



Original article

## Increased use of antihypertensive medications after partial nephrectomy vs. radical nephrectomy

Ryan Hutchinson, M.D., Nirmish Singla, M.D., Laura-Maria Krabbe, M.D.,  
Solomon Woldu, M.D., Gong Chen, Charles Rew, Isamu Tachibana, Yair Lotan, M.D.,  
Jeffrey A. Cadeddu, M.D., Vitaly Margulis, M.D.\*

*Department of Urology, University of Texas Southwestern Medical Center, Dallas, TX*

Received 29 December 2016; received in revised form 12 April 2017; accepted 21 June 2017

### Abstract

**Purpose:** A prospective study of partial vs. radical nephrectomy demonstrated worse overall survival in patients undergoing partial nephrectomy which appeared to be driven by cardiovascular outcomes. We sought to determine if the blood pressures or use of antihypertensive medications differed between patients who underwent partial or radical nephrectomy.

**Materials and methods:** A tertiary-referral institutional renal mass database was queried for patients between 2006 and 2012 undergoing partial or radical nephrectomy. Serial blood pressure follow-up, clinicopathologic variables, and changes in medications were collected. Patients were excluded for inadequate data, noncurative-intent surgery, noncancer surgical indication, and absence of medication information. Time-dependent hemodynamic changes were compared by split-plot analysis of variance and addition to antihypertensive regimen was studied as time-to-event survival analyses with Kaplan-Meier curves and a Cox proportional hazards model.

**Results:** A final cohort of 264 partial nephrectomy and 130 radical nephrectomy cases were identified. Patients undergoing partial nephrectomy were younger, more likely to have T1 tumors, and had lower preoperative creatinine ( $P < 0.001$  for all). No differences were noted on postoperative hemodynamics ( $P > 0.05$ ). Significantly more patients who underwent partial nephrectomy added antihypertensive medications postoperatively ( $P \leq 0.001$ ) and surgical treatment remained as a significant independent predictor on Cox regression (hazard ratio = 2.51,  $P = 0.002$ ). Limitations include the retrospective nature of the study and potential for unidentified confounders.

**Conclusion:** Hemodynamic parameters after radical or partial nephrectomy may be different. The etiology of this observation, is currently unexplored. Additional prospective mechanistic investigations are warranted. © 2017 Elsevier Inc. All rights reserved.

**Keywords:** Partial nephrectomy; Small renal mass; Renal cell carcinoma; Blood pressure; EORTC

### 1. Introduction

The management of small renal masses has undergone a significant change in the last 20 years. Partial nephrectomy is currently recommended for T1a renal masses and adoption of partial nephrectomy, especially robotic partial nephrectomy, has been rapid [1,2]. Previously, partial nephrectomy was used in patients with imperative indications where radical nephrectomy would have a high likelihood of leaving patients in need of dialysis [3]. As concerns of oncologic equivalency were allayed by high-

quality data sets, other as-of-yet unexplained findings arose with respect to the survival difference between the procedures [4].

The only multicenter prospective, randomized study comparing radical to partial nephrectomy found equivalent oncologic outcomes between the procedures and, interestingly, significantly worse overall survival in patients undergoing partial nephrectomy [4]. This appeared to be driven by cardiovascular causes of mortality. Subsequent analyses of this study, European Organization for Research and Treatment of Cancer (EORTC) 30904, have confirmed superior renal function in patients undergoing partial nephrectomy [5], leaving the mechanism of the inferior survival, if any, unexplained.

\* Corresponding author. Tel.: +1-972-849-2180; fax: +1-214-648-8786.  
E-mail address: Vitaly.Margulis@UTSouthwestern.edu (V. Margulis).

