Researchers at the University of South Florida have developed a scoring system to predict the perinephric fat surface density (PnFSD) of renal cell carcinoma (RCC) patients.

Renal cell carcinoma currently accounts for 90% of all new renal malignancies. The treatment modalities currently available to patients presenting with suspicious small renal masses include partial nephrectomy, radical nephrectomy, ablative therapies, and active surveillance in select cases. Partial nephrectomy surgical dissection is a choice treatment due to several factors including the size and location of the renal tumor and its relation relative to the renal hilar vessels and urinary collecting system. In addition, a significant component of the ease/difficulty of the partial nephrectomy pertains to the quality and quantity of perinephric fat in that given renal unit.

The presence of thick and adherent “sticky” perinephric fat in renal sparing surgery can complicate the procedure and impair the abilities to clearly delineate the surgical boundaries of an underlying renal neoplasm at the surface of the kidney. The “sticky fat” can add a great deal of time and challenge to the surgical procedure. Mean total operative time in patients with such adherent fat properties undergoing open or minimally invasive surgery can be up to 1 hour longer than patients without sticky fat in addition to potentially impairing the ability to visualize the edges of the renal parenchyma to be resected. Visualization of the perinephric fat is needed to provide data for a patient’s surgery. Perinephric fat densities can be practically obtained from preoperative CT imaging to identify “sticky fat” and act as a strong indicator of perioperative fat surgical dissection difficulty.

Our inventors have prospectively assessed the ease of surgical dissection of perinephric fat at time of open partial nephrectomy and positively correlated this endpoint with pre-operative perinephric fat density. Accurate pre-operative assessment of perinephric fat density has far reaching implications as it provides surgeons and patients with data pertaining to the anticipated ease of the surgical procedure which can help delineate the best surgical approach, likely outcomes, and aid in pre-operative patient surgical counseling and education.

**ADVANTAGES:**

- Aid preoperative preparation for partial nephrectomy
- Allows the physician to better predict complications prior to surgery
- Optimize surgical scheduling
- Improve patient counseling

**Predict Partial Nephrectomy Complications**

Receiver-operating characteristic (ROC) curves for 6 different predictive models were created to visualize the predictive enhancement of perinephric fat dissection (PnFSD). ROC curves predict difficulty of PnFSD. The area under the ROC curve (AUC) measured the discrimination ability of the respective models. An AUC of 0.5 indicates random prediction while a score of 1 indicates a perfect prediction by the proposed statistical model. Certain characteristics such as age, gender, body mass index (BMI), and Fuhrman grades, demonstrate an ability to predict the difficulty of perinephric fat dissections.

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