Introduction

In our centre, transcatheter aortic valve implantation (TAVI) is performed under general anaesthesia, as is preferred by most other teams in Europe.¹ The British National Institute for Clinical Excellence (NICE) advises that only experienced cardiac anaesthesiologists should be involved in these procedures.² A cardiac anaesthesiologist must be involved in the selection, administration of anaesthesia and postoperative care of these patients.²

Role of the anaesthesiologist in TAVI

Anaesthesiologists are accustomed to working as part of a team consisting of many different disciplines. Anybody who does not function well in such a team, and who does not respect the transactive memory and safety of teamwork, should not be involved in these procedures.³

The role of the anaesthesiologist in the patient selection process and pre-operative assessment is not that of a gatekeeper. These procedures are not truly elective. They may be the last option, other than death, for these patients.

It is, however, the role of the anaesthesiologist to:

- Identify risk factors and discuss these risk factors, and their possible impact, with the team and the patient and family;
- Devise and plan strategies to make the procedure as safe as possible;
- Facilitate transoesophageal echocardiography in patients often very uncomfortable lying flat on their backs;
- Facilitate independent invasive monitoring;
- Facilitate rapid or slow pacing, with temporary cardiac output loss and loss of consciousness, with a protected airway.⁶

In this indication, local Anaesthesia and sedation is not safer than general anaesthesia.² ⁴ ⁵ It is the experience of most of the teams that have good outcomes that general anaesthesia contributes to these results. Teams that use local anaesthesia exclusively seem to achieve worse outcomes.¹ ⁴ ⁵

The general anaesthesia technique that is utilised in our centre is based on a combination of short-acting drugs that are selected to be independent of impaired organ elimination.

Small target-sensitive dosages of propofol combined with midazolam are used for induction:

- Propofol 500-600 µg/kg = target of 2.5 µg/ml;
- Midazolam < 20µg/kg

The maintenance of anaesthesia is achieved with a combination of an inhalational agent (sevoflurane), an opioid analgesic infusion (remifentanil), and a muscle relaxant (rocuronium or, in patients with renal impairment, atracurium). In fact, in the hands of a cardiac anaesthesiologist who is comfortable with it, any cardiovascularly stable, short-acting anaesthetic technique will be effective.

Patients should be invasively monitored, and the intravascular lines and infusions utilised must be identical to those for open cardiac operations. This must include bispectral index monitoring of depth of anaesthesia, with electromyography, to prevent overanaesthetising the patients.

The aim of the anaesthetic is to keep the patient as stable as possible, and to maintain homeostasis. Haemodynamic instability must be treated immediately according to cause, and not just reflexively.

A sound knowledge of the procedure and the expected haemodynamic effects is essential, so that the anaesthesiologist can pre-empt and, where appropriate, tolerate haemodynamic and ECG changes. Inappropriate corrections and actions can potentially do more than good.
Constant communication with the rest of the team is essential.

Profound knowledge and experience of echocardiography is essential, so that the anaesthesiologist can follow the progress of the procedure and take part in the decision-making process.

Postoperative care

After the procedure, patients should be woken up in the catheterisation room. We talk to them and make sure they are completely awake and self-supporting, from a ventilation point of view. The whole point of the procedure is lost if the patient is kept sedated and ventilated postoperatively.

Patients are then transferred, for initial, experienced high dependency care for at least 2 hours, before being stepped down to monitored ward beds.

Bleeding and haematoma formation from cannulation sites, and arrhythmias are main the main complications for which the patients are monitored. Standard cardiac surgical postoperative investigations must also be completed before discharge from the unit.

Conclusion

As these are innovative procedures, the anaesthetic experience is limited, but growing. The most successful teams have maintained their members as far as possible, in order to gain the most experience in the shortest time. The anaesthetic is still the safest part of TAVI, if administered with care by experienced personnel.

References


