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Outcomes in patients undergoing nephrectomy for renal cancer on chronic anticoagulation therapy

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Abstract

Aims: To report our experience on surgical resection of renal tumors for patients with a history of chronic anticoagulation (ACT) or aspirin use.
Methods: We performed a retrospective analysis of 2473 patients who underwent surgery for renal tumors between 2005 and 2012. Prior to surgery, 172 were on chronic ACT and 695 on aspirin. Multivariable linear and logistic regression models were used to compare transfusion and overall complication rates between patients undergoing renal surgery who were on therapy to patients who were on aspirin and to patients with no therapy.
Results: Compared to no therapy and aspirin patients those on ACT were older (57.3 (IQR 48.4–66.10) vs 63.9, (IQR 57.3–71.5) vs 68.4, (IQR 60.4–73.5); $p < 0.001$), with a higher percentage having an ASA score of 3 or 4 (42.4 vs 57.9 vs 82.6%; $p < 0.001$), respectively. ACT patients had a higher 30-day transfusion rate, 22.7% vs 7.6% vs 6.9%, and 90-day complication rate, 17.4% vs 7.2% vs 7.3%, both $p < 0.001$. The median length of stay differed statistically between groups ($p < 0.001$), with a modest longer stay in the anticoagulation group (OR 1.11 SE 0.26; $p < 0.001$). Transfusion and complication rates for patients on therapy undergoing minimally invasive surgery vs open surgery were not statistically different.
Conclusions: Patients on chronic ACT had higher transfusion and overall complication rates compared to patients on no treatment or on chronic aspirin. These findings did not correlate to clinical differences in length of stay or grade 3–5 complications.

Keywords: Kidney neoplasms; Nephrectomy; Anticoagulants; Intraoperative complications

Introduction

Detection of incidental renal masses is an increasing occurrence in our contemporary healthcare system; this is likely due to the widespread use of abdominal imaging.[1] Concurrently, improvements in health care have prolonged the lives of our patients, and many with medical conditions often requiring the use of chronic anticoagulation therapy (ACT) now face the prospect of surgery. Approximately 4 million outpatients in the United States are receiving chronic oral ACT, with warfarin being the predominant form.[2,3] Chronic use of ACT may place these patients at increased risk for intraoperative and/or postoperative complications. Furthermore, interruption of therapy places the patient at increased risk for thromboembolic events.[4] Thus, it is crucial for patients who are on chronic ACT and undergoing elective surgery to be managed appropriately. Furthermore, aspirin as a cardioprotective agent has become a commonly prescribed medication. While it has been previously contraindicated for urological procedures, due to concerns of increased bleeding, several small retrospective studies have shown its continued use to be safe during robotic prostatectomies and during endoscopic resection of bladder cancer.[5–7]

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Patients with incidental renal masses have multiple treatment options, but surgical excision with either partial nephrectomy (PN) or radical nephrectomy (RN) continues to be the standard of care. Given the small sample sizes of previous reports,[8,9] we sought to assess the outcomes of patients who were being treated with chronic ACT following surgical treatment of their renal tumors. We compared our patients on ACT to patients on aspirin as well as to patients with no history of either therapy.

Materials and methods

After institutional review board approval, we performed a retrospective review of data for 2473 patients who underwent renal surgery at MSKCC between January 2005 and November 2012. We identified and analyzed data for 172 patients who were on chronic ACT and 695 on chronic aspirin (either 81 mg or 325 mg daily) prior to renal surgery. ACT included warfarin, clopidogrel, enoxapirin sodium, and tinzaparin sodium. Patients with aspirin use were not included in our ACT cohort. The consulting medical physician discontinued ACT prior to surgery within the recommended time based on the therapy used by the patient. Chronic warfarin therapy was discontinued 5–7 days prior to surgery and those patients were bridged to a short acting anticoagulant, which was discontinued 24 h prior to surgery. Clopidogrel was discontinued 5–7 days prior to surgery. Enoxapirin sodium and tinzaparin sodium were discontinued 24 h prior to surgery and aspirin was stopped 5–7 days prior to the surgery. All patients stopped their ACT or aspirin prior to surgery. Anticoagulation and aspirin therapy were restarted at time of discharge if the patient's vitals, urine output and hemoglobin remained stable. Adjuvant hemostatic agents, such as sealants, glues, and blood clot-inducing material, and meticulous intraoperative hemostasis were used for patients at the discretion of the surgeon.

