Is surgery useful in infective endocarditis?

Rôle de la chirurgie dans le traitement de l’endocardite infectieuse

François Delahaye*, Guy de Gevigney

Service de cardiologie, hôpital Louis-Pradel, hospices civils de Lyon, université Claude-Bernard Lyon-I, 28, avenue du Doyen-Lépine, 69677 Bron, France

Available online 21 November 2008

Although relatively rare, infective endocarditis (IE) remains a severe disease: the inhospital mortality rate is around 20% overall, but is much higher in complicated cases. Prognosis can be improved in several ways:

- earlier diagnosis: in most cases it can take several weeks or even months to be diagnosed with IE. Earlier diagnosis would mean less advanced valvular lesions, and therefore less haemodynamic impairment and fewer emboli and abscesses;
- appropriate antibiotic therapy: antibiotics effective against the microorganism should be used, and at the correct doses and duration of treatment;
- avoiding delay to cardiac surgery in complicated cases. This remains the main issue for physicians involved in the care of patients with IE, worldwide.

Historically, the dogma was to avoid surgery during the acute phase since the tissues are inflamed and infected, making surgery very difficult, and leading to high postoperative mortality and high risk of valve dysfunction. This belief has changed dramatically over the past two decades; owing to improvements in surgical technique, cardiac surgeons no longer refuse to operate very early. In France, the rate of surgery during the acute phase of IE has increased from 30% in 1991 to 50% in 1999 [1]. Indications for surgery are well defined in international guidelines, but they are based on expert opinion since there are no randomized data from clinical trials [2,3]. No data exist for the optimal timing of surgery. Surgery cannot be delayed in patients with the most severe complications, and has to be performed during the first week of antibiotic treatment. This raises concerns about operative mortality and risk of valve dysfunction since material is implanted in infected tissues. The paper by Thuny et al. in this issue of the journal, brings new and original information.
about early surgery for IE. The authors present data on the outcomes of patients operated on during the first week of antibiotic therapy [4]. Between 1992 and 2007, among 534 consecutive patients with definite IE admitted to the cardiology department of public tertiary hospitals in Marseille, 95 patients were operated on during the first week of treatment. Indications for surgery were haemodynamic impairment or severe left valve regurgitation with elevated left ventricular end-diastolic or left atrial pressure (75 patients), high embolic risk due to emboli with persistent greater than 10 mm vegetation or greater than 15 mm vegetation without emboli (56 patients) and presence of a periannular extension (40 patients). One quarter of the patients underwent surgery within 24 h. A veetectomy was performed in one patient. Mitral surgery was a repair in 20 patients, a biological prosthesis in 24 and a mechanical prosthesis in six. The in-hospital mortality rate was 15%. At 3 years, the combined rate of cardiovascular death or recurrence of IE or noninfective valve dysfunction was 38%. Recurrence occurred in 12% of patients and noninfective valve dysfunction in 7%. The main predictor of a poorer prognosis was periannular extension.

These figures were better than expected, and were considered as relatively satisfactory by the authors. While the in-hospital mortality rate was 15% in this particularly severe population, it was 16% in an unselected group of patients with IE in the 1999 French study [1].

We still do not know whether surgery during the acute phase of IE improves a patient’s prognosis. No randomized trial data exist. Several observational studies have been published recently that examined the influence of surgery on prognosis in patients with IE [5—9]. The results are apparently conflicting: two studies showed a beneficial effect of surgery [5,6], while two showed no effect [7,8] and one showed a detrimental effect [9]. All of these studies used propensity scores which take into account the probability of deriving benefit from surgery when studying the relation between an intervention and the outcome [10]. The propensity to benefit from an intervention is the probability for a patient to be in the treated group according to his/her characteristics. For example, if nonoperated patients are older than operated ones, propensity analysis allows us to study the effect of surgery on mortality after adjusting for age. When the French study group on IE applied the techniques used in each study to the French 1999 database, there were no more conflicts. The disagreement in the results was due to the use of different statistical methods. When the correct technique is used, surgery is beneficial. Early valve surgery was associated with a significant increase in short-term mortality (≤ 2 weeks after surgery; adjusted hazard ratio 3.7; 95% confidence interval 2.2—6.2; p < 0.0001) and a significant decrease in long-term mortality (adjusted hazard ratio 0.5; 95% confidence interval 0.3—0.9; p = 0.01). At least 6 months of follow-up were needed to compensate for the high postsurgery mortality.

Researchers have for a long time attempted to conceive a randomized trial of surgery versus medical treatment alone in the care of patients with IE. Fortunately, a group of Spanish investigators have recently launched such a study, the protocol for which was published recently [11]. Patients with an urgent or emergent indication for surgery when IE is diagnosed (heart failure because of valvular insufficiency, fungal IE or septic shock) will be excluded. Patients with IE without an indication for surgery will be included if they meet at least one of the following criteria: early-onset prosthetic IE; Staphylococcus aureus IE; periannular complications; new-onset conduction abnormalities; or new-onset severe valvular dysfunction. A total of 216 patients will be randomized, within 3 days of hospital admission, to either of the two strategies. Surgery will be performed within 48 h of randomization in the early surgery arm.

Thuny et al.’s report in the present issue of the journal adds to our knowledge in this field. Now, we eagerly await new data for the efficacy of early surgery in reducing the high mortality rate from IE.

References