

IS A PATIENT'S COGNITIVE STATE AFFECTED BY THE NUMBER OF EMBOLI ? TRANSCATHETER AORTIC VALVE IMPLANTATION VS AORTIC VALVE REPLACEMENT

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BACKGROUND

Neurological complications and neurocognitive impairment due to cerebral emboli are common complications following heart surgery.

OBJECTIVE

This study aimed to (i) compare the number of emboli detected in the middle cerebral artery (MCA) in three procedures: open aortic valve replacement (AVR), apical and femoral transcatheter aortic valve replacement (TAVR); and (ii) test whether or not an association between the number of emboli captured in each procedure and the changes in the patients' cognitive state exist.

METHODS

Forty-four patients were enrolled in the study, 36 of whom were incorporated in the final analyses. Fourteen patients underwent open-AVR, twelve underwent TAVR-femoral and ten underwent TAVR–apical. The number of emboli was detected by an MCA intraoperative transcranial Doppler ultrasound (TCD). All patients underwent neurocognitive evaluations by a Mini Mental Test the day before surgery and 6-12 weeks after surgery. The differences in Mini Mental (Δ MM) were tested for association with the number of emboli detected during the procedure. The number of emboli in the various surgeries and the MMSE scores are described by medians and percentiles (25th and 75th), according to an abnormal distribution.

RESULTS

Open-AVR resulted in a significantly greater number of emboli, median 8555 [2999, 12489] compared to both the apical 1962 [521, 3850] and femoral 1220 [948, 1946] TAVI approaches ($P=0.003$). Both TAVI approaches yielded a comparable amount of emboli ($P=0.798$). There was no association between mean number of emboli and the cognitive test results ($r=0.026$; $P=0.907$).

CONCLUSION

These findings suggest that compared to TAVR, more cerebral emboli are detected during AVR procedures; however, a greater number of emboli does not appear to adversely affect a patient's cognitive state as assessed by the Mini Mental test. The large number of emboli that were detected during the AVR procedure was due to numerous gas bubbles, which the TCD was unable to distinguish from solid emboli.