

## PERIPHERAL AND AORTIC DISEASE: COMORBIDITIES AND OUTCOMES OF INTERVENTION

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### The impact of end-stage renal disease status on peripheral endovascular intervention outcome in patients with severe peripheral artery disease

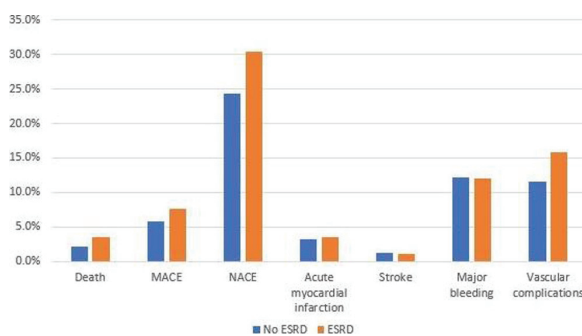
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**Background:** The impact of end-stage renal disease (ESRD) on peripheral endovascular intervention in patients with severe peripheral artery disease (PAD) is unknown.

**Purpose:** We sought to study the impact of ESRD on patients with PAD undergoing peripheral endovascular intervention (PEI) compared to those with normal kidney function.

**Method:** Using weighted data from the National Inpatient Sample (NIS) database between 2002 and 2014, we identified all patients who are  $\geq 18$  years of age and underwent PEI. International Classification of Diseases-Ninth Revision-Clinical Modification codes were used to identify all patients with ESRD. We excluded all patients who had chronic kidney disease (CKD) not requiring dialysis, leaving only those who have ESRD or normal kidney function. Multivariate logistic regression analysis was performed to examine in-hospital outcomes while adjusting for potential risk factors.

**Results:** Of 1,803,111 patients who underwent PEI within the study period, 1,446,746 had normal kidney function (80.2%), and 356,365 had ESRD (19.8%). Compared with patients who had normal kidney function, in-hospital mortality was significantly higher in patients with ESRD (3.6% vs 2.1%, adjusted OR: 1.346 [95% CI: 1.307–1.385]). Patients with ESRD also had higher incidence of myocardial infarction (MI) (3.6% vs 3.2%,  $p < 0.001$ ), vascular complications (15.9% vs 11.6%,  $p < 0.001$ ), MACE (composite of death, myocardial infarction, or stroke) (7.7% vs 5.8%,  $p < 0.001$ ) and NACE (composite of MACE, major bleeding, or vascular complications) (30.4% vs 24.4%,  $p < 0.001$ ) compared with no ESRD group. ESRD group had longer length of stay compared with patients with no ESRD (median 6 days; Interquartile range [IQR] (3–15) vs 3 days; IQR (3–12),  $p < 0.001$ ).



Incidence of adverse outcomes in patient

**Conclusion:** ESRD is associated with adverse outcome in patients undergoing PEI. These findings highlight the importance of periprocedural risk assessment and medical optimization for ESRD patients undergoing PEI.

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### Long-term clinical outcomes after lower limb revascularization in dialysis patients with peripheral artery disease

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**Background:** Regardless of surgical or percutaneous procedure, lower limb revascularization has been widely performed even in patients with chronic kidney disease, who are consistently at high risk of atherosclerosis, to treat peripheral artery disease (PAD). However, it remains controversial which procedure should be optimized in this unique population, particularly dialysis patients. We comparatively investigated long-term clinical outcomes after bypass surgery or endovascular therapy (EVT) in patients on chronic hemodialysis (HD).

**Methods:** We enrolled a total of 1366 consecutive HD patients electively undergoing lower limb revascularization. Of them, 392 patients underwent bypass surgery and 974 patients underwent EVT. They were followed up to 10 years. Primary endpoint was defined as major adverse cardiovascular events (MACE) including all-cause death, non-fatal myocardial infarction and stroke. Second endpoint was major adverse limb events (MALE) including any revascularization and major amputation. To reduce the selection bias between the procedures, propen-

sity score with all baseline characteristics was incorporated into Cox proportional hazards model as a covariate.

