

Abdominal aortic aneurysm

Aspects on diagnosis and treatment

Akademisk avhandling

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Av

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Avhandlingen baseras på följande delarbeten

- I. Linné A., Smidfelt, K., Langenskiöld, M., Hultgren, R., Nordanstig, J., Kragsterman, B., Lindström, D.
Low Post-operative Mortality after Surgery on Patients with Screening-detected Abdominal Aortic Aneurysms: A Swedvasc Registry Study
Eur J Vasc Endovasc Surg (2014) 48, 649-656.
- II. Smidfelt, K., Drott, C., Törnngren, K., Nordanstig, J., Herlitz, J., Langenskiöld M.
The Impact of Initial Misdiagnosis of Ruptured Abdominal Aortic Aneurysms on Lead Times, Complication Rate, and Survival
Eur J Vasc Endovasc Surg (2017) 54, 21-27
- III. Smidfelt, K., Nordanstig, J., Wingren, U., Bergström, G., Langenskiöld, M.
Primarily open abdomen compared to primary closure of the abdomen in patients undergoing open repair for ruptured abdominal aortic aneurysms: a study of mortality and complications.
Submitted
- IV. Smidfelt, K., Nordanstig, J., Davidsson, A., Törnngren, K., Langenskiöld, M.
Misdiagnosis of ruptured abdominal aortic aneurysms is common and is associated with increased mortality
Submitted

**SAHLGRENKA AKADEMIN
INSTITUTIONEN FÖR MEDICIN**



Abdominal Aortic Aneurysm - Aspects on diagnosis and treatment

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Abstract

Background:

An abdominal aortic aneurysm (AAA) is an abnormal widening of the aorta with a risk of rupture if it grows to a large diameter. Rupture is associated with massive bleeding and a poor prognosis for survival.

Aims:

The aim of this thesis was to evaluate the results of surgical intervention in patients with AAAs detected by population-based screening, including comparisons with the results in patients with aneurysms that were not detected by screening. A further aim was to investigate how common misdiagnosis is in the emergency department in patients seeking care for a ruptured AAA (rAAA), and how misdiagnosis affects the prognosis. A third aim was to investigate whether it is beneficial to treat patients with a primary open abdomen with delayed closure after open repair for AAA.

Methods:

Patients with AAA were identified in the Swedish Vascular Registry (Studies 1–4) and the Swedish Cause of Death Registry (Study 4). Additional information was obtained through review of medical charts (Studies 2–4). In Study 1, mortality, complications, and method of surgical intervention were compared in patients with AAAs detected by screening and in age-matched controls with AAAs that were not detected by screening. In Study 2 and Study 4, the outcome in patients with a ruptured abdominal aortic aneurysm (rAAA) who were misdiagnosed at the first assessment in the emergency department was compared to the outcome in patients who were correctly diagnosed initially. Study 2 included patients who reached surgery and Study 4 included all patients with rAAA, whether or not they reached surgery. In Study 3, mortality and complications in patients treated with a primary open abdomen after open repair for rAAA were compared to a propensity score-matched control group in which the majority of patients had the abdomen closed at the end of the procedure.

Results:

In Study 1, a higher proportion of the screening-detected patients were treated with open repair (56% vs. 45% in those with AAAs not detected by screening). The mortality 30 days, 90 days, and 1 year after open repair was similar in patients with screening detected and non screening- detected aneurysms. Mortality at 30 days and 1 year after Endovascular Aortic Repair (EVAR) was similar in both groups. Mortality at 90 days after EVAR was lower in the screening-detected compared to the non screening-detected patients (0% vs. 3.1%; $p = 0.04$). The overall 30-day mortality (including patients treated with either open repair or EVAR) was 0.6% in screening-detected patients and 1.4% in non screening-detected patients. ($p = 0.45$). The adjusted odds ratio for the primary endpoint (mortality or major complication at 30 days) was 1.64 (95% CI 0.82–3.25) in non screening-detected patients. Studies 2 and 4: Misdiagnosis was common and occurred in more than one-third of the patients with rAAA. Overall, the mortality was 74.6% in misdiagnosed patients and 62.9% in correctly diagnosed patients ($p = 0.01$). The adjusted odds ratio for mortality in the whole cohort of misdiagnosed patients was 1.83 (1.13–2.96). In patients who reached surgery, there was no significant difference in mortality between misdiagnosed patients and correctly diagnosed patients. Study 3: There were no significant differences in mortality or major complications between patients treated with a primary open abdomen with delayed closure and patients treated with primary closure of the abdomen.

Conclusion: The contemporary mortality after AAA surgery in Sweden was low irrespective of whether or not screening was used for detection. Patients with AAAs detected by screening had the same comorbidities and outcome as those with non screening-detected aneurysms, except for 90-day mortality after EVAR, which was lower in the screening group. Misdiagnosis is common in patients who seek care for a rAAA, and misdiagnosis is associated with a substantially higher risk of dying from the ruptured aneurysm. No survival advantage and no lower frequency of complications was observed in patients treated with a primary open abdomen and delayed closure after open repair for rAAA as compared to a propensity score-matched control group where the majority of patients were treated with primary closure of the abdomen.

Keywords:

Abdominal Aortic Aneurysm, Screening, EVAR, AAA, Mortality, AAA, rAAA, Misdiagnosis, Mortality, ruptured Abdominal Aortic Aneurysm, open abdomen, open repair, abdominal compartment syndrome, vacuum-assisted closure

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