

## CASE REPORT

# Bentall procedure plus mitral valve replacement and closure of patent ductus arteriosus in a patient with mitral and aortic endocarditis. A case report

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*Infective endocarditis is a rare disease that affects cardiac tissues, as well as prosthetic valves and intracardiac devices. Aortic root abscess is a severe form of infective endocarditis of the aortic valve and surrounding tissues. We present here in a case of 27-year-old male, with a history of congenital heart disease, diagnosed with mitral-aortic endocarditis, who underwent emergency surgery, which required aortic root replacement due to intraoperative findings with mitral valve replacement and closure of the patent ductus arteriosus.*

**Key words:** Aortic root abscess; Bentall procedure; Mitral-aortic endocarditis.

*La endocarditis infecciosa es una enfermedad poco frecuente que afecta a los tejidos cardiacos, así como a las prótesis valvulares y dispositivos intracardiacos. El absceso de la raíz aórtica es una forma grave de endocarditis infecciosa de la válvula aórtica y los tejidos adyacentes. El presente caso trata de un masculino de 27 años, con antecedente de cardiopatía congénita, con diagnóstico de endocarditis mitro-aórtica, el cual se intervino de manera emergente, y que ameritó reemplazo de raíz aórtica debido a los hallazgos transoperatorios con reemplazo valvular mitral y cierre de conducto arterioso persistente.*

**Palabras clave:** Absceso de raíz aórtica; procedimiento de Bentall; Endocarditis mitro-aórtica.

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Infective endocarditis (IE) is a rare disease that affects cardiac tissues, as well as valve or vascular prostheses and intracardiac implanted devices of all kinds. It is associated with high morbidity and mortality of up to 20-25%. Its incidence is estimated between 1.5 and 11.6 cases per 100,000 inhabitants [1]. Risk factors include rheumatic disease, valve abnormalities or birth defects, prosthetic valve and vascular implants, antiarrhythmic intracardiac devices, as well as placement of hemodialysis catheters and the use of intravenous drugs. It is worth mentioning that involvement on the native valve remains the most frequent form ahead of the prosthetic valve, representing up to 56% of cases [2].

Aortic root abscess is a severe form of IE from the aortic valve and adjacent tissues. In its clinical presentation, uncontrolled aortic root abscess may manifest as loculation with perforation, cardiac fistula, or rupture in a cardiac chamber, pseudoaneurysm, or arrhythmia leading to hemodynamic instability [3].

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### CLINICAL CASE

A 27-year-old male with a history of patent ductus arteriosus diagnosed in childhood without treatment, which 2 months prior to his admission he suffered with weight loss, adding fever quantified at 38.6°C, persistent, anorexia, asthenia and adynamia. He was admitted in Internal Medicine Service where he received antibiotic management with vancomycin and ceftriaxone. The patient developed hemodynamic deterioration that required management with vasopressors. The echocardiogram showed bicuspid aortic valve in addition to vegetation of 12mm by 14mm and moderate to severe insufficiency, moderate to severe mitral insufficiency due to anterior leaflet perforation and vegetation 5mm by 3mm in the same leaflet, aortic root diameter 29 mm, patent ductus arteriosus of 6mm by 8mm by 13mm and mild tricuspid insufficiency (Fig. 1). Given these findings, emergent surgical management was decided.

It was addressed by means of a medium sternotomy, central and unicaval cannulation. Aortotomy was performed for direct administration of cardioplegia and an abscess was ob-