**Results:** Mean age and prevalence of diabetes were higher in the EVT group than in the bypass group (69 years vs. 67 years,  $p < 0.0001$  and 69.2% vs. 53.3%,  $p < 0.0001$ ), respectively. Inversely, critical limb ischemia and infra-popliteal disease were more frequent in the bypass group (77.5% vs. 43.1%,  $p < 0.0001$  and 46.9% vs. 23.2%,  $p < 0.0001$ ), respectively. During follow-up period (median 48 months), 470 MACE (34.4%) and 400 MALE (29.3%) occurred. Kaplan-Meier freedom rate from MACE and MALE for 10 years was higher in the bypass group than in the EVT group (45.3% vs. 37.9%,  $p = 0.062$  and 60.6% vs. 47.3%,  $p = 0.023$ ), respectively. Even after propensity score-adjustment, bypass surgery still had advantage for preventing MACE and MALE [46.9% vs. 38.2%, adjusted hazard ratio (HR) 0.70, 95% confidence interval (CI) 0.55–0.89,  $p = 0.0032$  and 67.2% vs. 43.1%, adjusted HR 0.55, 95% CI, 0.42–0.71,  $p < 0.0001$ ], respectively. The adjusted survival rate was broadly comparable between two group (47.4% in the bypass group and 53.7% in the EVT group, HR 1.18, 95% CI 0.91–1.53,  $p = 0.20$ ). Although the limb salvage rate was crudely lower in the bypass group than in the EVT group (81.6% vs. 87.6%, HR 2.20, 95% CI 1.48–3.26,  $p < 0.0001$ ), that is comparable after propensity score-adjustment (89.9% vs. 86.4%, HR 1.02, 95% CI 0.64–1.60,  $p = 0.94$ ). The freedom from any revascularization was consistently higher in the bypass group (67.2% vs. 43.1%, adjusted HR 0.49, 95% CI 0.36–0.66,  $p < 0.0001$ ).

**Conclusion:** Bypass surgery was superior to prevent MACE and MALE compared to EVT even after adjustment for difference of clinical characteristics in HD patients with PAD.

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### Effects of chronic kidney disease on clinical outcomes in patients with peripheral artery disease undergoing endovascular treatment: analysis from the K-VIS ELLA registry

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**Objectives:** Chronic kidney disease (CKD) is a risk factor for peripheral artery disease (PAD), but the impact of CKD in PAD patients who received endovascular treatment (EVT) is not well studied. Aim of this study is to clarify the impact of CKD in patients with PAD in real EVT era.

**Methods:** Using the Korean Vascular Intervention Society (K-VIS) endovascular therapy in lower limb artery disease registry (ELLA) registry, we analyzed 3,434 patients who underwent EVT. Baseline characteristics, in-hospital events, and overall- and major adverse limb events (MALE)-free survival were analyzed.

**Results:** 2,739 patients (3,548 target limbs) were included. 272 patients featured CKD (9.9%). Limbs in CKD patients had higher Rutherford scores, higher prevalence of critical limb ischemia (CLI). There were no differences in technical success rates in non-CKD v.s. CKD group comparison and non-severe CKD v.s. severe CKD group comparison. ( $p = 0.050$ ,  $0.581$ , respectively) In-hospital death ( $p < 0.001$ ) and short-term unexpected amputation ( $p = 0.028$ ) were more frequent in the CKD group. The short-term outcome differences between severe and non-severe CKD were insignificant. Kaplan-Meier curves favored overall and MALE-free survival in non-CKD patients compared with CKD patients, but there were no difference in overall- or MALE-free survival between non-severe CKD and severe CKD group.

**Conclusion:** PAD patients with CKD showed worse short-term mortality, short-term unexpected amputation outcome, and overall- and MALE-free survival than those without CKD in real EVT era. These findings might provide additive prognostic information for PAD patients with CKD who will be treated with EVT.

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### Moderate to severe renal insufficiency and risk for cardiovascular and limb outcomes in patients with symptomatic peripheral artery disease: the EUCLID trial

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**Background:** In patients with symptomatic peripheral artery disease (PAD), the