Investigating A Novel Modifiable Factor Affecting Renal Function After Partial Nephrectomy: Cortical Renorrhaphy

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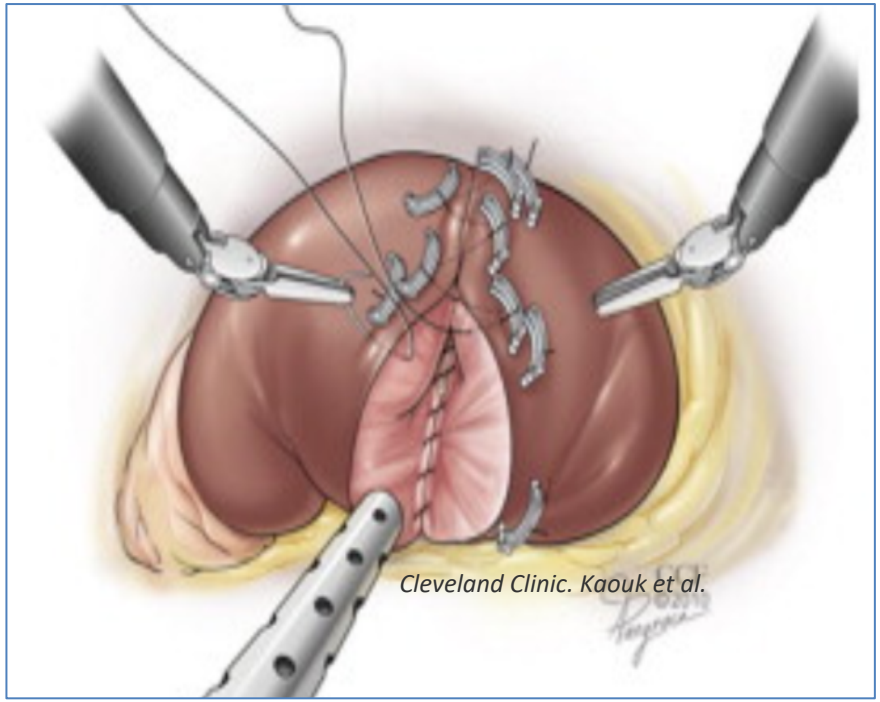
INTRODUCTION AND OBJECTIVE

- Renorrhaphy of the cortical/superficial layer is routinely performed during partial nephrectomy, but the contribution to renal volume loss is not well studied. Cortical renorrhaphy is hypothesized to be a modifiable factor affecting renal function after partial nephrectomy.



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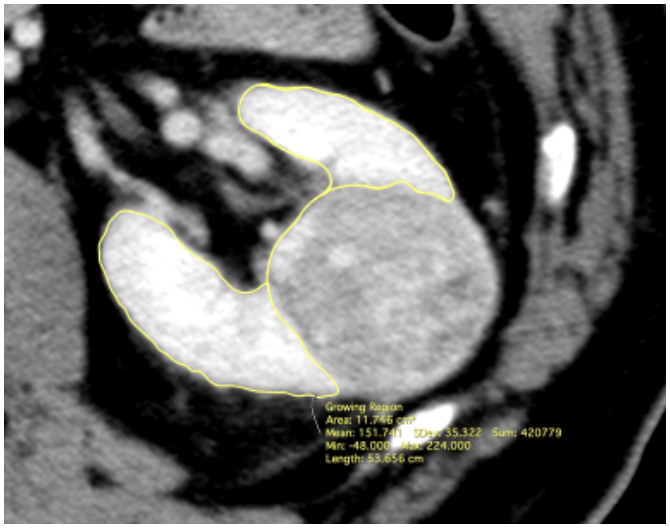
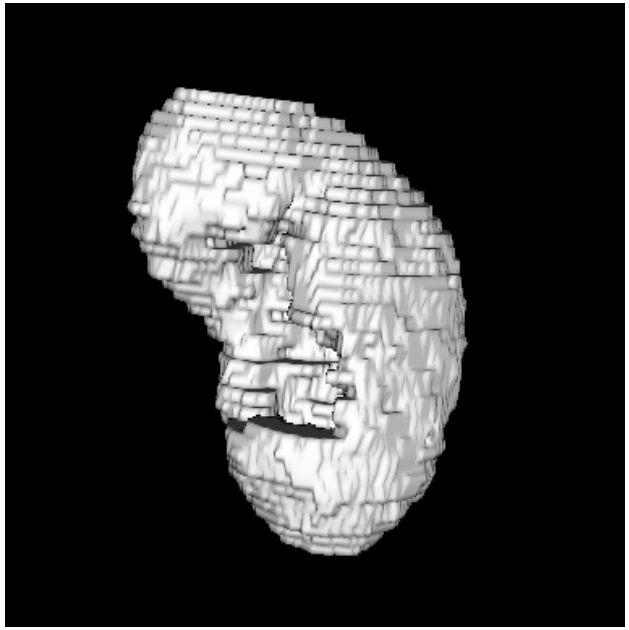
METHODS

