

Patient Safety in Cardiothoracic Surgery: Enlightenment in the Tunnel of Danger

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Letter to the Editor

Dear Sir

With great interest we read the original research paper by Shashank Shekhar *et al.* J Am Heart Assoc. 2024; 13:e034298. DOI: 10.1161/JAHA.124.034298. The conclusion that Cerebral Protection Devices (CPD) used during transcatheter aortic valve replacement is not independently associated with a lower risk of overall stroke has not surprised us at all. Cardiothoracic surgeons and interventional cardiologists tend to underestimate the importance of specific information of the condition of the aorta and its carotid branches in relation with their contribution to cause serious cerebral events. Their focus is mainly targeted on cardiac repair and not necessarily on improving the outcome with regard to safety of the procedure. The industry has provided us with devices that helped us a lot further in the field and we are thankful for that. Many devices were developed with the help of a surgeon or even invented by a surgeon. A CPD may catch loosened particles or debris from the vessel wall or valve during the intervention. This short period of ‘cerebral protection’ disregards the potential risk due to damage at the time of inserting or placement of a device or cannula at different entry-sites of the vascular system. It thus sprinkles sand in the eyes of interventional team members: they think ‘the CPD will help me and my patients’. This is, to our opinion, a systemic error. We advocate using a multidisciplinary approach to anticipate on ‘hidden dangers’ in the main vascular tunnel and its cerebral branches to evaluate potential lethal embolic debris before even thinking of inserting or placement. First of all, we have to agree that there may be hidden dangers present, and secondly, we need to speak out loud: yes, we cannot close our eyes anymore for these findings and we need to do something with this information. Frequently used arguments of soloistic operating cardiothoracic surgeons (sometimes seeing

themselves still as ‘heroes’) like: ‘I never see post-operative complications, I don’t have the time to wait for extra information in the OR before a procedure, in my hands surgery is safe, and I have excellent results, and death and cerebral events are linked to and therefore normal in cardiac surgery, so what’s the deal?’, cannot be accepted now a days for the sake of our patients health. These quotes (derived from reality) may be counted more to the magnitude of their ego than of a true and honest sense of realism. Especially because there is an alternative method at hand to improve the safety strategy of the procedure.

One may ask ‘why is this new and easy method not immediately embraced by the surgical and interventional communities. For that answer we must enter the field of psychology: people (physicians included) don’t like to change their habits or routines. Even if it means that others (patients) will suffer from the consequences. Morbidity and mortality are looked at as being ‘normal’ in the game of cardiothoracic surgery where the patient is the one with the disease. These consequences can be major like debilitating stroke or death, or very subtle (due to detached very small embolic particles) like loss of concentration (‘I can’t remember as I used to and had to quit my job’) or permanent change of character: ‘I don’t recognize my husband anymore’.

Without any doubt significant improvements have been made in the rates of morbidity and mortality of cardiac interventions over the last decades. The issue now is ‘have they been realized in a safe environment or are they primarily due to better technical skills of the team members and materials?’ The talent of incorporating change in your practice may mean swiftly adapting new and safe techniques after they have demonstrated their benefit and are introduced to the market. However, the inertia of the medical area has shown that it lasts about twenty years from the development of a device to acceptance in daily practice. And of course, we need to be very cautious because the lives of our patients are in our hands. Nevertheless, many devices are accepted for daily practice not because there was overwhelming scientific evidence of their benefit to the patient. Many facets contribute to an eventual success of a device or method (e.g. industry driven interest, risky investments, and the ‘what’s in it for me’ vision of the end-user). However, the main reason is: can we (as medical doctors) or are we willing to change our procedures and routines for the benefit of our patients. To be honest, not every surgeon sees the light and has the talent to change, simply because they lack the capacity or have not encountered an inspiring role model during their training. One of my most inspiring role models in the safety of cardiac surgery is the cardiothoracic anesthesiologist Dr. Arno Nierich, inventor of the hereafter described device. His longstanding, tireless efforts to improve the concept of safety in the cardiac operating room deserve my great respect. I fully agree with his statement that if change cannot be incorporated in our daily practice, we will inevitably keep on ‘surprising’ ourselves by encountering the borders or limits of our results, every time again to the great disappoint of our patients.

To come back to the intra-vascular CPDs. It is to our continuing surprise that these protection devices are inserted without adequate, real-time information of the specific site of positioning. Static, no real-time information of CT-scans alone is not sufficient for this delicate purpose. Therefore, inserting CPD’s without TEE-A-View monitoring first will continue to sprinkle sand in our eyes. To open our eyes, we have advocated for years the use of a safe and 2-minute visualization technique: TEE-guided endotracheal A-View Balloon catheter [1,2]. This innovative diagnostic device has shown its added diagnostic value in imaging the distal aortic arch (an area formerly known as ‘the blind spot’ because it cannot be visualized by regular TEE without the A-View balloon) and its branch vessels

and has shown its clinical benefit. This investigation can be executed before opening the chest or before any manipulation of the ascending aorta in open-heart surgery or before insertion and placement of a CPD in cerebral vessels. This to ascertain the condition and thus offering the surgeon crucial information to alter the surgical strategy and minimalizing the risk of stroke [3,4]. The A-View diagnostic approach enlightens the 'blind spot' area. Furthermore, it is of great importance that the involved medical specialists (i.e. TEE-performing cardiac anesthesiologist and cardiac interventionalist/surgeon) must be convinced of the importance of the method, based on the principle and scientific evidence provided. They need to take their responsibility as leaders in the OR and propagate that the concept of safety in cardiac surgery is more than a successful operation. Of course, there are other causes for cerebral damage in cardiac interventions that need to be addressed as well. But with regard to our daily target: the aorta, surgeons can demonstrate that communicating about the real-time TEE-findings of the cardiac and vessel condition and subsequently map out the safest route for the procedure is of the utmost importance [5]. Without applying the easy A-View balloon technique patients will keep on encountering unnecessary cerebral or worse events.

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Citation of this Article

Brandon Bravo Bruinsma GJ. Patient Safety in Cardiothoracic Surgery: Enlightenment in the Tunnel of Danger. Mega J Case Rep. 2024;7(9):2001-2003.

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