computed tomography is an optimal technique for the accurate assessment of adipose tissue in humans and it also allows separate evaluation of visceral (VAT) and subcutaneous adipose tissue (SAT). The aim of this study is to establish a method for evaluation of feline obesity using computed tomography. In addition, we assessed the differences in the relative amounts of VAT and SAT between the normal and obese cats.

**Materials and Methods:** Nineteen healthy cats, weighing 3.3 – 7 kg, were studied. Cats with 30% or above body mass index (BMI) were group as obese (n = 4) and those with less than 30% were grouped as normal (n = 15). All cats were given helical CT scan from the diaphragm to the sacroiliac articulation. Attenuation range of feline adipose tissue was determined from histogram obtained at the level of L3, L5 and L7. Peak Hounsfield Unit (HU) value of the adipose tissue  $\pm$  2SD was calculated using the method that McEvoy suggested. With this range, areas of the total adipose tissue (TAT), visceral adipose tissue (VAT) and subcutaneous adipose tissue (SAT) were obtained at T12, L1, L3, L5 and L7 level as well as the volume for the entire abdomen.

**Results:** The attenuation range of the feline adipose tissue was determined as the range from -156 to -106 HU. There were significant differences in the areas of the VAT ( $P < 0.0001$ ) and SAT ( $P < 0.0001$ ) but not in the TAT ( $P = 0.6103$ ) at the cross sectional images of T12, L1, L3, L5 and L7. The TAT/total volume ( $0.30 \pm 0.10$ ), VAT/TAT ( $0.53 \pm 0.08$ ) and VAT/SAT ( $1.18 \pm 0.32$ ) volume ratios were highly correlated with the area ratios at the L3 ( $r = 0.96, 0.90, 0.81, P < 0.0001$ ) and L5 level ( $r = 0.97, 0.88, 0.87, P < 0.0001$ ). The obese group had higher TAT/total volume ( $P = 0.0956$ ) and lower VAT/SAT ( $P = 0.0245$ ) volume ratios compared to the normal group.

**Conclusion:** Computed tomography is useful to assess the visceral and subcutaneous adipose tissue in cats. The cross-sectional images of L3 and L5 represent the ratio of TAT, VAT and SAT of the entire abdomen. It is revealed that obese cats have lower VAT/SAT ratio than that of normal cats in this study.

**Key words:** cat, abdominal adipose tissue, computed tomography

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