PERIRENAL FAT SURFACE AREA IS A SIMPLE AND RELIABLE TECHNIQUE FOR PRE-OPERATIVE VISCERAL ADIPOSE TISSUE EVALUATION.

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BACKGROUND

Visceral adipose tissue (VAT) is an independent risk factor of morbidity and technical difficulties in abdominal and pelvic surgery (Fig. 1) and of general metabolic disorders. VAT has been shown to be of higher predictive value than body mass index (BMI) or waist-to-hip ratio (WHR) regarding these complications. CT or MRI VAT surface quantification at L2-L3 is the gold-standard method for VAT evaluation but remains time consuming and technically demanding. Perirenal adipose tissue (PRAT) surface area is a simple measure which can be easily performed. We aim to prove that PRAT is a reliable method for simplified VAT evaluation.

MATERIAL AND METHODS

We ran a prospective observational cohort study at the Geneva University Hospital. One hundred consecutive patients (45 male) undergoing elective colorectal surgery with a mean age of 64.3 years (SD ± 14.8) were identified and pre-operative CT scans were obtained. VAT surface was measured at the L2-L3 level using Osiris® software. The distinction between different tissues was based on Hounsfield units (HU) with a threshold range of -190 to -30 HU for fat tissue. PRAT surface was measured on an axial CT slice at the level of the left renal vein following the anterior renal fascia to the laterocimal ligament and encompassing the posterior perirenal fat and retroperitoneal fat below the Zuckerkan and fascia (Fig. 2), using a standard DICOM viewer (Osiris®, Fig. 3). Other morphologic parameters included BMI and waist-to-hip ratio (WHR). Statistical analysis was based on correlation study using Spearman rank correlation coefficient (r) between these morphologic parameters. Correlation coefficient r above 0.80 was chosen as acceptable to validate PRAT as a reliable evaluation of VAT.

RESULTS

Mean VAT was 152.89 cm² (SD: ±131.64), mean PRAT 22.42 cm² (SD: ±23.12), mean BMI 25.38 kg/m² (SD: ±5.39) and mean WHR 0.96 (SD: ±0.08). Spearman rank correlation coefficient between VAT and PRAT was r=0.87 (null hypothesis theoretical r=0.326 for 100 patients and p=0.0005 according to Spearman’s table) (Fig. 4). Correlations between BMI and VAT (r=0.70), and WHR and VAT (r=0.61) were tested and statistically significant (r=0.326), but according to the t-test of Williams, the correlation between PRAT and VAT is statistically stronger than the correlation between BMI and VAT (p-value BMI-PRAT 3.10⁻⁸), or between WHR and VAT (p-value WHR-PRAT 2.2.10⁻¹³).

CONCLUSION

Perirenal fat surface area measurement is a simple and reliable method for visceral adipose tissue evaluation and can be used as a surrogate of time-consuming measurement of visceral adipose tissue (Fig. 5).

REFERENCES