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REVIEW ARTICLE

The Tricuspid Valve Reconstruction After Tricuspid Valve Endocarditis

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Abstract

Tricuspid valve infective endocarditis (TVIE) is a rare clinical condition. Thus, there is no common treatment option for TVIE. We present a successful result for TVIE. The surgical options for TVIE are Vegetectomy and valvulectomy, valve repair, which are controversial in regard to hemodynamic consequences in right-sided low-pressure system and long-term prognosis 31year old with TVIE coupled with ASD and our surgical strategy.

Keywords: Tricuspid valve reconstruction, Tricuspid valve endocarditis

Introduction

TVIE is a rare clinical condition with 5-10% of the infective endocarditis (Chan *et al.,* 1989). It is strongly associated with i.v. drug abuse or pacemaker infection. (Baraki *et al.,*2013). The three leaflets, cordae tendinae and two discrete papillary muscle, fibrous tricuspid annulus, the right atrial and ventricle myocardium collectively known as the tricuspid valve complex, the integrity and the coordination of these components involves the successful functioning of Tricuspid valve. Even though 75% of successful medical treatment of the TVIE was seen, in the remaining 25% were not recommended for the conservative treatment but with the surgical treatment (Chan *et al.,* 1989). We report on surgical case of TVIE with atrial septal defect.

Case Study

A 31 - year old male was diagnosed with Tricuspid valve Endocarditis and the atrial septum defect (ASD). Positive blood culture with *Streptococcus pneumonia* resistant to antibiotic was diagnosed; hence gentamicin and penicillin treatment was started. The coronary heart disease can be excluded in Cardiac catheterization. Based on the previous findings, the indication for combined cardiac surgery was made. No murmur was noticed at the apical area during examination and pathology was not noticed in heart, lung and skelet on Chest roentgenogram. Electrocardiogram result mitral and no aortic pathology was noted. Written informed consent was obtained from the patient and his family, and the patient was taken to the operating room for a corrective surgery.

Showed sinus rhythm and no evidence of myocardial ischemia. Echocardiography showed ejection fraction (EF) of 55%, severe tricuspid regurgitation with 2cm vegetation mid. Pressure gradient 35mmHg and atrial septum defect (Figure 1,2). Otherwise no.

After sterile washing and covering under general anaesthesia and Patient was placed in supine position, the median sternotomy was done. Non- magnified beating heart was seen in Sinus rhythm. Systematic administration of heparin with sufficient active clotting time (ACT <600) . Tabac stitches were placed for Cannula. The cannulation of the ascending aorta and bicaval venous drainage was performed. Thus extra corporeal circulation and total bypass was started. During inspection the heart contracted well in all section. After taking the enough volume from circulation the instillation of antegrade blood cardioplegia to the cross - clamped aorta was done . The heart came immadiatly to cardiologic arrest. After opening the right atrium the Atrial Septum Defect (ASD) was presented. In Tricuspid valve there was pronounced florid endocarditis with the plume size vegetation, which almost exhausted the entire anterior leaflet. The septal side is also affected and infected to whole extent whereas the posterior side is free from the growth. Thus all the vegetation on the anterior leaflet

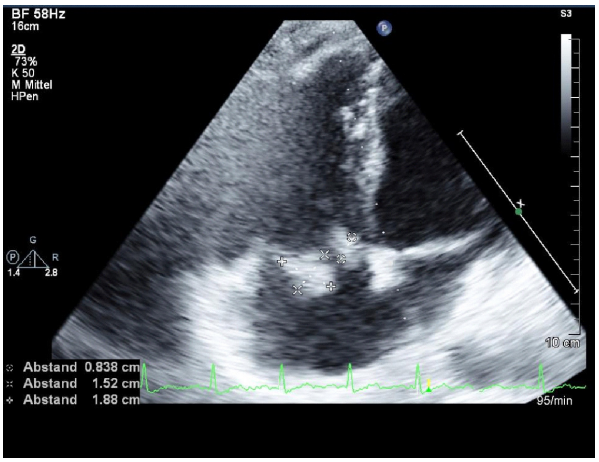

Figure 1

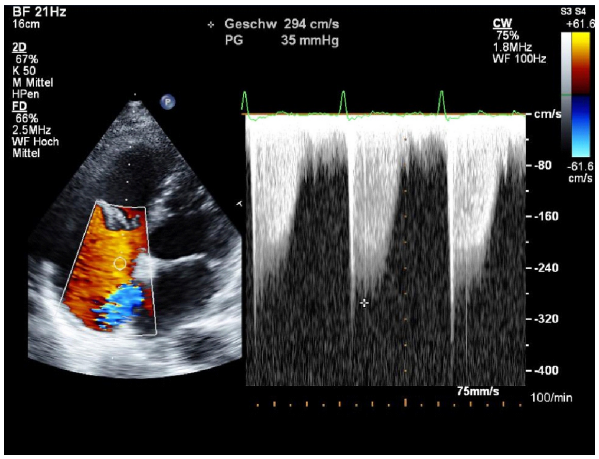

Figure 2

and on the septal leaflet was removed and washed with multiple washes of iodine. Now arises the question whether the primary valve to relplace or attempt to reconstruct the anterior leaflet with pericard and clear the septal leaflet. Then the surgical site would not completely restored in the surgical sense, but it would be stabile, the patient would probably have a normal life expectancy, which he will not have if primary implantation of bio prosthesis would be done. It was decided to reconstruct the anterior leaflet with pericardial patch, careful cleansing of the septal leaflet and proper implantation of a 32 contour annuloplasty ring. (Figure 3.) Test with water sample, residual TI I. After which the closure of ASD with a single side followed by the closure of the atrium by 4.0 Prolene.

