

Impact of Chronic Kidney Disease on Clinical Outcomes of Endovascular Treatment for Femoropopliteal Arterial Disease

Paul P. Heideman, MD, Mohammad Reza Rajebi, MD, Michael A. McKusick, MD, Haraldur Bjarnason, MD, Gustavo S. Oderich, MD, Jeremy L. Friese, MD, Mark D. Fleming, MD, Andrew H. Stockland, MD, William S. Harmsen, MS, Jay Mandrekar, PhD, and Sanjay Misra, MD

ABSTRACT

Purpose: To evaluate effect of chronic kidney disease (CKD) on all-cause mortality, major adverse limb event (MALE), MALE and postoperative death (MALE + POD), and amputation after endovascular treatment of femoropopliteal disease.

Materials and Methods: A retrospective review from January 2002 to October 2011 was performed of 440 patients who underwent endovascular treatment of symptomatic femoropopliteal disease for claudication (n = 251) or critical limb ischemia (CLI) (n = 267). CKD stage was divided based on Kidney Dialysis Outcomes Quality Initiative classification. Outcomes and factors associated with amputation, MALE, and MALE + POD were determined.

Results: Patients with diabetes (hazard ratio [HR] = 2.2; 95% confidence interval [CI], 1.3–3.6; *P* = .002) and runoff score of 0 or 1 (HR = 2.0; 95% CI, 1.2–3.4; *P* = .01) relative to runoff score of 3 were at increased risk of amputation. Patients with baseline glomerular filtration rate < 45 mL/min/1.73 m² had a 17% increase in amputation for every 5-point decrease < 45 mL/min/1.73 m² (95% CI, 1.09–1.26; *P* < .001). Increase of 10 years in age (HR = 1.9; 95% CI, 1.5–2.3; *P* < .001), TransAtlantic Inter-Society Consensus class of C/D relative to A/B (HR = 1.6; 95% CI, 1.1–2.2; *P* = .01), and CLI (HR = 2.4; 95% CI, 0.5–0.9; *P* < .001) were associated with increased mortality. Female sex was associated with decreased risk of mortality (HR = 0.7; 95% CI, 0.5–0.9; *P* = .01).

Conclusions: Worsening CKD is associated with higher amputation rates, all-cause mortality, and MALE + POD in patients undergoing endovascular treatment of femoropopliteal disease.

ABBREVIATIONS

ABI = ankle-brachial index, CI = confidence interval, CKD = chronic kidney disease, CLI = critical limb ischemia, GFR = glomerular filtration rate, HR = hazard ratio, MALE = major adverse limb event, MALE + POD = major adverse limb events and postoperative death, PAD = peripheral arterial disease, POBA = plain old balloon angioplasty, TASC = TransAtlantic Inter-Society Consensus

From the Division of Vascular and Interventional Radiology (P.P.H., M.R.R., M.A.M., H.B., J.L.F., A.H.S., S.M.), Department of Radiology, Division of Vascular and Endovascular Surgery (G.S.O., M.D.F.), Biomedical Statistics and Informatics (W.S.H., J.M.), and Vascular and Interventional Radiology Translational Laboratory (S.M.), Mayo Clinic, 200 First Street SW, Rochester, MN 55905. Received March 30, 2015; final revision received April 28, 2016; accepted April 30, 2016. Address correspondence to S.M.; E-mail: misra.sanjay@mayo.edu

From the SIR 2014 Annual Meeting.

J.L.F. receives personal fees from Covidien (Minneapolis, Minnesota). None of the other authors have identified a conflict of interest.

© SIR, 2016

J Vasc Interv Radiol 2016; XX:■■■-■■■

<http://dx.doi.org/10.1016/j.jvir.2016.04.036>

Peripheral arterial disease (PAD) is common; disease prevalence is 3%–10% in the United States and 15%–20% in individuals > 70 years old (1). Although noninvasive methods such as risk factor modification are initially recommended for patients with PAD, these patients are increasingly undergoing percutaneous angioplasty or stent implantation as a first-line invasive intervention. Percutaneous treatment has been established as a safe and effective alternative to surgical bypass that is also more cost-effective and less invasive (2–5). Patients also report improved quality of life after endovascular treatment (6). Although infrainguinal angioplasty and stent placement have been established as an appropriate treatment in many patients, some

questions remain unanswered. Individualized approaches to patients should encompass anatomic considerations, the type of endovascular treatment, and the effects of patient comorbidities on the potential success of the treatment.

