

# Surgical site infections in vascular surgery

Citation for published version (APA):

Langenberg, J. C. M. (2021). *Surgical site infections in vascular surgery*. [Doctoral Thesis, Maastricht University]. Maastricht University. <https://doi.org/10.26481/dis.20210625jl>

## Document status and date:

Published: 01/01/2021

## DOI:

[10.26481/dis.20210625jl](https://doi.org/10.26481/dis.20210625jl)

## Document Version:

Publisher's PDF, also known as Version of record

## Please check the document version of this publication:

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# **Chapter 8**

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**Impact Paragraph**

The goal of this thesis was to describe the factors that influence post-operative complications after vascular surgery and to offer solutions where possible. Surgical site infection (SSI) is a major complication after vascular surgery and causes high morbidity and health costs. On the subject of preventing SSIs, this thesis offers various risk factors to guide clinicians and surgeons, as well as preventative measures to counter possible morbidity and mortality. This thesis presents various insights in vascular surgery and infection management that contribute to optimizing care for vascular surgery patients.

As described in the general discussion in this thesis, a huge worldwide problem is growing bacterial resistance to antimicrobial therapies. This thesis presents ideas to prevent SSIs in vascular surgery without contributing to the ever-growing antibiotic resistance. The eradication of *S. aureus* prior to certain vascular procedures reduces post-operative infections with a minimal risk to increasing bacterial resistance. Furthermore, the general discussion describes promising emerging methods of *S. aureus* eradication therapy that might be effective even in antibiotic resistant bacteria. The findings in this thesis have led to a change in perioperative care in the Amphia Hospital, Breda. Screening and eradication of *S. aureus* has become standard care prior to vascular surgery in groups that benefit from eradication therapy. To avoid contributing to bacterial resistance to mupirocin, the Amphia Hospital has reserved their screening and eradication regimen for patient groups that have been proven to benefit from it instead of treating every vascular patient with preventive antibiotic treatment.

Since antibiotic therapies seem to have a finite usability in the light of growing bacterial resistance, we tried to elaborate on our experimental research by searching for possible future methods of *S. aureus* eradication treatment.

Our research shows that SSIs can be just as common after endovascular surgery as after open vascular surgery. This finding should caution vascular surgeons to remain alert even after, usually deemed safer, endovascular therapy. We also found a strong correlation between SSI and the potential life-threatening infection of vascular grafts. Because of this finding, we postulated two questions for further research on this subject. Does long-term antibiotic use prevent graft infection after surgical site infection? Or could graft infection be diagnosed early by subjecting patients who developed SSI to frequent radiographic imaging?

Concerning patient safety and patient-friendly surgery, we analysed the infection risk between performing one or two operations in patients with arterial occlusive disease. It showed that a hybrid procedure combining open femoral endarterectomy with endovascular revascularization is a safe procedure without significant differences in infection rates. Also, hybrid revascularization is more cost-effective than two separate procedures and more patient-friendly due to the comfort of only having to undergo one surgical session, combined with shorter hospital stay.

The results of this thesis have been made public through publication in international scientific journals and by means of presentation on international symposia. Through discussion with doctors and scientists from over the world we have sought to add to the general knowledge on vascular surgery complications and reduce the risk of SSIs and graft infections with their associated morbidity and mortality for patients around the world.