By opening the Pulmonary artery and Pulmonary vein was inspected, which is free from any changes. PA is closed and aorta was declamped. The lowest core body temperature was recorded as 35.6°C, X – Clamp time of 52min, Perfusion time of 86 min and reperfusion time of 22 min. After a short reperfusion stable spontaneous rhythm with subsequent normalization of the ECG was

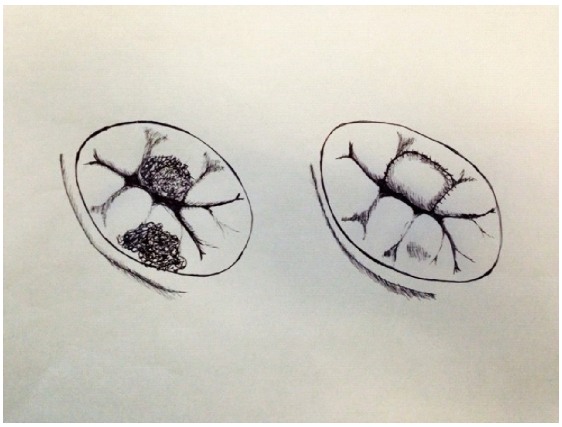

Figure 3

seen. Stitch of transient pacemaker wires was performed, heart was not stimulated. Complication-free weaning of extracorporeal circulation with the decannulation, sewing over the cannulation was done. Protamine was used to control the bleeding.

Intra operative TEE was seen the residual TI-I, TI-II, Hemodynamic CVP is 12 - 14mm Hg with a V wave of 4 mmHg. In functional terms, this result was acceptable. After the careful haemostasis, the pericardium was closed followed with the closures of the sternum with 6 wire cerclage, fascia, and subcutaneous skin sutures and sterile dressing. At the end of the operation the circuit conditions were stable without KA. Patient was transferred to the ICU for further treatment.

After 18 days of the surgery the transoesophagial echocardiography shows no evidence for endokarditis recidive,. low dehiscence between septal and the anterior tricuspid leaflet, TI I.-II °, p mean antegrade is 3 mmHg and PA sys. is normal.

Laboratory analysis shows (all data in SI units) hemoglobin 6.1, hematocrit 0.30, leukocytes 6.1, platelets 538, creatinine 58, urea 4.1, CRP 14.8.

Discussion

The treatment for TVIE usually performed in the left sided endocarditis. After the TVIE diagnosis, the medical treatment with antibiotic is indicated. Depending upon the patients' status, the medical treatment should be continued, until the sign of the infection disappeared for 4 – 6 weeks. The operative indications for TVIE in active stage are uncontrolled tricuspid regurgitation, pulmonary embolism and the presence of the mobile vegetation (Robbins *et al.,* 1986; Morokuma *et al.*, 2010). Early surgery should be considered in bacteremic and systemically infected patients on adequate medical therapy with isolated TVIE (Taghavi *et al., 2013*).

In surgical treatment for TVIE, a complete debridement of infected tissue including the tricuspid valve and a reduction of tricuspid regurgitation are important to prevent the

recurrence of endocarditis and right ventricular dysfunction after surgery. The surgical opinions are vegetectomy and valvulectomy, valve repair, and valve replacement as prescribed from the literature (Arbulu, *et al.,* 1991; Allen *et al.,* 1991; Gottardi, *et al.,* 2007; Morokuma *et al.,* 2010). In intravenous drug users these procedures are better than valve replacement (Lange *et al*., 1996). These opinions have the benefit of using no prosthetic material; rather they result in right ventricular dysfunction. This is because of massive TR after surgery and requires reoperation in more than 20% of patients (Robbins *et al.,* 1986). In 31 patients with tricuspid valve disease, the excellent long term outcomes with TVR were indicated and whose operative mortality was 6.5% (Tokunaga *et al.,* 2008). A similar case study was reported long term outcome for valve replacement in 346 patient infective endocarditis where 12% operative mortality Kaiser *et al.,* 2007). The medical reports related to the valve replacement for TVIE and its outcomes are very meager in number. A rare presentation of eyeball pulsation seen in the patient with Tricuspid regurgitation and cardiac failure (Chen & Jones, 2012) Couetile *et al*.,(2002) reported on the partial replacement using a mitral homograft.

There are some controversial questions which are not been completely answered which includes, is the valve replacement optimal treatment for TVIE patients? Is that the mechanical valves or biological valves are better in thrombosis / durability in the right sided low pressure system? (Morokuma *et al.,* 2010). Even though the operations are performed under the CPB as the stranded procedure, some TVIE patients are not tolerate because of the sever lung injury due to pulmonary embolism. In some specific circumstances off – pump tricuspid valve operation for TVIE should be considered (Lee *et al.,* 2007). To conclude the present case study the Tricuspid valve reconstruction is the most desirable surgical option for patients with TVIE and prognosis can be significantly improved by adequate antimicrobial therapy (Fayad *et al.,* 2014).

Conclusion

We reported a rare surgical case of TVIE combined with ASD in 31 year old male, the surgical opinion and the clinical outcomes. For surgical opinion in the patients with TVIE, the tricuspid valve reconstruction can be done safely with regard to recurrent endocarditis and valvular competence.

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