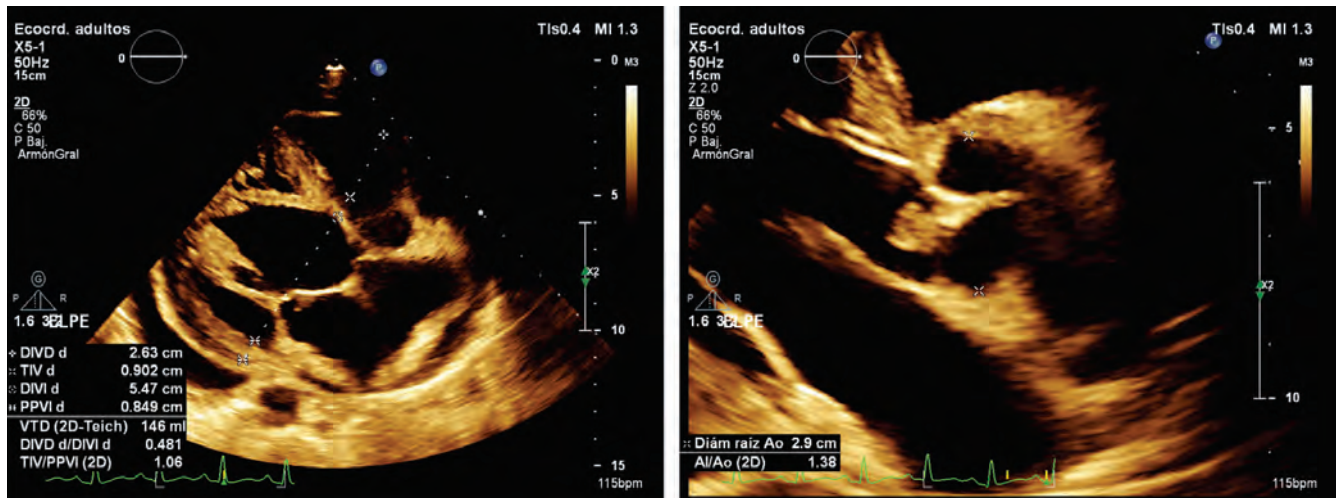


Figure 1. Echocardiographic study showing vegetations in aortic valve and anterior leaflet of the mitral valve.

served with destruction of the aortic root and its wall (Fig. 2). Cold cardioplegia with custodiol was administered. In addition to perforation of the non-coronary leaflet with vegetation of 1cm by 1cm, perforation of the anterior leaflet of the mitral valve with vegetation of 8x5mm was also observed. We proceeded first to the surgical closure of the patent ductus arteriosus with transpulmonary technique, followed by mitral valve replacement, with exposure through Waterston's groove. A 29 mm mechanical prosthesis was installed, and finally Bentall procedure was performed with 23 mm prostheses (Fig. 3) (Fig. 4) having a cardiopulmonary bypass time of 225 min, and aortic cross-clamping time of 195 min. Subsequently, the patient was admitted to the coronary care unit where he presented cardiorespiratory arrest due to ventilator-associated pneumonia 37 days after the postoperative period.

## COMMENT

Aortic root abscess is a catastrophic complication of aortic root endocarditis that can involve other structures such as the mitral valve and even conducting tissue, and the formation of fistulous tracts, often warranting surgical intervention. Currently, aortic valve replacement and aortic root replacement together with damaged valve replacement are the most widely used techniques [1].

Among the factors that contribute to early mortality is active endocarditis, which usually carries a higher risk due to the urgent/emergent nature of the surgery. Timing of the surgical intervention depends on the anatomical condition and the extravalvular extension of the IE, tissue destruction due to infection and inflammatory process resulting in severe hemodynamic alterations [2].

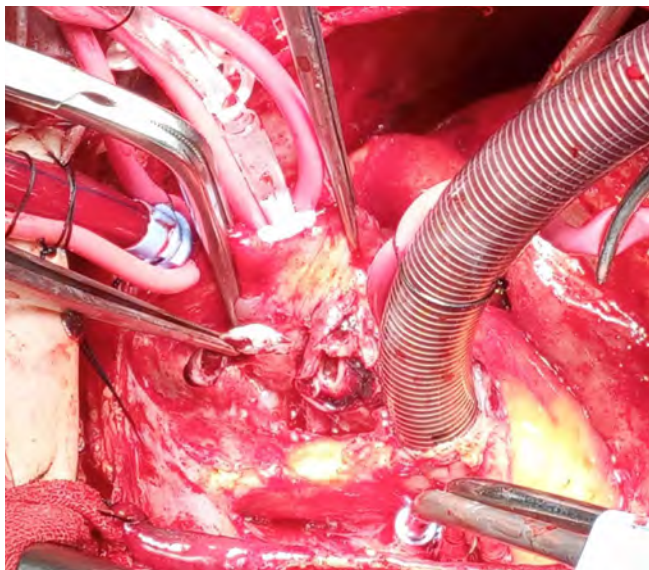


Figure 2. Area of necrosis in aortic root.

