Aortic Valve Endocarditis Leading to Rupture of Sinus of Valsalva: Echocardiographic Diagnosis

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Abstract:
Aortic Valve Endocarditis Leading to Rupture of Sinus of Valsalva in the right-sided heart chambers is an unusual complication. Here we have presented a case where infective Endocarditis of Aortic Valve lead to Rupture of Sinus of Valsalva into the right atrium. Prolapsing vegetation also lead to a satellite lesion on tricuspid valve probably by direct implantation.

Echocardiography with color flow mapping helped us to diagnose this case early and accurately so that timely surgery could save patient's life.

Keyword: Infective endocarditis, Aortic Valve, Sinus of Valsalva.

Introduction:
Sinus of Valsalva fistulas to right chambers are an infrequent pathology in surgical series in Western countries (<0.02%) while their prevalence is much higher in Asian populations ranging from 0.96-1.5%[1]. A sinus of Valsalva fistula with left to right shunting from the aorta to the right atrium (RA) or right ventricle (RV) is an unusual complication of infective endocarditis (IE)[2]. A few case reports describing spread of infection from aortic valve to sinus of Valsalva ultimately leading to its rupture into cardiac chambers have been published[3,4].

In the past these fistula's have been detected only by angiography and have been definitely localized only at the time of surgery or postmortem examination[5], but now two dimensional echocardiography (2DE) with color flow mapping can reliably diagnose it as was seen in our case.

Case Report:
A 30-year-old Indian gentleman, who has been perfectly healthy and asymptomatic previously, was admitted with 2 months history of progressive shortness of breath ultimately leading to orthopnoea and paroxysmal nocturnal dyspnoea. He was also complaining of generalized weakness, easy fatigability, anorexia and weight loss. He also gave history of fever with chills and rigors on and off for the same duration with suspected respiratory tract infection. Seven days prior to his admission he also noticed abdominal fullness and increasing swelling of both lower limbs hence he sought medical advice.

Physical examination revealed a sick looking emaciated young male with marked pallor and bilateral pitting pedal edema. Jugular venous pressure was elevated with prominent V wave. Chest Examination revealed bibasilar crackles. Cardiovascular examination showed hyperdynamic cardiac pulsations.

Auscultation showed normal first heart sound,accentuated pulmonary component of second heart sound, a left ventricular gallop, a to-and-fro murmur at left lower sternal border with distinct second sound and a separate ejection systolic murmur at the aortic area. Per abdominal examination showed mild tender hepatomegaly but spleen was not palpable.

Laboratory investigations revealed microcytic hypochromic anemia, mild leucocytosis and elevated erythrocyte sedimentation rate. Blood cultures showed streptococcus viridans.

Echocardiography showed vegetation on the non-coronary cusp of a structurally normal tricuspid aortic valve (Figure 1). A fistulous tract was seen between aortic root and right atrium with freely mobile vegetation attached at its tip (Figure 2) Color and continuous wave Doppler interrogation showed a continuous flow across this fistula in to the right atrium (Figure 3). Moderate aortic regurgitation was also found.

Echo findings were confirmed during the operation and a rupture of non coronary sinus of Valsalva in to the right atrium was found along with vegetations on non and right coronary cusps of aortic valve which were prolapsing through the fistula in to the right atrium but no intrinsic pathology was noted for the aortic valve. A satellite lesion was also found on septal tricuspid leaflet Rupture of sinus of Valsalva was repaired with a pericardial patch, septal tricuspid vegetation was excised and leaflet repaired and aortic valve was replaced with Saint Jude valve.
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Figure 1: Parasternal long axis view showing vegetation on non-coronary cusp of aortic valve. Patient was started on appropriate antibiotics and anti-failure measures and was immediately referred for surgery, which was successfully done.

Figure 2: Parasternal short axis view at base showing a fistulous tract between root of aorta and right atrium with vegetation attached at its tip.

Figure 3: Parasternal short axis view at its base showing almost continuous flow between the aortic root and right atrium through the fistulous tract.

Discussion:

Infective endocarditis causing rupture of sinus of Valsalva leading to intracardiac shunt is an unusual complication\(^2\). The most frequent cause of sinus of Valsalva fistulas to right chambers is perforation of a congenital sinus of Valsalva aneurysm, but other causes have been described, including infections (endocarditis, luetic aortitis) and traumatic or iatrogenic dissection\(^7\).

Asin Cardiel et al. described one such case where sinus of Valsalva aneurysm ruptured into the right atrium secondary to aortic endocarditis, which was reliably diagnosed by echocardiography\(^3\). Yashikai et al. reported a case of rupture of sinus of Valsalva leading to tricuspid valve endocarditis\(^8\).

In our case also a small satellite lesion was found on tricuspid valve probably because of direct implantation by freely mobile vegetation seen attached to the tip of the fistulous tract on to the tricuspid valve which was missed on echocardiography.

McMahon et al., found echocardiographically four out of 90 patients with endocarditis to have rupture of sinus of Valsalva and concluded that in such cases infection with *streptococcus* species should be suspected as consistent with our case\(^8\).

Transesophageal echocardiography with color Doppler helped to diagnose our case early, and accurately, thus surgical intervention could be undertaken timely so as to save patient's life. Transesophageal echocardiography may be required in patient with poor echogenicity to depict cardiac structures optimally.

References:
