

## Pseudoaneurysm of Sinus of Valsalva Following Aortic Valve Replacement in Infective Endocarditis- A Delayed Clinical Presentation

Arif S<sup>1</sup>, Barua A<sup>1\*</sup>, Papaspyros S<sup>1</sup> and Regan DO<sup>1</sup>

<sup>1</sup>Department of Cardiac Surgery Leeds Teaching Hospitals NHS Foundation Trust, UK

\*Corresponding author: Anuapama Barua, Department of Adult Cardiac Surgery, Leeds General Infirmary Email address: abarua@doctors.org.uk

Received Date: Nov 10, 2019 Accepted Date: Dec 10, 2019 Published Date: Dec 21, 2019

### 1. Abstract

A 44 year old Caucasian male presented with progressive exertional dyspnoea two years following infective endocarditis treated by tissue aortic valve replacement and eradication of infection. Transoesophageal echocardiography and CT scan revealed pseudoaneurysm of sinus of valsalva above the prosthetic valve ring at right coronary sinus. This case report highlights the necessity of meticulous follow up after treatment of infective endocarditis even with prolonged antibiotics and surgical intervention.

**2. Keywords:** Infective endocarditis; Pseudoaneurysm; Sinus of valsalva

### 3. Introduction

Pseudoaneurysm of Sinus of Valsalva (SOV) is not common after infective endocarditis. It usually happens after left heart catheterization or chest trauma. Surgical excision is the main stay of treatment for symptomatic patients. Our patient developed pseudoaneurysm of SOV two years after treatment of infective endocarditis. This present case, however, emphasises the rigorous follow up of infective endocarditis patients for early diagnosis of this rare complication.

### 4. Case Report

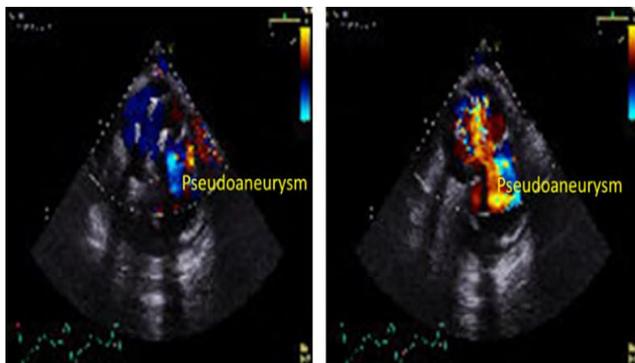
A 44 years old gentleman, IV drug abuser was transferred to our hospital from a peripheral hospital with cardiac failure as a result of severe aortic regurgitation secondary to infective endocarditis. He was admitted in peripheral hospital 14 days ago and was treated with antibiotics. He developed left sided weakness after admission & CT scan revealed ischaemic change in the right middle cerebral artery territory. Transoesophageal Echocardiogram (TTE) showed aortic valve endocarditis with

development of aortic root abscess. Blood results depicted white cell counts 19.40g/dl, neutrophil 17.60g/dl and no significant derangement in renal and liver function. He was taken to theatre for emergency aortic valve replacement. Aortic valve was tricuspid and was damaged by infection. A 2x2cm abscess cavity was identified on the non-coronary cusps site. Frank pus was sucked out and sent for culture & sensitivity. All the infected and inflammatory tissues were removed. The gap was closed with a 2.5x6cm pericardial patch. Annulus was measured and a 25mm Hancock porcine valve implanted. During the immediate postoperative period, underlying rhythm was complete heart block and permanent pacemaker was implanted by electro physiologist. Microbiology revealed that the necrotic tissue grew *Staphylococcus Aureus* for which he was treated with IV Flucloxacillin and IV Gentamycin for six weeks as advised by microbiologist. He was discharged seven weeks after admission and blood cultures were negative and all blood results normalised at the time of discharge.

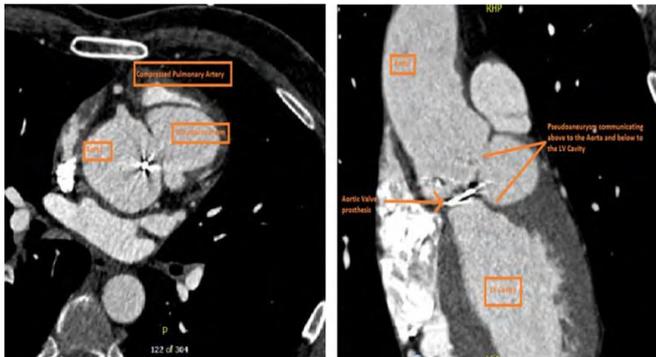
Two years after the surgery, he attended cardiology clinic with progressive dyspnoea on exertion leading to a situation where he can only walk up to 5 minutes before he feels limited and he did not develop peripheral oedema and on auscultation, continuous machinery murmur was present in the precordium radiating to carotid. His Transoesophageal Echocardiogram (TOE) showed well seated tissue AVR with good valve opening. Two eccentric paravalvular jets of aortic regurgitation appeared moderate in severity with a pressure half time of 300 ms. His left ventricle appeared borderline dilated with a cavity size of 59 mm with preserved left ventricular systolic function. A large pseudo-aneurysm in the right coronary sinus was identified compressing the RVOT (Figure 1). ECG gated CT of the heart performed that demonstrated localised 4 centimetre