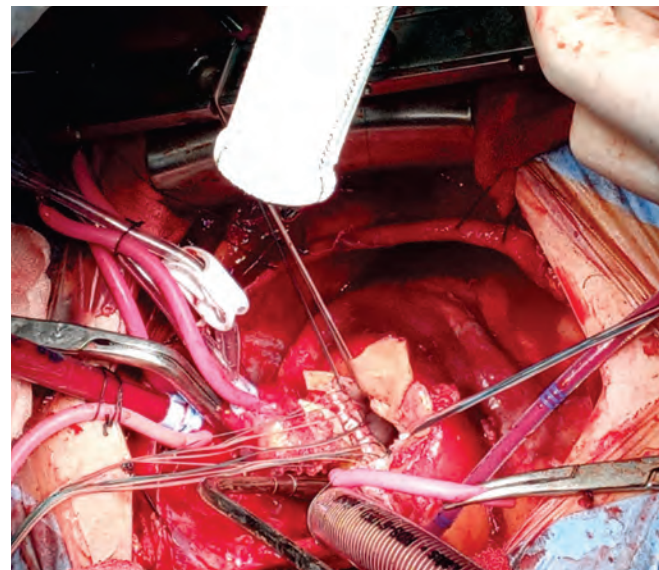


Figure 3. Placement of valve graft.



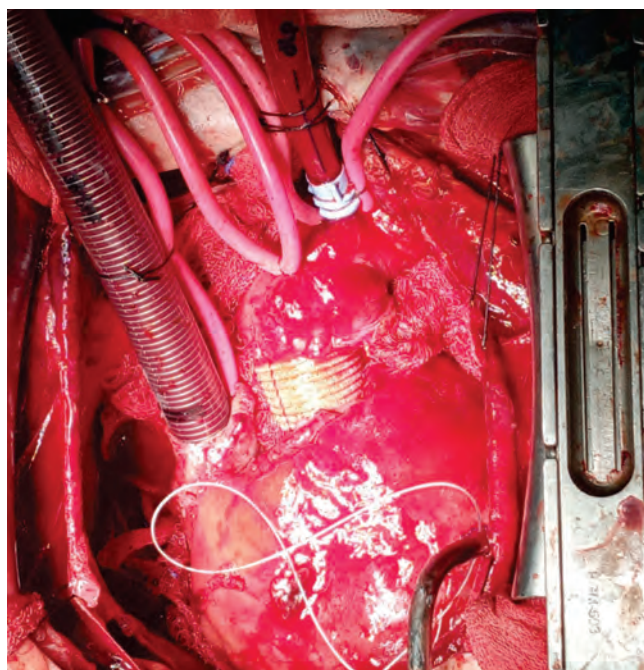


Figure 4. Bentall procedure completed.

The presence of multivalvular involvement is another factor that adds to mortality and any delay in surgery can promote the risk of devastating damage to the surrounding tissue. The situation also worsens when there is the presence of infected prosthetic valves. For native aortic valve IE, repair is only possible in a few cases, and although advances in

pharmacology have led to better antibiotic therapy, mortality and morbidity rates have remained high due to periannular sequelae. [3].

When the disease is invasive, root reconstruction and replacement is usually required. To do this, it is necessary to debride all the infected tissues around the aortic ring and the tissues adjacent to it, such as the continuity between the aortic and mitral rings, which makes it necessary to take measures to replace the latter, in addition to the fact that it can endanger the valve repair, damage the coronary arteries, cause permanent heart block, and make reconstruction difficult.

After complete resection of the periannular abscess, aortic root replacement for aortic root reconstruction, with or without left ventricular outflow tract injuries, can be implemented with a beaded composite graft that may provide the best anatomic fit [ 4].

The optimal management of patients with periannular extension of IE requires a multidisciplinary approach, with the surgical contribution being an integral part of the treatment associated with the evolution of complex reconstructive techniques [5].

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