

ESC Guidelines for the management of infective endocarditis 2015

Surgical therapy: principles and methods

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Table 22 Indications and timing of surgery in left-sided valve infective endocarditis (native valve endocarditis and prosthetic valve endocarditis)

Indications for surgery	Timing ^a	Class ^b	Level ^c	Ref. ^d
1. Heart failure				
Aortic or mitral NVE or PVE with severe acute regurgitation, obstruction or fistula causing refractory pulmonary oedema or cardiogenic shock	Emergency	I	B	111,115, 213,216
Aortic or mitral NVE or PVE with severe regurgitation or obstruction causing symptoms of HF or echocardiographic signs of poor haemodynamic tolerance	Urgent	I	B	37,115, 209,216, 220,221
2. Uncontrolled infection				
Locally uncontrolled infection (abscess, false aneurysm, fistula, enlarging vegetation)	Urgent	I	B	37,209, 216
Infection caused by fungi or multiresistant organisms	Urgent/ elective	I	C	
Persisting positive blood cultures despite appropriate antibiotic therapy and adequate control of septic metastatic foci	Urgent	IIa	B	123
PVE caused by staphylococci or non-HACEK gram-negative bacteria	Urgent/ elective	IIa	C	
3. Prevention of embolism				
Aortic or mitral NVE or PVE with persistent vegetations >10 mm after one or more embolic episode despite appropriate antibiotic therapy	Urgent	I	B	9,58,72, 113,222
Aortic or mitral NVE with vegetations >10 mm, associated with severe valve stenosis or regurgitation, and low operative risk	Urgent	IIa	B	9
Aortic or mitral NVE or PVE with isolated very large vegetations (>30 mm)	Urgent	IIa	B	113
Aortic or mitral NVE or PVE with isolated large vegetations (>15 mm) and no other indication for surgery ^e	Urgent	IIb	C	

- ▶ Homografts
- ▶ Autografts
- ▶ Xenografts
- ▶ Mechanical prostheses

(1) Operative risk assessment :

- EuroSCORE II
- Thoracic Surgeons database

Although the theoretical indications for surgery in IE are clear , their practical application relies largely on the **clinical status** of the patient, the patient's comorbidities and the patient's operative risk.

(2) Preoperative and perioperative management:

- ▶ **Coronary angiography:**

Coronary angiography is recommended according to the ESC Guidelines on the management of valvular heart disease

- ▶ **Extracardiac infection:**

eradicated before cardiac surgical

- ▶ **Intraoperative echocardiography:**

TOE

(3) Surgical approach and techniques:

► **The two primary objectives of surgery are :**

- 1) Total removal of infected tissues
- 2) Reconstruction of cardiac morphology

including repair or replacement of the affected valve(s).

(3) Surgical approach and techniques:

- ▶ Where infection is **confined** to the valve cusps or leaflets, any method to repair or replace the valve may be used
- ▶ However, valve **repair** is favoured whenever possible, particularly when IE affects the mitral or tricuspid valve without significant destruction .
- ▶ Isolated or multiple ruptured chordae may be **replaced** by polytetrafluoroethylene neo-chordae.

(3) Surgical approach and techniques:

- ▶ More extensive destruction of a single leaflet or the presence of an abscess is **not necessarily** a contraindication for valve repair .
- ▶ Rather, **intraoperative** assessment of the valve after debridement is of paramount importance
- ▶ To avoid paravalvular **leaks** in complex cases with locally uncontrolled infection, total excision of infected and devitalized tissue should be followed by **valve replacement** and repair of associated defects to secure valve fixation.

(3) Surgical approach and techniques:

- ▶ Mechanical and biological prostheses have **similar** operative mortality.
- ▶ **Small** abscesses can be closed directly, but **larger** cavities should be allowed to drain into the pericardium or circulation.

(3) Surgical approach and techniques:

Mitral Valve

- ▶ In mitral valve IE, successful valve **repair** can be achieved by experienced teams in up to **80%** of patients
- ▶ Residual mitral regurgitation should be assessed using **intraoperative TOE**.
- ▶ The choice of technique depends on the **vertical extension** of the lesion/tissue defect.
- ▶ The use of mitral valve homografts and pulmonary autografts (Ross II procedure) has been suggested
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(3) Surgical approach and techniques:

Aortic Valve

- ▶ In aortic IE, **replacement** of the aortic valve using a mechanical or biological prosthesis is the technique of choice.
- ▶ It is **expert opinion** and standard strategy in many institutions that the use of a **homograft** is to be favoured over valve prostheses, particularly in the presence of root abscess.
- ▶ However, mechanical prostheses and xenografts have led to **similar** results in terms of persistent or recurrent infection and survival if associated with complete debridement of annular abscesses.

(3) Surgical approach and techniques:

Aortic Valve

- ▶ Homografts or stentless xenografts may be preferred in **PVE** or in cases where there is extensive aortic root destruction with aorto-ventricular discontinuity.
- ▶ **Amonoblock** aorto-mitral homograft has been suggested as a surgical option for extensive bivalvular IE.
- ▶ In experienced hands, the **Ross procedure** may be used in children or adolescents to facilitate growth and in young adults for extended durability.

(4) Postoperative complications:

► **10% to 20% in most series**

► **Among the most frequent complications are:**

1. Severe coagulopathy requiring treatment with clotting factors
2. Re-exploration of the chest for bleeding or tamponade
3. Acute renal failure requiring haemodialysis
4. Stroke
5. low cardiac output syndrome
6. Pneumonia
7. Atrioventricular block following radical resection of an aortic root abscess with the need for pacemaker implantation

Table 24 Factors associated with an increased rate of relapse

• Inadequate antibiotic treatment (agent, dose, duration)
• Resistant microorganisms, i.e. <i>Brucella spp.</i> , <i>Legionella spp.</i> , <i>Chlamydia spp.</i> , <i>Mycoplasma spp.</i> , <i>Mycobacterium spp.</i> , <i>Bartonella spp.</i> , <i>Coxiella Burnetii</i> , fungi
• Polymicrobial infection in an IVDA
• Empirical antimicrobial therapy for BCNIE
• Periannular extension
• Prosthetic valve IE
• Persistent metastatic foci of infection (abscesses)
• Resistance to conventional antibiotic regimens
• Positive valve culture
• Persistence of fever at the seventh postoperative day
• Chronic dialysis

THANK YOU