Archives of Cardiovascular Disease (2016) xxx, xxx—xxx

Available online at ScienceDirect www.sciencedirect.com

Elsevier Masson France EM|consulte www.em-consulte.com/en

SCIENTIFIC EDITORIAL

Early surgery in infective endocarditis: Why should we wait?

Chirurgie précoce dans l'endocardite infectieuse : pourquoi devrions-nous attendre ?

Leopold Oliver[a,b], Raphael Lepeule[b,c], Amina Moussafeur[a,b], Antonio Fiore[b,d], Pascal Lim[a,b], Julien Ternacle[a,b,*]

[a] *Department of Cardiovascular Medicine, Henri-Mondor University Hospital, AP—HP, Créteil, France*
[b] *SOS Endocardites Unit, Henri-Mondor University Hospital, AP—HP, Créteil, France*
[c] *Department of Infectious Diseases, Henri-Mondor University Hospital, AP—HP, Créteil, France*
[d] *Department of Cardiac Surgery, Henri-Mondor University Hospital, AP—HP, Créteil, France*

Received 5 October 2016; received in revised form 14 October 2016; accepted 14 October 2016

KEYWORDS
Infective endocarditis;
Early surgery;
Cerebral complication

Abbreviations: ACC, American College of Cardiology; AHA, American Heart Association; ESC, European Society of Cardiology; ICH, Intracranial haemorrhage; IE, Infective endocarditis.

* Corresponding author at: Department of Cardiovascular Medicine, Henri-Mondor University Hospital, 51, avenue de Lattre-de-Tassigny, 94100 Créteil, France.
E-mail address: julien.ternacle.hmn@gmail.com (J. Ternacle).

http://dx.doi.org/10.1016/j.acvd.2016.10.002

Please cite this article in press as: Oliver L, et al. Early surgery in infective endocarditis: Why should we wait? Arch Cardiovasc Dis (2016), http://dx.doi.org/10.1016/j.acvd.2016.10.002

MOTS CLÉS
Endocardite infectieuse ;
Chirurgie précoce ;
Complications cérébrales

Background

Despite prevention and aggressive treatment, the incidence of infective endocarditis (IE) remains stable and the prognosis is poor (mortality of 30% at 1 year). This situation may be explained, in part, by the increasing number of cases of IE related to nosocomial virulent microorganisms and prosthetic valvular or intracardiac device material endocarditis. Therapeutic management relies on high doses of intravenous antibiotics and early cardiac surgery to treat or prevent heart failure, uncontrolled infection and cerebral embolism [1,2]. Recent studies report surgical interventions in about 50% of cases [3], and an absence of surgery in 25% of patients despite an appropriate indication [4].

Timing of cardiac surgery in recent guidelines

Guidelines from the European Society of Cardiology (ESC) [1] and the American Heart Association/American College of Cardiology (AHA/ACC) [2] both highlight the need to refer patients to expert centres with an ''endocarditis team'' for optimal medical and surgical management. One major role of the endocarditis team is to define the optimal timing of cardiac surgery. Then, these expert centres require facilitated access to cardiac surgery and specific imaging and bacteriological platforms. Unlike the 2014 AHA/ACC guidelines, the 2015 ESC guidelines provide an accurate staging of early surgery according to hemodynamic status: early surgery is graded as ''emergency'' for surgery performed within 24 hours, ''urgent'' for surgery performed in < 7 days, and ''elective'' when surgery is to be performed after at least 1—2 weeks of antibiotic therapy.

Early surgery in patients without cerebral complications

Most studies have defined early surgery as surgery performed between 48 hours and 4 weeks. The benefit of surgery performed during the initial hospitalisation period has been recently reported in a large cohort of non-selected patients with IE [5] and confirmed by a recent meta-analysis (of 21 studies) that reported a decrease in 1-year mortality of 20% when surgery was performed within 7 days [6]. However, no randomised trial exists and there are discrepancies in observational series evaluating the impact of early surgery, mainly because of differences in statistical methods [7]. Early surgery appears particularly beneficial in high-risk patients with heart failure symptoms, large vegetations and IE caused by *Staphylococcus aureus* [8].

Heart failure

Heart failure is the strongest predictor of poor outcome and the primary cause of early surgery. The acute heart failure observed in 50% of patients with left-side IE [4] is mainly caused by severe regurgitation and is rarely related to intracardiac fistulae or valvular obstruction. Cardiac surgery is the only option and should not be delayed. The 2015 ESC guidelines [1] recommend performing cardiac surgery as an emergency (within 24 hours) for patients with cardiogenic shock or persistent pulmonary oedema, and within 72 hours (urgent) in case of non-refractory heart failure. In patients with severe valvular regurgitation without heart failure, the timing of surgery is unclear, but early surgery may be a reasonable option in low-risk patients, especially when subclinical signs of poor hemodynamic tolerance are suspected on echocardiography.

Uncontrolled infection

Uncontrolled infection is the second cause of early surgery, and includes general and local uncontrolled infection. General uncontrolled infection is defined by unexplained persistent bacteremia after 1 week of adequate antibiotic treatment and is generally caused by virulent microorganisms (fungi, multiresistant organisms, *S. aureus* or non-HACEK [i.e. species other than *Haemophilus* species, *Actinobacillus actinomycetemcomitans*, *Cardiobacterium hominis*, *Eikenella corrodens* or *Kingella*] gram-negative bacteria). Urgent surgery is recommended to prevent local and general complications: preventive for IE caused by virulent microorganisms; and curative for general uncontrolled infection.

Abscesses and increases in vegetation size under antibiotic therapy are also considered to be local uncontrolled infections. Antibiotic therapy has limited effect on these local complications and urgent surgery should be performed to prevent the risk of sudden cardiac death or an embolic event. An abscess complicated by a pseudo-aneurysm or a fistula may be challenging to identify on transesophageal echocardiography, and the ESC guidelines [1] highlight the importance of using multimodality imaging to improve diagnostic accuracy.

Embolic events

Embolic events are usually asymptomatic and frequent (30—50%) [9,10] but can be a life-threatening complication. The risk of an embolic event is major before the initiation of antibiotics [10] but decreases promptly after initiation of antibiotic therapy (8—12%) [10,11], especially after 2 weeks. The risk of embolism depends on several variables (age,

Please cite this article in press as: Oliver L, et al. Early surgery in infective endocarditis: Why should we wait? Arch Cardiovasc Dis (2016), http://dx.doi.org/10.1016/j.acvd.2016.10.002