Sedation outside the operation room
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TRANSFEMORAL AORTIC VALVE REPLACEMENT: DOES ANAESTHESIA MAKE THE DIFFERENCE?

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Transcatheter aortic valve implantation (TAVI) have been introduced and further developed as a last therapeutic option in patients with severe aortic stenosis, who are – because of severe comorbidity – not suitable for open-heart operations. Different approaches for aortic valve implantation are nowadays routinely performed: transapical, transaortic, and transfemoral placement of the aortic valve.\(^1\)

Transapical and transaortic (via direct aortotomie or via the arteria subclavia/axillaris) TAVI is routinely performed under general anaesthesia, transfemoral (TF-) TAVI can be done under either general (GA) or local anaesthesia (LA).\(^1-5\) The latter is most often combined with additional sedation.

While there is still debate on beneficial long-term effects of TAVI compared with classical aortic valve replacement,\(^6\) an additional question arises whether the type of anaesthesia provided for these procedures makes a difference for patient outcome.

The latter question can be further divided into two parts: first, does the individual anaesthetist make a difference to patient outcome, and second, does the type of anaesthesia play a role? A recent publication\(^7\) reports an increased mortality by nearly 50% in patients undergoing coronary artery bypass graft surgery served by “low-performance anaesthetists”. One might look for shortcomings of this publication, and we might feel uncomfortable with the mentioned statement, but several published comments also point out, what we all know: the individual anaesthetist makes a difference,\(^8,9\) and this will most likely also be the case in TF-TAVI procedures!

But does the type of anaesthesia also make a difference in patients undergoing TF-TAVI? There are supporters and opponents for GA or LA, as are advantages and disadvantages for either of the two options.\(^13\) Looking at the available evidence-based data, we have to agree that we cannot answer the question at this moment. There are no randomised controlled trials but only retrospective analyses or prospective observational registries. While some of these publications state that there is lower incidence of complications and better outcome when performing TF-TAVI under local anaesthesia,\(^5\) one has to take into account that retrospective and prospective observational studies have a significant reporting bias. In most of these registries, GA was used while the innovative technique of TF-TAVI was implemented; in contrast, use of LA increased over time during later years after gaining more experience with the technique.\(^10\) If this holds true, how can we then compare these two options on an evidence-based level with the respective data, and is it justified to perform a meta-analysis over the available results?\(^4\)

In the current issue of the British Journal of Anaesthesia, Mayr and colleagues\(^11\) present results of the first randomised study comparing sedation vs. GA for TF-TAVI. They analysed 62 patients randomised to either GA or sedation with propofol and remifentanil. Noteworthy, there was already experience with more than 600 TAVI procedures performed before in the respective investigational centre, most likely omitting the effects of the learning
curves.\textsuperscript{12} Two experienced cardiac anaesthetists were assigned to the procedures, with one only responsible for the study documentation. As the primary end-point the authors have chosen a surrogate parameter, probably reflecting one aspect of patient outcome: perioperative cumulative cerebral oxygen desaturation, which was comparable between groups, as were the results of the secondary endpoint, the neurocognitive function. However, more respiratory adverse events were registered in the sedation group. Looking in more detail at the anaesthetic procedure, the author’s state that moderate to deep sedation was performed to provide optimal implantation conditions. One might question whether we still can expect a favourable difference in patient outcome between general anaesthesia and deep sedation? Deep sedation for sure has several disadvantages, as are described in the respective adverse respiratory events of the present study. But is deep sedation really needed to facilitate this procedure in an optimal manner? In our centre, TF-TAVI is performed with reasonable results in unsedated or only light sedated patients.\textsuperscript{13} However, these results might also have significant bias, as they come from an observational cohort database and not from a randomised trial. As in other hospitals, we performed GA in the beginning and then switched to sedation and later to LA only, after learning our lessons concerning patient selection, vascular screening, team training, and after gaining more experienced with the procedure. However, although the TAVI procedures are constantly improved, all these interventions are associated with potentially life-threatening complications, and therefore - although the procedure is performed by a cardiologist under local analgesia – a cardiac anaesthetist is part of the multidisciplinary team. Performing TF-TAVI under LA without sedation has another advantage: communication with the patient is the best neurologic monitor we have, and in case of any cerebrovascular event, immediate further diagnostic and possible treatment strategies can be initiated. This advantage will be lost in situations where deep sedation is used, as described in the study by Mayr and colleagues.\textsuperscript{11} These authors have chosen cerebral desaturation as the primary outcome parameter; in both groups, cerebral oxygenation decreased during pacing-induced cardiac arrest for balloon valvuloplasty and hypotension during valve release. However, these periods of cerebral desaturation were obviously too short to have any effect on neurocognitive function. The current study is too small to allow a more distinct answer on whether the respective anaesthetic technique influences patient outcome after TF-TAVI. As most of the current reviews on this topic conclude, we need randomised trials to define the role of anaesthesia in the treatment of patients with severe aortic stenosis undergoing TF-TAVI. As the number of patients treated with this technique increases,\textsuperscript{14,15} we should be able to answer this question with evidence-based data from randomised trials. The study from Mayr and colleagues\textsuperscript{11} is a first step on a long way to further evaluate the optimal treatment strategies for TF-TAVI. It is attractive for cardiologists and cardiac surgeons to demonstrate that these procedures can be performed without anaesthesia support. Therefore, we clearly
have to define our role within the multidisciplinary teams treating patients with TF-TAVI – and it might not be enough to state that LA is insufficient in a given number of patients. We, as anaesthetists have the chance to demonstrate on a more evidence-based level that anaesthesia – beside the anaesthetic technique chosen - indeed makes a difference!
REFERENCES

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