

EDITORIAL

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Infective endocarditis: Refer for expert team care as soon as possible

IN THIS ISSUE OF the *Journal*, Soud et al discuss the timing of referral of patients with infective endocarditis to surgery.¹ When having this discussion, it is important to understand the nature of the disease and the role of surgery in its treatment.

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Unless successfully treated and cured, infective endocarditis is fatal. It is associated with septic embolism (systemic with left-sided infective endocarditis and pulmonary with right-sided infective endocarditis), destruction of valve tissue, and invasion outside the aortic root or into the atrioventricular groove. Antimicrobials kill sensitive and exposed organisms but cannot reach those hiding in vegetations or biofilm, on foreign material, or in invaded extravascular tissue.

The objectives of surgery are to eliminate the source of embolism, debride and remove infected tissue and foreign material, expose and make residual organisms vulnerable to antimicrobials, and restore functional valves and cardiac integrity. Surgery to treat infective endocarditis is difficult and high-risk and requires an experienced surgeon. But final cure of the infection is still by antimicrobial treatment.

■ INFECTIVE ENDOCARDITIS NEEDS MULTIDISCIPLINARY CARE

Every aspect of infective endocarditis—diagnosis, medical management, management of complications, and surgery—is difficult. Recent guidelines^{2–6} therefore favor care by a multidisciplinary team that includes an infectious disease specialist, cardiologist, and cardiac

surgeon from the very beginning, with access to any other needed discipline, often including neurology, neurosurgery, nephrology, and dependence specialists. Patients with infective endocarditis should be referred early to a center with access to a full endocarditis treatment team. The need for surgery and the optimal timing of it are team decisions. The American Association for Thoracic Surgery infective endocarditis guidelines are question-based and address most aspects that surgeons must consider before, during, and after operation.²

■ IF SURGERY IS INDICATED, IT IS BEST DONE SOONER

Once there is an indication to operate, the operation should be expedited. Delays mean continued risk of disease progression, invasion, heart block, and embolic events. Determining the timing of surgery is difficult in patients who have suffered an embolic stroke—nonhemorrhagic or hemorrhagic—or who have suffered brain bleeding; management of these issues has recently triggered expert opinion and review articles.^{7,8} The recommendation for early surgery is based on the conviction that once the patient has been stabilized (or has overwhelming mechanical hemodynamic problems requiring emergency surgery) and adequate antimicrobial coverage is on board, there are no additional benefits to delaying surgery.⁹ When the indication to operate is large mobile vegetations associated with a high risk of stroke, surgery before another event can make all the difference.

In the operating room, the first aspect addressed is adequate debridement. There is wide agreement that repair is preferable to replacement for the mitral and tricuspid valves, but

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there is no agreement that an allograft (although favored by our team) is the best replacement alternative for a destroyed aortic root. The key is that surgeons and their surgical teams must have the experience and tools that work for them.

Our recommendation is to refer all patients with infective endocarditis to a center with access to a full team of experienced experts able to address all aspects of the disease and its complications. ■

REFERENCES

1. **Soud M, Pacha HM, Alraies MC.** How soon should patients with infective endocarditis be referred for valve surgery? *Cleve Clin J Med* 2018; 85(5):362–364. doi:10.3949/ccjm.85a:17052
2. **Pettersson GB, Coselli JS, Pettersson GB, et al.** 2016 The American Association for Thoracic Surgery (AATS) consensus guidelines: surgical treatment of infective endocarditis: executive summary. *J Thorac Cardiovasc Surg* 2017; 153(6):1241–1258.e29. doi:10.1016/j.jtcvs.2016.09.093
3. **Baddour LM, Wilson WR, Bayer AS, et al.** Infective endocarditis in adults: diagnosis, antimicrobial therapy, and management of complications: a scientific statement for healthcare professionals from the American Heart Association. *Circulation* 2015; 132(15):1435–1486. doi:10.1161/CIR.0000000000000296
4. **Habib G, Lancellotti P, Antunes MJ, et al.** 2015 ESC guidelines for the management of infective endocarditis: the Task Force for the Management of Infective Endocarditis of the European Society of Cardiology (ESC). Endorsed by: European Association for Cardio-Thoracic Surgery (EACTS), the European Association of Nuclear Medicine (EANM). *Eur Heart J* 2015; 36(44):3075–3128. doi:10.1093/eurheartj/ehv319
5. **Nishimura RA, Otto CM, Bonow RO, et al.** 2014 AHA/ACC guideline for the management of patients with valvular heart disease: executive summary: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *Circulation* 2014;129(23):2440–2492. doi:10.1161/CIR.0000000000000029
6. **Byrne JG, Rezai K, Sanchez JA, et al.** Surgical management of endocarditis: the Society of Thoracic Surgeons clinical practice guideline. *Ann Thorac Surg* 2011; 91(6):2012–2019. doi:10.1016/j.athoracsur.2011.01.106
7. **Yanagawa B, Pettersson GB, Habib G, et al.** Surgical management of infective endocarditis complicated by embolic stroke: practical recommendations for clinicians. *Circulation* 2016; 134(17):1280–1292. doi:10.1161/CIRCULATIONAHA.116.024156
8. **Cahill TJ, Baddour LM, Habib G, et al.** Challenges in infective endocarditis. *J Am Coll Cardiol* 2017; 69(3):325–344. doi:10.1016/j.jacc.2016.10.066
9. **Kang DH, Kim YJ, Kim SH, et al.** Early surgery versus conventional treatment for infective endocarditis. *N Engl J Med* 2012; 366(26):2466–2473. doi:10.1056/NEJMoa1112843

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