Editorial

Abdominal Aortic Aneurysm

Treatment Choice and Volume Effects

Martin Czerny, Friedhelm Beyersdorf

Editorial to the articles:

"Endovascular and Open Repair of Abdominal Aortic Aneurysm"by Thomas Schmitz-Rixen et al.

and

"The Effects of Minimum Caseload Requirements on Management and Outcome in Abdominal Aortic Aneurysm Repair" by Matthias Trenner et al.

in this issue of Deutsches Ärzteblatt International

Department of Cardiovascular Surgery, University Heart Center Freiburg – Bad Krozingen and Medical Faculty, Albert Ludwigs University, Freiburg, Germany: Prof. Dr. med. Martin Czerny, Prof. Dr. med. Friedhelm Beyersdorf

Abdominal aortic aneurysm (AAA) is one of the most common vascular diseases. In this issue of the Deutsche Ärzteblatt, two articles are dedicated to the currently most pressing aspects of AAA. Special attention is paid, on the one hand, to the surgical treatment approach – comparing endovascular repair and open repair (1) – and, on the other hand, to the controversial topic of minimum caseload requirements (2).

Surgical management options

While the screening, diagnosis, therapy and follow-up of abdominal aortic aneurysm were published in a 2018 clinical practice (S3) guideline of the Association of the Scientific Medical Societies in Germany – under the leadership of the German Society for Vascular Surgery and Vascular Medicine (DGG) – (3), the special value of the article of Schmitz-Rixen and coauthors (1) lies in the description of the currently available surgical management options.

As with almost all medical treatments, we have to weigh the risk and benefits and choose the treatment best suited to the specific indication: infrarenal versus juxtarenal, pararenal or suprarenal AAA versus ruptured AAA. Currently, about 80% of all patients with AAA are treated with endovascular aortic repair (EVAR). Compared to open aneurysm repair (OAR), the 30-day mortality of EVAR is significantly lower (1.2% versus 3.3%). However, long-term imaging surveillance is essential in EVAR patients due to the risks of endoleaks and enlargement of the aneurysmal sac. Both these conditions may require re-intervention. In addition, preliminary evidence suggests that EVAR may be associated with a slightly increased risk of abdominal tumor disease (4).

Furthermore, gender differences in post-EVAR outcomes have to be taken into account. Both 30-day mortality and complication rates are significantly, albeit moderately (odds ratios between 1.2 and 1.9), increased in women compared to men, while long-term survival is reduced in female patients (5).

Anticipative management strategy

The long-term success of EVAR is dependent on anatomical prerequisites, such as the required distance to the renal arteries. Besides a potentially too short landing zone, further potentially adverse anatomical factors, such as the angulation of the pelvic vessels and the patency situation of lumbar vessels or the inferior mesenteric artery, have to be considered in the process of decision making and treatment planning.

As with many other situations, making any compromises is associated with less favorable outcomes and in numerous cases corrective catheter interventions or ultimately open surgery are required later in the course. In our experience, an anticipative management strategy can prevent these trade-off situations and achieve long-term success. As the overall condition of the patients is a key factor, we cannot overstate the importance of a comprehensive perioperative cardiovascular work-up.

Special challenges

Complex abdominal aortic aneurysms, such as juxtarenal, perirenal or suprarenal as well as penetrating or ruptured aneurysms, represent a particular technical challenge. In these special cases, too, studies have been conducted to evaluate the selection of the surgical technique and the outcomes achieved (6) and, above all, hospital mortality in relation to the hospital's absolute caseload. Here, hospitals with high procedure numbers for both EVAR and OAR performed better compared to hospitals with lower caseloads.

Nevertheless, the situation is more complex than it seems at first sight as outcomes are influenced by multiple factors, such as, for example,

- Advanced training in EVAR and OAR
- Accessibility of the hospital
- Complexity of the cases
- Consideration of minimum caseload requirements for AAA treatment as a characteristic of the hospital or surgeon.

For this reason, no binding minimum caseload requirements for elective AAA repairs have yet been established in Germany

Caseload requirements

Trenner and coauthors have used a very innovative approach to explore the controversial topic of minimum caseload requirements in abdominal aortic aneurysm (2). Methodologically, their analysis is based on the German diagnosis-related groups (DRG) statistics data of the years 2012 to 2016 (ICD-10 GM I71.3/4) with procedure codes for endovascular and open surgical procedures. The authors found a statistically significant association between high annual caseloads and low hospital mortality. Taking an approach that extends

beyond previous studies, they have modelled a useful parameter for the maximum distance between patient residential location and hospital location. Based on their results, they recommend a minimum caseload requirement of annually 30 AAA repairs. This would mean that 17 of 20 patients would not require transport distances of more than 100 km. In contrast, Nimptsch and Mansky (7) still recommended a minimum caseload requirement of 18 AAA cases per year based on their analysis of data of more than 22 000 patients treated with elective open surgery.

As already mentioned above, defining minimum caseload requirements for AAA repairs is a complex and multifaceted exercise. On the one hand, most studies demonstrate a clear correlation between hospital caseload volume and in-hospital mortality. On the other hand, however, the goal is to ensure that a sufficient number of experienced surgeons is always available to treat elective, complex and ruptured AAAs so that optimum outcomes can be achieved even in special cases. This approach would support the establishment of aortic centers with still wider-ranging requirements. Currently, we are already facing the problem of having to transport patients over long distances, as it is frequently not possible to ensure the availability of sufficient nursing staff or intensive care spaces at all hospital locations at all times. At the same time, there are medium-sized hospitals with highly trained vascular surgeons that are well capable of managing a certain volume of AAA cases.

Conclusion

The trend towards increased concentration of hospitals and interventions will certainly continue in the future, not least for cost reasons, lack of nursing and medical staff as well as advanced training intentions. We hope and expect that the concentration of hospitals and procedures and advancements in surgical techniques—from maximally invasive operative procedures in special cases to minimally invasive, endoscopic or robot-assisted procedures—will eventually lead to improved outcomes for patients.

Conflict of interest
The authors declare no conflict of interest.

Translated from the original German by Ralf Thöne, MD.

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Corresponding author
Prof. med. Dr. Martin Czerny
Klinik für Herz- und Gefäßchirurgie
Universitäts-Herzzentrum Freiburg – Bad Krozingen
Hugstetter Straße 55, 79106 Freiburg, Germany
martin.czerny@universitaets-herzzentrum.de

Cite this as:
Czerny M, Beyersdorf F: Abdominal aortic aneurysm—treatment choice and volume effects. Dtsch Arztebl Int 2020; 117: 811–2.
DOI: 10.3238/arztebl.2020.0811