

## RUPTURE OF SINUSES OF VALSALVA ANEURYSM PRESENTING AS CHRONIC HEART FAILURE - TWO CASE REPORT

Soma Saha<sup>1</sup>, Avik Chakraborty<sup>2</sup>

<sup>1</sup>Assistant Professor, Department of Medicine, Tripura Medical College & Dr. BRAM Teaching Hospital, Hapania, Agartala.

<sup>2</sup>Associate Professor, Department of Medicine, Tripura Medical College & Dr. BRAM Teaching Hospital, Hapania, Agartala.

### ABSTRACT

#### INTRODUCTION

Ruptured sinuses of valsalva aneurysm (RSVA) are a rare entity with varied clinical presentation, one of the rare complications is chronic heart failure.<sup>1</sup> Here we describe two cases of RSVA of right coronary sinus ruptured into right ventricle presented with features of right heart failure.

#### CASE 1

35-year-old male with low-effort dyspnoea, nocturnal paroxysmal dyspnoea, orthopnoea, continuous murmur in left 3<sup>rd</sup> ICS, hepatomegaly and edema of the lower extremities.

#### CASE 2

30-year-old female with dyspnoea on exertion NYHA class II-III, nocturnal paroxysmal dyspnoea, orthopnoea, diastolic murmur, congestive hepatic insufficiency, peripheral oedema diagnosed by trans thoracic Echocardiography.

#### KEYWORDS

Trans Thoracic Echocardiography, Ruptured Sinuses of Valsalva Aneurysm (RSVA), Chronic Heart Failure.

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**INTRODUCTION:** The sinus of Valsalva aneurysm (SVA) is a small dilatation caused by a separation between the aortic media and annulus fibrosus.<sup>2</sup> Its origin may be either acquired or congenital. The right coronary sinus is most frequently affected, with the most

Common complication being rupture may lead to acute cardiogenic shock to death or chronic heart failure.<sup>3,4</sup> Echocardiography has become the definitive investigative tool not only to define and diagnose the lesion but also to quantify its severity.<sup>5,6</sup> Thus we report two cases of RSVA presented with chronic heart failure.

#### CASE REPORT:

**Case 1:** 35-year-old male referred from surgical OPD for pre anesthetic fitness for his inguinal hernia surgery. He was suffering from dyspnoea on exertion NYHA Class II to III and orthopnoea of last 8 month duration. He was a smoker 20 pack year of last 15 year duration.

Physical examination revealed, a normal stature (162 cm of height, 60 kg weight. JVP was raised 12 cm of blood with prominent VY descent, with pitting type bipedal edema. He had congestive hepatomegaly of 4cms and positive hepato jugular reflux.

On Precordial examination, a systolic and diastolic thrill was palpable in left parasternal area (PSA). A continuous murmur of grade 4/6 was audible in left 3<sup>rd</sup> ICS.

Lab Examination Reveals Hb(13gm%), TLC(9800), DLC(N-72, L-24), ESR 15, PBS-Normochromic normocytic RBC, Serum AST(15IU/L), ALT(20IU/L), Bilirubin(0.9mg/dl), Alkaline phosphatase 26IU/L, Urea(23mg/dl), Creatinine (0.7mg/dl), Sodium 135 meq/l, Potassium 4.1meq/l, FBS 78 gm%, HBsAg, Anti HBC, HIVI & II were negative. Urine routine and microscopy was within normal rang. ECG showed Normal sinus rhythm with Sinus tachycardia. Chest X-ray PA view revealed Cardiomegaly and Hilar congestion.

Echocardiography with colour Doppler study revealed normal LA & LV, normal all cardiac valves, Intact Inter atrial (IAS) & Interventricular septum (IVS) were intact, Right ventricular dilatation, no regional wall motion abnormality no regional wall motion abnormality. Aneurismal dilatation of right coronary sinuses of Valsalva and a small rupture into the right ventricle producing left to right shunt with a peak gradient (PG) of 55 mmHg across the shunt was found. There was also mild TR with Peak PG 28mmHg. (Figure 1, 2, 3,) Photograph in legend.

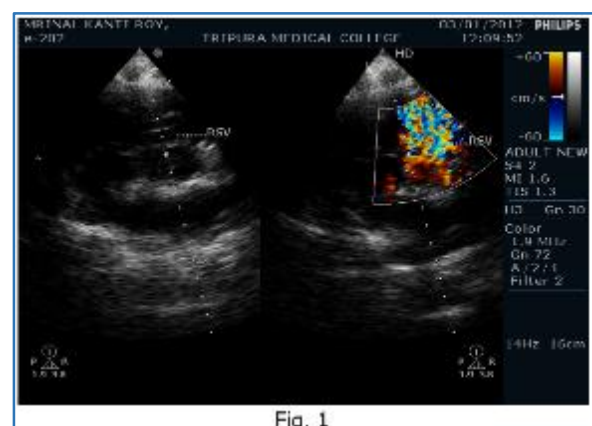


Fig. 1

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Corresponding Author:

Dr. Avik Chakraborty,

TMC & Dr. BRAM Teaching Hospital,

Hapania, Agartala.

E-mail: dravik1975@gmail.com

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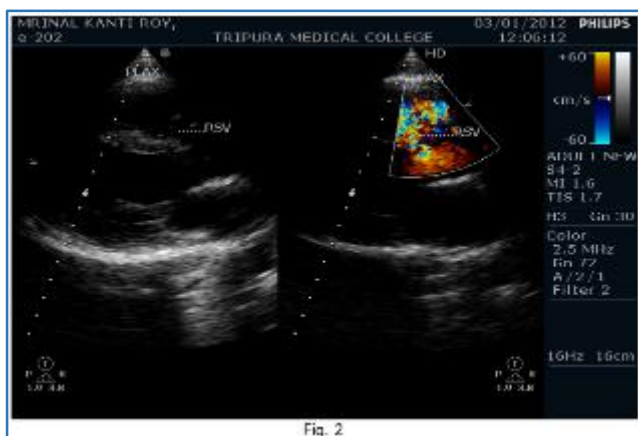


Fig. 2

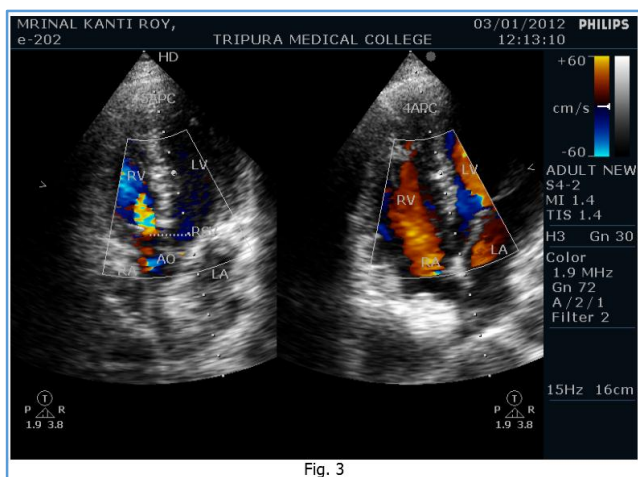


Fig. 3

**Case 2:** 30-year-old female with gradually progressive dyspnoea on exertion NYHA Class II–III for last one year, Shortness of breath initially started abruptly after a heavy physical exertion. She was treated with diuretics in her village for 4 month by local general practitioner. She left treatment for last three months and presented to us with dyspnoea NYHA class III-IV, orthopnoea and peripheral edema.

Physical examination reveals normal stature, 152cm of height, 53 kg weight. Pulse-106 bpm (Regular), all four limb peripheral synchronization, Blood pressure 130/60mm Hg, raised jugular venous pressure (JVP) 14 cm of blood with V wave, tender hepatomegaly of 5cm and peripheral pitting edema. On palpation, there is systolic and diastolic thrill in left parasternal area. A continuous murmur of grade 4/6 at the left sternal edge in 3<sup>rd</sup> and 4<sup>th</sup> ICS was heard.

Lab examination reveals Hb (10gm%), ESR 20mm, PBS( normochromic normocytic RBC) Serum AST(110IU/L), ALT(132IU/L), Bilirubin(1.0mg/dl), Alkaline phosphatase 350IU/L,Urea 28mg/dl, Creatinine(0.9mg/dl), Sodium 132 meq/l, Potassium 3.6meq/l, Magnesium 2.1meq/L, FBS 90gm%, HBsAg, Anti HCV, and HIV I & II were negative. Urine routine and microscopy was within normal range. Blood culture of 3 sets taken from three different sites was negative for any bacterial growth.

ECG showed normal sinus rhythm, normal axis and sinus tachycardia. CXR PA view revealed Cardiomegaly

and Hilar congestion. Trans thoracic two dimensional colour Doppler echocardiography (TTE) showed normal LA and LV, dilated right atrium and right ventricle, morphologically normal cardiac valves, intact IAS & IVS. An aneurismal dilatation of right coronary sinus of Valsalva with rupture into the right ventricular out flow tract. RVOT pressure gradient was 42mmHg. Colour flow revealed left to right shunt. Mild AR peak PG 30mm Hg. There was no evidence of vegetation. (Figure 4) Photograph in legend.

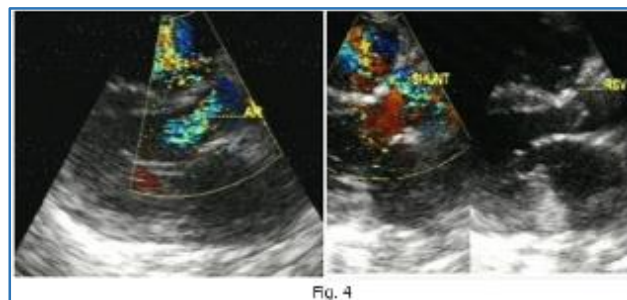


Fig. 4

Both of the two cases were managed conservatively with diuretics, digoxin and other ant failure treatment. Later on they were referred to cardiothoracic center for repair of ruptured sinuses of Valsalva.

**DISCUSSION:** Aneurysm of the sinus of Valsalva is a rare congenital anomaly that usually involves the right coronary sinus (76.8%), the non-coronary sinus (20.2%) or the left coronary sinus (3.0%).<sup>7</sup> The male-to-female ratio is 3.5:1 and symptoms usually develop in the adult population.<sup>4</sup> Rupture usually occurs into the right atrium or ventricle, but rupture to the left ventricle, pericardium, superior vena cava or pulmonary artery has also been described.<sup>8</sup> Chu et al reported that the incidence of ruptured SVA is five times higher in Asian countries (0.46-3.5% in Eastern and 0.14-0.23% in Western areas),<sup>9,10</sup> Diagnosis can occur at any age (average: 39 years old, range: 2-74 years). SVA affect the right sinus in 65-86% of cases, non-coronary sinus in 10-30% and the left sinus in 2-5%. The frequency of ruptured SVA varies according to the location, 60% in the right sinus, 42% in the non-coronary sinus and only 10% in the left sinus.<sup>11</sup>In our both case right coronary sinuses were involved. Rupture may be spontaneous, after trauma, extreme physical exercise or due to endocarditis.<sup>12</sup>

In our second case the ruptured might be occurred after a heavy physical exertion. Physiopathological consequences of SVA rupture depend on the volume of flow through communication, velocity of establishment of the rupture and cardiac chamber with which it communicates. SVA rupture causes thoracic pain, dyspnoea, cough, fatigue, tachycardia, or peripheral oedema, as well as a continuous murmur. The intact SVA may be asymptomatic, produce thrombus or distortion and compression of the coronary arteries, leading to ischemia.<sup>13</sup> The perforation of acutely high flow does not allow hemodynamic compensation, developing a sudden Cardiac failure.<sup>14</sup> In our second case patient developed

acute cardiac de-compensation after physical exertion and she was initially managed conservatively with heart failure treatment without knowing the cause. Subsequently after echocardiography at our centre we diagnosed her as a case of rupture of sinuses of Valsalva aneurysm (figure in legends 4). A small, gradual and progressive perforation can be tolerated temporarily, occurring in 25% of cases. As in our first cases who has presented with feature of congestive cardiac failure during his pre anaesthetic check-up for cardiological fitness. Subsequently after Echocardiography he is diagnosed as a case of right coronary sinus of Valsalva aneurysm and a fistula to the RV. (Figure in legends). At presentation, he displayed chronic heart failure symptoms with sub-acute worsening.

We performed his ECHO and wish to report these two cases since a limited number of patients have been reported with as long productive lives after rupture of sinus of valsalva into right ventricle. Whereas, in most cases this illness is known to proceed quickly to decompensated failure, there are a very few reports of prolonged survival. Chojnacki<sup>1</sup> reported a case who underwent surgery after 15 years of detection. The first reported case of RSOV diagnosed by echocardiography was in 1974,<sup>15</sup> the gold standard for diagnosis of this lesion has traditionally been cardiac catheterization and aortography. With the advent of newer generation ultrasound machines, transthoracic echocardiography and now trans oesophageal echocardiography (TEE) have taken centerstage for diagnosis.<sup>16</sup>

**CONCLUSION:** Though rare RSOV should be considered in patient presenting as chronic heart failure without any other predisposing factors. RSOV may have varied presentation that sometimes can be fatal if not diagnosed quickly. Right coronary sinus of valsalva to right ventricle ruptures are the commonest type of RSOV. Echocardiography is an accurate and reliable noninvasive tool to diagnose the lesion and obviates the need for cardiac catheterization in most cases.

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