

# Outcomes of invasive treatment in Chronic Limb-Threatening Ischaemia

Akademisk avhandling

som för avläggande av medicine doktorsexamen vid Sahlgrenska akademien, Göteborgs universitet kommer att offentlig försvaras i Hörsal Arvid Carlsson, Academicum, Medicinaregatan 3, Göteborg, fredagen den 27 oktober, 2023 kl 09.00  
av

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## Avhandlingen baseras på följande delarbeten

- I. Perlander A, Jivegard L, Nordanstig J, Svensson M, Osterberg K.  
Amputation-free survival, limb symptom alleviation, and reintervention rates after open and endovascular revascularisation of femoropopliteal lesions in patients with chronic limb-threatening ischemia.  
J Vasc Surg. 2020; 72:1987-95.
- II. Perlander A, Osterberg K, Nordanstig J, Svensson M.  
Cost-Effectiveness Of Endovascular Intervention Versus Bypass Surgery in Patients With Chronic Limb-Threatening Ischemia and Principal Target Lesion in the Femoropopliteal Segment.  
J Crit Limb Ischem. 2022; 2:19-26.
- III. Perlander A, Broeren M, Osterberg K, Svensson M, Nordanstig J.  
Disease Specific Health Related Quality of Life in Patients With Chronic Limb Threatening Ischaemia Undergoing Revascularisation of Femoropopliteal Lesions.  
Eur J Vasc Endovasc Surg. 2023; 66: 245-251.
- IV. Perlander A, Svensson M, Osterberg K, Nordanstig J.  
Ten-year follow-up after lower limb revascularisation in patients with chronic limb-threatening ischaemia and main target lesions in the femoropopliteal segment.  
Manuscript.

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# Outcomes of invasive treatment in Chronic Limb-Threatening Ischaemia

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## Abstract

**Background** In chronic limb-threatening ischaemia (CLTI) obstruction of the arterial blood flow causes ischaemic rest pain, ulcers or gangrene in the lower extremities. Patients with CLTI have a substantial risk of amputation unless the blood flow is improved, which requires invasive treatment through either open surgery or endovascular intervention.

**Methods** This thesis aimed to analyse the outcomes of invasive CLTI treatments in terms of survival, major amputation rates, development of ischaemic symptoms, disease-specific health-related quality of life (HRQoL) and cost effectiveness. An observational study was conducted in 190 patients with CLTI whose main vessel lesion was located in the femoropopliteal artery. The patients underwent either bypass surgery or endovascular intervention according to existing treatment guidelines and were followed up prospectively.

**Results** The amputation-free survival (AFS) rates were 65% at 2 years, 41% at 5 years and 17% at 10 years after intervention. Survival and regression analyses showed worse AFS in patients who underwent endovascular intervention compared with those who underwent bypass surgery (adjusted hazard ratio 1.51). Most non-amputated survivors were free from CLTI symptoms at both 2 years (98/121) and 5 years (48/56) after intervention and reported substantially improved disease specific HRQoL, which remained relatively constant during follow-up (mean VasuQoL scores of 2.68 at baseline, 4.58 at 2 years and 4.63 at 5 years after intervention). The cumulative hospital cost at 2 years of follow-up was approximately twice as high in the bypass cohort as in the endovascular cohort (SEK 355 000 versus SEK 184 000), whereas the corresponding gain in quality adjusted life years (QALYs) was small (1.04 versus 0.95), resulting in a very high incremental cost-effectiveness ratio.

**Conclusions** In this study, patients with CLTI who underwent femoropopliteal revascularisation reported low baseline HRQoL levels, had a low average survival time and sustained a high risk of major limb amputation. However, those who remained alive with a preserved leg were to a large extent free from CLTI symptoms and reported enduring positive effects on disease specific HRQoL after revascularisation. Bypass surgery was associated with a favourable AFS compared with endovascular intervention, also after controlling for baseline intergroup differences, but the incremental cost-effectiveness ratio for bypass surgery was very high.

**Keywords:** chronic limb-threatening ischaemia, critical ischaemia, bypass surgery, endovascular intervention, amputation-free survival, health-related quality of life, cost effectiveness