- A randomized, controlled trial was conducted with 1:1 allocation between cortical renorrhaphy and no cortical renorrhaphy during robotic partial nephrectomy.
- Sutures for hemostasis and collecting system closure were placed in all cases.
- Power analysis recommended a sample size of n=20 per group.
- An interim analysis was performed at 5 years due to slow accrual.
- 3D renal models were constructed using semi-automatic segmentation and planimetry prior to surgery and at approximately 4-months after tumor resection to determine volume loss in the operated kidney.
- Welch's t-test was used with statistical significance defined as $p<0.05$.





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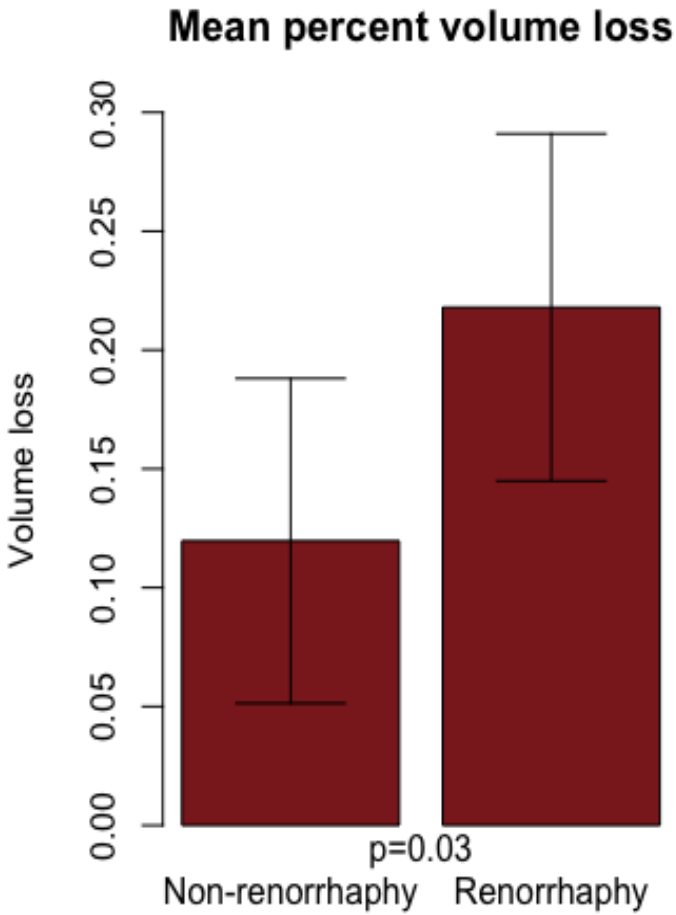
RESULTS

- At interim analysis, 10 were randomized to the non-renorrhaphy group and 8 to the cortical renorrhaphy group.
- **Tumor diameter (3.2 vs. 3.1cm, p=0.67) and warm ischemia time (18 vs. 17 minutes, p=0.63) were similar between the groups.**
- The two groups had matched demographics including age (p=0.82), sex (p=1), BMI (p=0.40), RENAL nephrometry score (p=0.69), diabetic status (p=0.28), and hypertension status (p=0.67).
- **The median (range) volume loss in the non-renorrhaphy group, 12% (0-24%), was lower than the cortical renorrhaphy group, 22% (12-39%), p=0.03.**
- **At the one-month mark, the % creatinine change was higher in the renorrhaphy group (7.5% vs -4.4%, p=0.049).**
- There was one Clavien 3 complication in each group: the renorrhaphy group had one urine leak requiring a drain, and the non-renorrhaphy group had one postoperative bleed requiring selective embolization.



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CONCLUSIONS

This small randomized trial found increased creatinine and volume loss in the cortical renorrhaphy group. Omitting cortical renorrhaphy may result in better preservation of kidney volume and function.