Re: ‘The Benefit of Revascularization in Nonagenarians with Lower Limb Ischemia is Limited by High Mortality’

We read with great interest the article by Saarinen et al.1 The authors studied outcomes following endovascular versus open surgery for revascularization of acute and chronic lower limb ischemia in 90 to 100 year old patients. They found that endovascular management was not associated with any improvement in survival, limb salvage, or amputation free survival. The authors did not include the type of anesthesia in their prognostic analysis. Of note is that older age has been reported to be associated with a higher rate of post-operative complications in all types of surgery. This burden can be attributed to the presence of comorbidities, the lack of physiological reserve, and the impact of general anesthesia and post-operative immobilization on mental status.2 The latter is likely to be of considerable importance in the study by Saarinen et al.,1 as they found dementia to be an independent risk factor for poor amputation free survival. To avoid the negative impact of general anesthesia and post-operative immobilization on the mental status of elderly patients and the overall outcome following revascularization, current guidelines advocate the use of short acting anesthetic agents, local anesthesia, and early mobilization.3 Such guidelines should not limit the extent of revascularization but should clearly favor an endovascular over an open approach in elderly patients. We have even used local anesthesia and light sedation to perform a total endovascular repair of an acute aortic thrombosis in a 101 year old patient (Fig. 1). The surgical procedure

![Figure 1](image1.png)  
**Figure 1.** Computed tomography angiography reconstruction of aortic thrombosis (left, left iliac artery; right, right iliac artery).

![Figure 2](image2.png)  
**Figure 2.** Computed tomography angiography after revascularization (left, right iliac artery, right, left iliac artery).
included direct thrombus aspiration and aortoiliac stenting through bilateral femoral artery punctures, with a good radiological result (Fig. 2). More importantly, the local anesthesia and endovascular approach allowed the early mobilization of the patient, who was discharged on post-operative day 3, and remains well 2 years after surgery.

In all, we strongly believe that the type of anesthesia used should be taken into account when studying the outcome following revascularization in elderly patients, and that endovascular treatment under local anesthesia should be the procedure of choice in this setting.

REFERENCES


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“Re: The Benefit of Revascularization in Nonagenarians With Lower Limb Ischemia is Limited by High Mortality”

We would like to thank you for your interest in this article. The aim of our study was to find out the outcome of nonagenarians undergoing lower limb revascularization. The main finding was that overall survival of these very old patients was poor, but good limb salvage could be achieved by both endovascular and surgical revascularization. Furthermore, most patients preserved their functional status after revascularization. Dementia was an independent predictor of poor survival.

The authors of the letter underlined the importance of the type of anesthesia as a prognostic factor in elderly patients undergoing lower limb revascularization. In our study endovascular procedures were performed mainly under local anesthesia, with only few exceptions where light sedation was used. On the other hand, surgical revascularizations were performed under general or regional anesthesia, except for embolectomies, which were performed mainly under local anesthesia. Although there was no statistically significant difference in survival between endovascular and surgical groups, there was a trend towards better peri-operative survival in the endovascular group, which makes relevant the issue of type of anesthesia.

We agree that in this elderly, fragile patient group endovascular revascularization under local anesthesia should be first choice whenever feasible. If surgical revascularization is needed, anesthesia, whether regional or general, should be tailored taking patient risk factors (cardiac problems, cognitive impairment etc.) into consideration. When general anesthesia is necessary, depth of anesthesia is an important factor, as light general anesthesia appears to be associated with a lower complication rate in high risk patients according to a recent pilot study. At our institution we have a vascular anesthesiologist in our team so that the best anesthesia can be tailored for each patient.

Finally, we strongly agree that in the future, type of anesthesia should be taken into consideration when the outcome of infrainguinal revascularizations is studied, especially in high risk patients.

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