Quality retrospective data sets have generally supported both the oncologic equivalency of partial nephrectomy and an equivalent or improved overall survival profile [6]. The hypothetical basis for these findings is that the improved postoperative renal function after partial nephrectomy leads to improved survival. Even this seemingly straightforward explanation may be nuanced as previous studies have shown a marked difference in the clinical implications of medically vs. surgically induced chronic kidney disease [7]. Partial nephrectomy could, in theory, lead to a number of hemodynamic effects that may lead to negative survival outcomes long-term. Pseudoaneurysm is a well-described complication of partial nephrectomy and implies the possibility of formation of asymptomatic arteriovenous fistulae at renorrhaphy sites [8]. Similarly, compression of kidney parenchyma within a relatively inflexible renal capsule, termed “Page kidney,” is a long recognized cause of atypical hypertension and modern renorrhaphy techniques generally use capsular compression to assist with control of venous bleeding. If these partial nephrectomy-specific surgical maneuvers do have meaningful effect on cardiovascular outcomes, hemodynamic parameters may be differentially altered postoperatively when comparing patients undergoing partial nephrectomy to those undergoing radical nephrectomy. We hypothesized that if partial nephrectomy results in adverse hemodynamic effects driving worsened overall survival, we may observe differential postsurgical effects on follow-up hemodynamic measurements and medical management of blood pressure.

## 2. Methods

Patients undergoing radical or partial nephrectomy between 2006 and 2012 were identified from an Institutional Review Board–approved retrospective institutional database. Patients were excluded if they had restricted access to their records, lacked at least one preoperative and postoperative blood pressure measurement, died within 30 days of surgery, had a functioning renal transplant in situ, or were operated on outside of the preset time frame. For survival analyses, patients without date-attributable antihypertensive medication histories were excluded.

Patients were defined to have medical comorbidities based on prescribed medications; hyperlipidemia was defined as on prescription lipid-altering medications including statins, niacin, and cholesterol binding agents. Hypertension was defined as being on oral antihypertensives including beta blockers, angiotensin-converting-enzyme inhibitors, angiotensin receptor blockers, diuretics, and calcium channel blockers. Diabetes was defined as any oral or injectable antihyperglycemic therapy and insulin-dependent diabetes was defined as the use of any injectable insulin or insulin analogue. Coronary artery disease and other vascular disease were defined if listed as a

comorbidity in the patient’s problem list or in their preoperative evaluation note.

## 3. Blood pressure and heart rate measurements

Hemodynamic changes were calculated by obtaining blood pressure and heart rate (HR) measurements from the electronic medical record at 4 defined time periods: 15 months to 1 week preoperatively, 1 to 15 months postoperatively, 15 to 36 months postoperatively, and 3 to 6 years postoperatively. All data points were entered as time-to-event with time zero defined as the date of surgery. For preoperative blood pressures 2 pressures were averaged whenever possible. If no measurements were available 1 week before surgery, the patient was excluded. All measurements were preferentially taken at closest time to surgery. For measurements between 1 and 15 months postoperatively, up to 2 were taken, at all other time points 1 measurement was taken if available.

## 4. Medications

The electronic medical record was queried for all medication entries both current and previous. Medication reconciliation was generally performed at the time of follow-up in the urology clinic and also at the time of any other health care encounter within the institutional health system. Medications listed as taken at the time of surgery were used to define baseline clinicopathologic characteristics as described earlier. Any change in antihypertensive medications was defined as any addition, removal, or modification of dose of a medication prescribed for hypertension; addition of antihypertensive was defined as a new antihypertensive medication prescribed in the postoperative period or an increase of dose of a previously taken medication.

## 5. Surgeries

Nephrectomies and partial nephrectomies were performed by 7 surgeons at our institution. Allocation to partial vs. radical nephrectomy was performed based on surgeon discretion with partial nephrectomy being preferentially offered during the time period to those patients with amenable tumors. Partial nephrectomy was performed with temporary hilar occlusion during tumor removal, and renorrhaphy was performed with capsular compression facilitated by bolstered sutures and a hemostatic bolster placed in the renorrhaphy bed when appropriate. Follow-up including medication reconciliation was generally performed every 3 to 6 months postoperatively for the first 2 years and annually thereafter.

Download English Version:

<https://daneshyari.com/en/article/5702506>

Download Persian Version:

<https://daneshyari.com/article/5702506>

[Daneshyari.com](https://daneshyari.com)