

Surgical Treatment of Valvar Endocarditis

Dr. Edmo Atique Gabriel, Marina Alves Jacintho de Mello and Camila Alcalde Mazza*

Union of the Colleges of the Great Lakes- UNILAGO, Brazil.

***Correspondence:**

Camila Alcalde Mazza, Union of the Colleges of the Great Lakes- UNILAGO, Brazil.

Received: 28 December 2019; Accepted: 14 January 2020

Citation: Edmo Atique Gabriel, Marina Alves Jacintho de Mello, Camila Alcalde Mazza. Surgical Treatment of Valvar Endocarditis. *Cardiol Vasc Res.* 2020; 4(1); 1-5.

ABSTRACT

Infective endocarditis can be described by the trust in its diagnosis (Duke's criterion), by its causative microorganisms, its infectious activity, its location, by affecting a prosthetic or native valve, its pathological characteristics and its cardiac and extracardiac complications. Although endocarditis treatment has improved, endocarditis remains a serious disease. The reasons that led to this study, which aims to address the surgical treatment of valve endocarditis. For that, a bibliographic research was done on the subject.

Keywords

S. aureus, Valve endocarditis, Surgery, Heart diseases.

Introduction

In the last 10 years, we observed an increase in endocarditis caused by Enterococcus and a corresponding decrease in disease caused by species of Staphylococcus. Infection caused by *S. aureus* remains associated with a worse prognosis. Polymerase chain reaction plays a growing role in identifying the organism.

The disease develops in stages: adherence, vegetation followed by tissue invasion and destruction. Bacterial enzymes disintegrate tissue and allow bacteria to enter the tissue. Disintegration causes perforation and rupture of the cusp and leaflet, which results in valve regurgitation. Bacterial invasion and perivalvar destruction result in abscesses, cavities and fistulas, more frequently in patients with endocarditis of valvar prosthesis than in patients with native valve endocarditis.

Heart block, a common complication of aortic valve endocarditis, is most often caused by the destruction of the atrioventricular node and the upper extremity of the bundle of His. The fungal infection forms larger vegetations, but is less destructive.

This study deals with the surgical treatment of valve endocarditis, considering the relevant information on the subject.

For the initial understanding of the research, Figure 1 shows a case

of endocarditis of valvar prosthesis with complete cardiac block, so that the subject can be understood, also in an illustrative way and thus, relate it to the theoretical questions considered in this research.

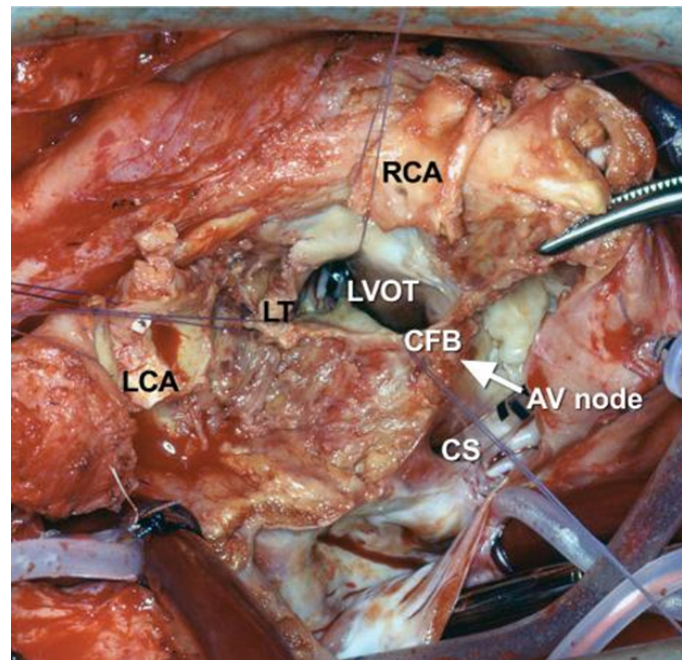


Figure 1: Case of endocarditis of valvar prosthesis with complete heart block. Source: [1].

In a case of endocarditis of valvar prosthesis with complete heart block, we see the left ventricular outflow tract after removal of the prosthesis and debridement of all infected tissue. The photograph illustrates how the infection spread counterclockwise around the left and left ventricle outflow tract penetrated the right atrium and the Koch triangle to ultimately destroy the atrioventricular node and cause complete heart block.

For an understanding of the illustration (Figure 1), the following legend should be considered: AV = atrioventricular; CFB = central fibrous body; CS = coronary sinus; LCA = left coronary artery; LT = lateral trine; LVOT = left ventricular outflow tract; RCA = right coronary artery.

International acronyms have been used, so that everyone can understand the figure, without the need for a translator.

Surgical indication

The recent controversy over the value of surgery in the treatment of endocarditis is confusing to surgeons who deal with endocarditis in its more advanced stages of invasion and destruction. Most patients who are operated on for endocarditis have severe valvular dysfunction and would need surgery anyway. In addition to valvular dysfunction and heart failure, established indications for surgery are advanced invasive disease (including perivalvar cellulitis, abscesses or pseudoaneurysms and intracardiac fistulas), endocarditis of valvar prosthesis, difficult-to-treat organisms (such as *Pseudomonas* and fungi), persistent bacteremia, great vegetation and emboli. Surgery should be considered early, not late [1].

