Commentary: Complex Valve Endocarditis: The Importance of Early Surgical Timing with Cerebral Emboli and a Multi-Disciplinary Endocarditis Team

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Central Message: Early operation and improvement in outcomes for complex valve endocarditis emphasize the importance of preoperative imaging and the heart valve team.

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Complex valve surgery for infective endocarditis remains a high-risk endeavor in the modern era. Despite patient optimization, advances in medical and surgical care, and our ability to salvage patients with mechanical support, the morbidity and mortality remains high. There remain many controversies in the management of these acutely ill patients and variation in treatment patterns across institutional centers, and the optimal timing for surgery in high risk patients with neurologic complications sits at the forefront. In this large series evaluating outcomes for high risk patients undergoing double valve surgery for infective endocarditis in the modern era, Miller and colleagues establish an aggressive early operative strategy for the management of these patients, with excellent overall outcomes (1). In their high-risk patient cohort undergoing predominantly urgent double valve operations, 10% had positive blood cultures on the day of operation, 43% had positive intraoperative cultures, and 20% of patients required mechanical circulatory support with ECMO and/or IABP device postoperatively. This aggressive approach yielded a surgical 30-day mortality of 15%, which although not insignificant, is impressive in this high-risk patient population.

Neurologic complications from infectious endocarditis occur in 20-40% of patients, however recent studies have shown that postoperative neurologic deterioration is low (1-3). AHA/ACC guidelines are vague when recommending surgical timing for patients with preoperative cerebral emboli. Early surgery is recommended for patients with recurrent emboli, persistent infection, valve destruction, and heart failure. It is “reasonable” to temporarily
discontinue anticoagulation for patients with cerebral emboli (class 2a), however patients with preoperative stroke without intracranial hemorrhage or extensive neurological damage may be considered for “operation without delay” (class 2b) (4). We need more concrete imaging and operative protocols for patients with preoperative cerebral emboli for earlier surgical clearance.

Postoperative stroke was not significantly associated with preoperative cerebral emboli (p=0.72). The median time between cerebral embolism and surgery was 8 days. Postoperative stroke occurred in 7% of patients with cerebral emboli and 9% of patients without known emboli. Of the 42 patients (20%) that presented with recent embolic stroke in the setting of endocarditis, 20 (48%) underwent preoperative cerebral angiogram to evaluate for mycotic aneurysm, and 2 patients (1% overall) underwent preoperative resection of the aneurysm before valve operation. A postoperative stroke rate of 7-9% remains high for all cardiac surgery operations, and 20% of double valve endocarditis patients presented with recent embolic stroke. Less than half of the patients with cerebral emboli (9.4% overall) underwent cerebral angiogram. These findings argue for preoperative comprehensive neuro imaging in all patients with left sided endocarditis, as one would suspect that many of the patients who suffered from postoperative stroke had preoperative silent micro-emboli or mycotic aneurysms that were not captured. In our institutional multi-disciplinary endocarditis neuro protocol, all patients with left sided valve endocarditis undergo head CT. If positive for emboli, petechial hemorrhage, and/or stroke, they undergo MRI, CTA, and formal cerebral angiogram preoperatively. While routine brain MRI may detect subclinical cerebral complications in up to 80% of patients, CT cerebral angiography has identified small intracranial mycotic aneurysms in more than 30% of patients with left sided endocarditis (5). Surgical mortality for patients with intra-cranial septic mycotic aneurysm approaches 60-80% to due bleeding and rupture risk (3,5). In the subset of patients
who have existing mycotic aneurysms and/or bleed, surgery is postponed until treatment by neurosurgery is determined and/or they have tolerated intravenous heparin trial with stability of CT scans. Therefore, MRI and cerebral angiography help to identify patients who require intervention for mycotic aneurysms preoperatively, establish timing for surgery, and minimize risk of postoperative catastrophic stroke and/or intracranial bleed.

References