All patients followed an institutionally-approved postoperative care pathway, including guidance for pain control and early ambulation beginning on postoperative day 1. This pathway was followed if no contraindications were present, such as clinical signs of bleeding and prolonged intubation or complications that may have affected the patient's recovery.

Demographic characteristics identified and reviewed for patients included age, race, body mass index (BMI), American society of anesthesiologist (ASA) score, surgical technique, and pathological stage as per the 2002 AJCC staging system. Clinical parameters analyzed included operative duration, estimated blood loss (EBL), length of stay (LOS), intraoperative and 30-day transfusion rates, as well as 90-day complication rates. Surgical complications were reported according to a previously published study on the modified Clavien classification system used by our institution.[10]

For univariable analyses, the Chi-square test was used for categorical variables and the Kruskal–Wallis test was used for continuous variables. Patient, disease, and operative characteristics were compared across patients receiving ACT, patients receiving no treatment, and patients on chronic aspirin. Surgical outcomes included operative duration, EBL, LOS, transfusion rates, number of packed red blood cells (pRBC) transfused, complication rates, and complication grade (1–2 vs 3–5) among those with a complication. We used multivariable linear and logistic regression models adjusting for age at surgery, BMI, ASA score, stage, and year of surgery to compare surgical outcomes between the ACT cohort, the no treatment cohort, and the chronic aspirin cohort. Additionally, among patients on chronic ACT, surgical outcomes were compared between those who underwent minimally invasive (MIS) vs open procedures and those who underwent radical nephrectomy (RN) vs partial nephrectomy (PN). MIS included both laproscopic and robot assisted surgery. All analyses were performed using SAS version 9.2 software (SAS Institute, Cary, NC).

Results

Patient demographics and tumor characteristics are found in Table 1. The median age of patients on ACT was significantly older at 68.4 years (IQR 61.2–74.3) compared to 57.3 years (IQR 48.8–66.1) for patients not on ACT and 63.9 (IQR 57.3–71.5) for patients on chronic aspirin use, $p < 0.001$. Patients in the ACT cohort had a higher proportion of ASA 3 and 4 scores compared to the no therapy and aspirin users (82.6% vs 42.4% vs 57.9, respectively, $p < 0.001$). We found no differences in pathological stage, the percentage of patients undergoing PN, and the percentage of patients undergoing MIS (Table 1).

The majority of our patients were prescribed either clopidogrel (97/172, 56.4%) or warfarin (67/172, 39.0%). Enoxaparin sodium (5/172, 2.9%) and tinzaparin sodium (3/172, 1.7%) were used by the remainder of the patients. Of the 172 patients on ACT, 54 (31.4%) had cardiac arrhythmias, 63 (36.6%) had a history of coronary artery disease or of myocardial infarction, 15 (8.7%) suffered from a cerebral vascular accident, 13 (7.6%) had a history of a deep venous thrombosis (DVT), 8 (4.7%) had a history of a hypervascular state, 9 (5.2%) had a history of a pulmonary embolus (PE), 7 (4.1%) were diagnosed with peripheral vascular disease, and 3 (1.7%) had a history of valvular disease or replacement. We identified no significant difference in EBL, transfusion rates, and median number of pRBC transfused or complications between the patients on chronic clopiogrel and those on chronic warfarin.

Intraoperative and postoperative characteristics by group are found in Table 2. Median LOS for the ACT cohort and for both the aspirin and no therapy cohorts was 3 days (IQR 3–4) and 3 days (IQR 2–4) respectively ($p < 0.001$). ACT