

Infective aortic valve endocarditis with root abscess formation: a mitral sparing root-*Commando* operation

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Clinical vignette

A 59-year-old male with rheumatoid arthritis treated with methotrexate and *Staphylococcus epidermidis* late prosthetic valve endocarditis is referred with new atrioventricular block. Echocardiography confirms aortic root abscess with intervalvular fibrosa (IVF) involvement and severe aortic prosthesis stenosis (gradient 65/46 mmHg) but no major perivalvular leak. External computed tomography (CT) scan demonstrated recent visceral and renal embolism. This patient had an EuroSCORE II of 28%. Surgery was performed within the first 12 hours after admission to our center. A cryopreserved aortic homograft was obtained from our local cardiovascular tissue bank (1). The homograft was transported and stored in a dry-shipper with nitrogen in gas phase (−140 °C) and readily available as dictated by operative intracardiac findings.

Surgical techniques

Preparation

A pulmonary artery catheter is used in view of complex intracardiac reconstruction requiring a potentially prolonged aortic cross clamp. Central cannulation remains the first choice in the absence of increased chest re-entry risk.

Exposition

The decision to proceed with double venous cannulation is based on the eventual access to the right atrium to explore

further endocarditic involvement or improve exposure and facilitate reconstruction beyond the aortic root involvement. Timing and location of left sided vent catheter is decided according to the presence of vegetations to prevent intraoperative embolism. Myocardial protection is achieved with blood cardioplegia.

Operation

After excision of the infected prosthesis, annular debridement is performed. Any suspicious tissue will be resected and the necessary reconstruction judged afterwards (video). When annular anatomy precludes securement of a sutured valve prosthesis then an aortic root homograft is our first choice. Extensive coronary mobilization ensures complete subcoronary debridement and improved homograft securement. When the IVF is extensively involved in conjunction with the anterior mitral leaflet this operation is best performed through the roof of the left atrium. The reconstruction of the roof of the left atrium, IVF and mitral leaflet is achieved by a tailored single bovine pericardial patch. In the case described herein, a posterior mitral annuloplasty is added to the reconstruction to increase the coaptation height but avoiding iatrogenic systolic anterior motion. Furthermore, this maneuver can decrease the risk of late onset mitral regurgitation in the event the pericardial patch biology alters the surface of the anterior leaflet with time. Trigonal securement is key to avoid bleeding and mitral detachment. An aortic root homograft is aligned trigone to trigone with the

reconstructed mitral structures. The suture line is placed at a higher plane from the attachment of the pericardium to the mitral leaflet at the newly created atrial roof (on top of pericardial patch). The remaining root securement is obtained also with 3/0 polypropylene semi continuous in the debrided left ventricular outflow tract. The coronary ostia are reimplanted and the operation is completed.

Completion

Blood pressure during the first 6–12 postoperative hours is maintained with a target systolic blood pressure around 100 mmHg. Only low dose norepinephrine support was required and early extubation was achieved. The patient had a favorable recovery, completing 4 weeks of intravenous antibiotics with a pre-discharge echocardiogram demonstrating anatomic reconstruction with normal bivalve function. He is currently leading an unrestricted life.

Comments

Clinical results and advantages

Aortic root abscess is known to be associated with increased mortality in patients undergoing surgery for active left-sided endocarditis (2). Patients with involvement of the IVF with extension towards the mitral valve constitute a further higher-risk population that will most likely face dismal prognosis without surgery. Many variants of the reconstruction of the aortic root and IVF (also known as the *Commando* operation) facilitate reproducible, complex repairs to grant survival and avoid the need for urgent cardiac transplantation. Structural involvement of the aortic root and mitral valve as well as the preoperative patient condition leads to the need to use a tailored approach selecting from many available options. In brief, when the aortic root is spared beyond the IVF region, a double valve replacement with IVF reconstruction may be enough (3). However, if root involvement dictates the need for root replacement, then a root-*Commando* with mitral replacement (4) or sparing of the mitral valve (5) may be the only reconstructive options. With an aggressive debridement philosophy, we have not experienced relapses of the original infection in the last 5 years. During the same time frame, survival for *Commando* operation variants has been above 94% at Hospital Clínic de Barcelona in patients that would otherwise face a foreseeable demise. The need for a timely referral to a specialized endocarditis team is mandatory.

Caveats

It is important to note that the mitral-sparing *Commando* operation has been barely reported in the surgical literature and the need to judge its appropriateness at long term follow-up remains. However, at this point, it seems arguable that a technically impeccable operation should result in a durable valve repair. Whichever approach is chosen, it is key to obtain full debridement before implanting any valve substitute.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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