If all patients with valve prosthesis endocarditis need surgery it is questionable because antibiotics can cure the infection confined to bioprosthetic valve leaflets. Surgery exclusively to prevent stroke in patients who have large mobile vegetation remains controversial. And how should we deal with perivalvular cavities in the absence of major valvular dysfunction? Are they themselves an indication for surgery? This is a matter of judgment. A larger cavity presents a greater risk of reinfection, aneurysmal formation and thrombus formation and subsequent thromboembolism. Small cavities can probably be monitored [2].

Preoperative testing

Computed tomography or magnetic resonance imaging of the brain should be performed on all of these patients. The finding of hemorrhagic infarction indicates increased perioperative risk and may be reason to postpone surgery for 1 to 2 weeks or longer. Cerebral angiography is necessary to exclude mycotic aneurysm [3].

Operation

An intraoperative transesophageal echocardiographic study is mandatory. Extensive and complete debridement is the key to success. Abscesses, cavities, fistulas and areas of cellulite should be screened and opened. It is important to remove any old foreign material due to a possible infection. The choice of method (valve replacement and patching material) for reconstruction is probably

less important because success has been proven with virtually any valve prosthesis and conduit. Cleveland Clinic Foundation surgeons still prefer left ventricular outflow tract allograft reconstruction in patients with advanced disease [3].

If additional tissue is needed for reconstruction, autologous or bovine pericardium is used. The mitral valve should be repaired whenever possible.

Intravenous antibiotic treatment in the postoperative period for 6 weeks is our routine for active infection. Antibiotic treatment should ensure the eradication of cardiac infection as well as any primary and metastatic infectious foci. Fungal endocarditis may justify antifungal treatment throughout life [4].

Early surgery

Early surgery is recommended for patients with complicated infective endocarditis (IE), but randomized trial data are scarce. The following points are to remember about the time of surgery among patients with IE:

The main indications for early surgery in IE are heart failure, uncontrolled infection and prevention of embolization. The reduction in mortality with surgery is greater among patients with IE and moderate to severe heart failure.

Heart failure

According to Gaca [1], the European Society of Cardiology (ESC) guideline (2009) recommends emergency surgery for heart failure with refractory pulmonary edema or cardiogenic shock (Class I) or emergency surgery for persistent heart failure with signs of low hemodynamic tolerance (Class IIa). The American Heart Association (AHA) / American College of Cardiology (ACC) (2014) guideline recommends early surgery for valve dysfunction that causes heart failure (Class I).

Uncontrolled infection

Gaca [1] recalls that the ESC guideline recommends urgent surgery (Class I) for evidence of uncontrolled infection defined as abscess, fistula or pseudoaneurysm; or for increased vegetation, persistent fever, or positive blood cultures after 7-10 days of appropriate therapy. The AHA / ACC guideline recommends early surgery (Class I) for evidence of persistent infection, heart block or abscess, or a resistant organism (*S. aureus*, fungi).

Prevention of embolization

For Sabik [4], the ESC guideline recommends urgent surgery for vegetation > 10 mm with previous embolization or other surgical indication (Class I), or for isolated vegetation > 15 mm and viable valvular repair (Class IIb). The AHA / ACC guideline recommends early surgery for recurrent emboli and persistent vegetations, despite adequate antibiotic therapy (Class IIa); or a large mobile vegetation on a native valve (Class IIb).

Neurological complications

According to Sabik [4], patients with a neurological complication may have other indications for early surgery. However, early surgery

may represent a significant risk for perioperative neurological deterioration (related to anticoagulation, potentiating the risk of intracerebral bleeding and hypotension during cardiopulmonary bypass, worsening neurological ischemia and edema).

Prosthetic valve IE

Valve prosthesis endocarditis is the most serious form of IE and more difficult to treat with antibiotics alone. In general, current guidelines support the consideration of a surgical strategy for subgroups at high risk with valve prosthesis IE, including patients with heart failure, abscess or persistent fever [1].

Definitions of early surgery

There is no consensus as to the optimal timing of early surgery. The ESC guideline classifies the surgical indications in IE as emergent (within 24 hours), urgent (within a few days) and elective (after 1-2 weeks of antibiotic therapy). The AHA / ACC guideline defines early surgery as occurring during initial hospitalization and prior to completion of a full therapeutic course of antibiotics [1].

Conclusion

Nowadays, results after surgery for endocarditis have improved to

the extent that the overall operative mortality rate is now below 10%. In particular, the results after infection of the valve prosthesis are now equal to those of native valve endocarditis. The fundamentals in the management of endocarditis are precise microbiological diagnosis, state-of-the-art technology echocardiogram, optimal antibiotic scheme, adequate timing and surgery, and adequate follow-up. A good understanding of the advanced state of the disease and radical debridement is more important to success than choosing the reconstruction method.

References

1. Gaca JG, ShengS, Daneshmand MA, et al. Results for endocarditis surgery in North America: a system simplified risk scoring. *J Thorac Cardiovasc Surg.* 2011.
2. Olaison L, Pettersson G. Best practices and guidelines current. Indications for surgical intervention in endocarditis infectious. *Cardiol Clin.* 2003.
3. Pettersson G, Carbon C. Recommendations for treatment endocarditis. *Clin Microbiol Infect.* 1998; 4: 34-46.
4. Sabik JF, Lytle BW, Blackstone EH, et al. Root replacement cryopreserved allograft aortic valve for endocarditis valve prosthesis. *Ann Thorac Surg.* 2002; 74: 650-659