out pouching structure from the wall of the aorta immediately above the valve ring (Figure 2). The trunk and branches of pulmonary artery, rest of the ascending aorta and arch of aorta looked normal.

It was discussed in local multi-disciplinary team meeting and the decision was made to do redo aortic valve replacement with reconstruction of the aortic root. Redo sternotomy was done in a standard way with aortic cannula, two stage right atrial cannula and right superior pulmonary vein vent. Oblique aortotomy was done and a pseudoaneurysm was noted at right coronary sinus cusps measuring 1.5cm orifice. Valve was explanted and pseudoaneurysm was excised with sharp dissection. A 25 mm mechanical valve was reimplemented with interrupted pledgeted stitches and unhealthy aorta was reconstructed with pericardial patch. Postoperative TOE showed well seated aortic valve with no evidence of residual pseudoaneurysm or aorto-LV fistula. Now cardiologist is following up the patient and he is also managed by drug-addiction team. Last TTE, one year following redo surgery did not reveal any relapse of infection.



**Figure 1.** Transthoracic echo demonstrating the pseudoaneurysm in sinus of Valsalva with implanted valve



**Figure 2.** CT demonstrating the pseudoaneurysm in sinus of Valsalva with im- planted valve

## 5. Discussion

Pseudoaneurysm of SOV following infective endocarditis is a catastrophic complication. It is reported in literature to occur up to of 28% infective endocarditis patients [1]. Pseudoaneurysm of SOV affect most commonly right coronary sinus as high as 80%, LCS involvement as low as 4% [2, 3]. In our case, it developed in RCS two years after replacement of

aortic valve and excision of abscess cavity with completion of antibiotics. AHA& ESC guidelines recommended TOE should be performed if TTE is non-diagnostic or clinical suspicion of recurrent IE [4, 5]. In our case, patient was clinically deteriorating and TTE was inconclusive. We also performed TOE and CT aorta for evaluation of aortic anatomy. AHA & ESC guidelines proposed CT aorta to evaluate the complication of IE, to detect the pseudoaneurysm and to assess the extent of perivalvular complication [4, 5].

Pseudoaneurysm of SOV is a challenging surgical procedure due to fragile tissue and significant anatomical distortion. New valve was implanted in the supra annular position with removal of previously implanted tissue valve. The pseudoaneurysm was excised and unhealthy aortic tissue was reconstructed with bovine pericardial patch used as reinforcement.

It is worthy to mention that meticulous post up follow up for identifying the early or late deterioration of the patient, for detecting the sequel of IE , recurrence of infection, valvular dysfunction and heart failure is warranted for early diagnosis.

## References

1. Arnett EN, Roberts WC. Valve ring abscess in active infective endocarditis. Frequency, location, and clues to clinical diagnosis from the study of 95 necropsy patients. *Circulation*. 1976; 54: 140-5.
2. Kanemitsu S, Tanabe S, Ohue K, Miyagawa H, Miyake Y, Okabe M. Aortic valve destruction and pseudoaneurysm of the sinus of Valsalva associated with infective endocarditis. *Ann ThoracCardiovasc Surg*. 2010;16: 142-4.
3. Lee CC, Siegel RJ. Sinus of Valsalva Pseudoaneurysm as a Sequela to Infective Endocarditis. *Tex Heart Inst J*. 2016 Feb; 43: 46-8.
4. Pettersson GB, Coselli JS, Hussain ST, Griffin B, Blackstone EH, Gordon SM, et al. 2016 The American Association for Thoracic Surgery (AATS) consensus guidelines: Surgical treatment of infective endocarditis: Executive summary. *J ThoracCardiovasc Surg*. 2017; 153: 1241-58.e29.
5. Murphy DJ, Din M, Hage FG, Reyes E. Guidelines in review: Comparison of ESC and AHA guidance for the diagnosis and management of infective endocarditis in adults. *J NuclCardiol*. 2019; 26: 303-8.