

Indication and Timing of Surgery in Patients With Endocarditis of the Tricuspid Valve

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Abstract

Endocarditis of the right heart is a particular form of infective endocarditis, it often affects intra venous (IV) drug addicts, it can be severe, its diagnosis is based on Duke's criteria, it can be complicated by pulmonary or paradoxical emboli which can sometimes worsen the clinical situation, in addition to antibiotics surgical treatment is sometimes necessary for recovery, the indication for which depends on several clinical, anatomical, and biological criteria. The aim of this review is to illustrate the indications and place of the different surgical methods in the management of tricuspid endocarditis, as well as the best time for the operation.

Keywords : Tricuspid endocarditis, drug addiction, surgical criteria, optimal timing, prognosis.

Introduction

Infective endocarditis is a microbial infection invading the endocardium, which can cause major damage. To this day, it remains a difficult clinical entity, most often involving the left heart. The incidence of isolated infective endocarditis of the tricuspid valve has increased considerably in recent years, accounting for around 5-10% of cases of endocarditis [1], the majority of which occur in the context of intravenous drug use. Over 50% of cases of tricuspid IE are due to *Staphylococcus aureus* [2]. Medical management is the cornerstone of treatment, but surgery is required in a subset of patients. Surgical management of tricuspid valve endocarditis can be performed with satisfactory results. However, the optimal indication and timing of surgery remain uncertain, and the frequent association with intravenous drug abuse complicates management [3].

Observation

We report the case of Mrs B. S, aged 31 years, admitted to the cardiology department of CHU Benmessous, for treatment of isolated tricuspid infective endocarditis. The patient presented with a clinical infectious syndrome (fever peaks at 40°C, progressive weight loss) 40 days after a laborious vaginal delivery, for which she received symptomatic treatment, but with no improvement. Subsequently, the patient developed signs of pneumopathy, prompting a chest CT scan, which revealed images suggestive of septic emboli, leading to her referral to the cardiology department of the Benmessous University Hospital, Algiers. The clinical examination revealed a murmur at the tricuspid focus, which led to a transthoracic echocardiogram. This revealed extensive damage to the tricuspid valve, with the appearance of very large mobile vegetation on the anterior valve, affecting the septum (Fig1- Fig2), causing significant tricuspid insufficiency (Fig3). The laboratory work-up was disturbed, with a severe infectious syndrome. The diagnosis of IE was made according to the Duke criteria. During her hospitalisation, the patient

received antibiotic treatment (TRT), which was initially empirical and then adapted according to the antibiogram. The germ identified was streptococcus viridens. The indication for urgent surgery on the tricuspid valve was retained, given the lack of response to ATB and, above all, the failure to reduce the size of the vegetation, which exceeded 25 mm. The surgical procedure consisted of a vegetectomy (Fig5) and a tricuspid plasty with excision of the infected tissue (Fig4). The procedure was successful, with post-operative echocardiography showing a residual grade I tricuspid leak (Fig6), with no recurrence of vegetation. The antibiotic treatment protocol was followed as recommended before and after the procedure.



Fig 1. TTE long-axis section of the right cavities shows vegetation of the anterior tricuspid valve.



Fig 2. TTE apical section of the 4 right cavities shows vegetation of the anterior tricuspid valve and the septal valve.

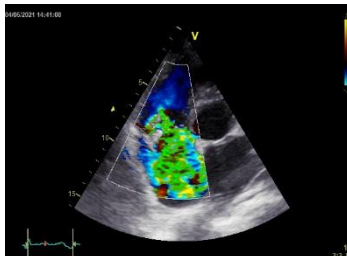


Fig 3. TTE apical section of the 4 cavities, colour Doppler shows a massive IT.



Fig 4. Intraoperative view of our patient's tricuspid vegetation.

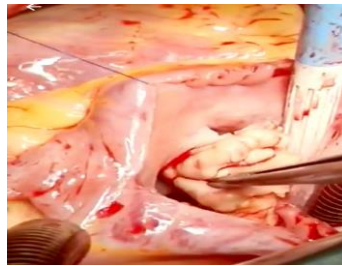


Fig 5. Surgical specimen of our patient's vegetation.

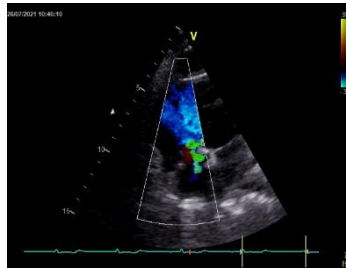


Fig 6. TTE apical section of the 4 cavities, colour Doppler shows residual grade 1 IT, on a good result of the tricuspid plasty.

Discussion

Rheumatic heart disease as the main factor predisposing to IE has been replaced by new groups of people at risk, including intravenous drug users, the elderly, wearers of intracardiac devices (pacemakers, defibrillators, valve prostheses), the immunocompromised, and nosocomial IE linked to medical care. Antibiotic treatment targeting the most likely germs should be initiated immediately after blood culture results suggestive of IE are obtained. When properly conducted, and in association with percutaneous (or surgical) removal of infected intra-cardiac devices [7], it enables this condition to be cured without recourse to surgery in 70 to 85% of cases [3, 4]. Due to the lack of clear recommendations regarding surgical indications and the small number of cases operated on, current recommendations vary. According to most studies, the indications can be summarised as follows [3, 5]: (a) Persistent infection that does not respond to antibiotic therapy beyond 2 weeks (b) Recurrent septic pulmonary emboli, confirmed by pulmonary angiography or CT scan; (c) Massive or worsening tricuspid regurgitation (> 2+/4+) contributing to deteriorating right (and subsequently left) ventricular failure ; (d) septic shock (indication for emergency intervention); (e) size of vegetation increases or persists > 1cm despite antibiotic therapy; (f) acute or worsening renal and/or hepatic failure of recent onset; (g) secondary right or left valvular disease (multi-valvular disease); and (h) failure or complications of percutaneous removal of infected intracardiac devices. The timing of surgical management depends on the following factors: (a) the cause of the endocarditis (pacemaker emergency, prosthesis), (b) the infectious factors involved (fungal, pseudomonas, SAMR...), (c) coexistence with a left IE, (e) response to antibiotic treatment, (f) antibiotic toxicity (renal and/or liver failure) and (g) complications of the disease (abscesses, increased size of vegetation...) [3]. Early surgical intervention should be considered if *S. aureus* is suspected because *S. aureus* infections are often complicated infections with large vegetations, aggressive valve destruction and embolic manifestations, leading to an increased risk of mortality [9]. The main principles of surgical management include [10]: (a) radical debridement of vegetations and infected tissue, (b) avoidance of prosthetic material, particularly in drug addicts, and (c) correction of tricuspid regurgitation. There are two

surgical techniques, the first known as "non-prosthetic" [11], involving either (a) complete removal of the existing vegetations (vegetectomy) or (b) complete removal of the valve leaflets and cords (valvectomy). Both are advantageous in drug addicts and should be considered in the first line of treatment, as drug addicts run a high risk of complications due to poor compliance with anticoagulant treatment and reinfection linked to resumption of drug use [10]. However, in the case of extensive lesion in more than one leaflet of the valve, repair is not possible and complete excision of the valve (valvectomy) should be considered [12]. The second technique, known as prosthetics, should be used in cases of significant regurgitation after repair or in cases of coexisting pulmonary hypertension. Tricuspid replacement is another surgical option, but a rare one. Using the repair techniques mentioned above, few cases of tricuspid endocarditis will require valve replacement, due to the good tolerance of moderate (<2+/4+) valve regurgitation by the right ventricle [13, 14]. The main drawback of prosthetic valve replacements is the high incidence of prosthesis-related complications, including reinfection, conduction disorders, prosthesis thrombosis and constrained haemodynamic performance [12]. However, in recent years the development of new valve prostheses has considerably improved the prognosis of patients after tricuspid valve replacement (fewer complications). Offering an additional therapeutic option in the most difficult cases.

Conclusion

Successful surgical treatment of tricuspid endocarditis must include excision of all infected tissue and restoration of valvular competence. Such a procedure allows complete removal of infected tissue and preservation of valve function. Tricuspid valve repair rather than replacement is indicated in cases of right-sided endocarditis involving a single tricuspid leaflet. It allows eradication of the infection without implantation of prosthetic material. Patients who undergo repair have better survival with no additional risk of re-intervention than those who undergo replacement. Repair should be considered whenever possible and as a first-line treatment for drug addicts.

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