Several studies have been conducted to investigate patient comorbidities and their relationship to patient outcomes. Bakken et al (7) showed that diabetes mellitus is a significant risk factor for amputation in patients undergoing superficial femoral artery angioplasty. An association between chronic kidney disease (CKD) and PAD has been established; however, limited data are available on the effect of CKD on outcomes of endovascular treatment of patients with superficial femoral artery disease in regard to all-cause mortality, amputation, major adverse limb events (MALE), and major adverse limb events and postoperative death (MALE + POD). In postmenopausal women, CKD has been shown to be an independent risk factor for future PAD (8,9). Additional evidence supports that patients on long-term hemodialysis have worse outcomes after primary angioplasty than patients who are not on hemodialysis (10–12). A more recent study showed increased rates of death and amputation in patients with critical limb ischemia (CLI) with severe (stage 4 or 5) CKD (13). The effect of moderate stages of CKD on patient outcomes after endovascular interventions is not well understood. The purpose of this study was to investigate the effect of different stages of CKD on amputation, all-cause mortality, MALE, MALE + POD, and restenosis in patients undergoing endovascular intervention for symptomatic femoropopliteal atherosclerotic disease.

MATERIALS AND METHODS

Institutional review board approval was obtained for this single-center retrospective study. This study analyzed 440 patients (58% male; age, 72.3 y \pm 10.7) with 518 femoropopliteal atherosclerotic limbs treated with either percutaneous angioplasty or stent placement between January 25, 2002, and October 10, 2011, for claudication or CLI. This group did not include patients who underwent concurrent procedures for inflow disease (eg, iliac stent placement), concurrent endarterectomy of the superficial femoral artery or popliteal arteries, or tibial artery treatment. The median duration of follow-up was 4.3 years (interquartile range, 1.4–4.8 y). Patient demographics and comorbidities are listed in Table 1. Table 2 lists patients with claudication and CLI according to CKD stage. For the purpose of this study, dissections that did not limit blood flow (n = 36), some of which were treated with stent placement, were not considered to be complications.

Endovascular Treatment

Endovascular treatment of the superficial femoral and popliteal arteries was performed as follows. Usually, the

Table 1. Patient Demographics

Characteristic	Value
Age, y, mean (SD)	72.3 (10.7)
Sex, n (%)	
Male	299 (58)
Female	219 (42)
Smoking status, n (%)	
Never	154 (30)
Former	254 (49.0)
Current	110 (21)
Chronic kidney disease, n (%)	
Yes	145 (28)
No	368 (72)
Diabetes, n (%)	
Yes	283 (55)
No	234 (45)
Coronary artery disease, n (%)	
Yes	325 (63)
No	193 (3)
Hypertension, n (%)	
Yes	456 (88)
No	62 (12)
Hyperlipidemia, n (%)	
Yes	405 (78)
No	112 (22)
KDOQI CKD stage, n (%)	
1	61 (12)
2	172 (33)
3A	141 (27)
3B	80 (16)
4	20 (4)
5	43 (8)

CKD = chronic kidney disease; KDOQI = Kidney Dialysis Outcomes Quality Initiative.

Table 2. CKD Stage in Patients with Claudication and CLI

CKD Stage	Claudication	CLI	P Value
1	25 (10)	36 (14)	< .001
2	110 (44)	62 (23)	
3A	76 (30)	65 (24)	
3B	32 (13)	48 (18)	
4	7 (3)	13 (5)	
5	0 (0)	43 (16)	
Missing	1	0	

Note—Values are presented as n (%).

CKD = chronic kidney disease; CLI = critical limb ischemia.

contralateral common femoral artery was punctured and a 6- to 8-F vascular sheath (Terumo Medical Corporation, Somerset, New Jersey) was placed. After obtaining a diagnostic pelvic angiogram, the contralateral femoral artery was selected, and a lower extremity diagnostic angiogram was obtained. The patient was given systemic heparinization using a bolus of 5,000 U of

Download English Version:

<https://daneshyari.com/en/article/4237122>

Download Persian Version:

<https://daneshyari.com/article/4237122>

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