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RUPTURED SINUS OF VALSALVA ANEURYSM (SOVA) – A CASE REPORT

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Introduction

Sinus of Valsalva aneurysm (SOVA) is defined as rare defects of the aortic root located between the aortic valve annulus and sinotubular junction, caused by aortic wall weakness, which has potential for spontaneous rupture.[1] Ruptured SOVA can present as a clinical emergency because of formation of aortic-cardiac shunting, which can rapidly affect the hemodynamic status. An early transthoracic echocardiography (TTE) and/or transesophageal echocardiography (TEE) may aid in early detection of such catastrophic illness.

Case Report

29-year-old lady with no known medical illness brought to emergency department with complaints of chest discomfort, palpitation and shortness of breath started 3 hours prior to her presentation. Otherwise, she had been unwell for 5 days with cough for 5 days and feverish for 2 days. Upon assessment, she was tachycardic with heart rate of 130bpm and blood pressure of 125/53mmHg. On auscultation, the team able to appreciate continuous murmur at the 3rd parasternal left intercostal space.

While being observed in ED, she became more restless and was subsequently intubated. Electrocardiogram (ECG) done showed sinus tachycardia with ST-elevation in leads II and aVF; ST-depression in leads V4-V6. Bedside transthoracic echocardiography done shows suspicious turbulent flow located at the aortic root into right ventricle, thus proceeded for TEE and showed evidence of ruptured SOVA. She was then stabilized and immediately referred to cardiothoracic center.

Figure 1: Electrocardiogram showing sinus tachycardia with ischemic changes over the infero-lateral leads with reciprocal changes.

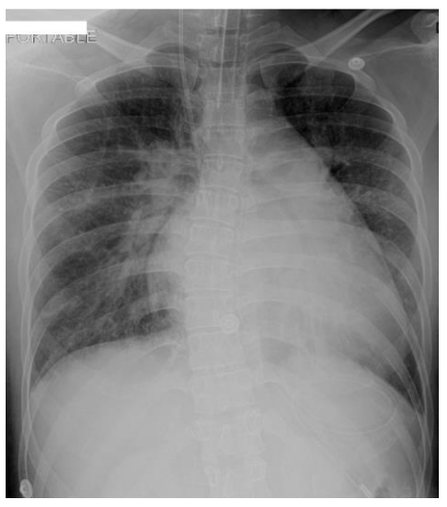

Figure 2: Chest X-ray of the patient showing cardiomegaly and haziness in the right lower lobe. Endotracheal tube and central venous line are in-situ.

Discussion/ conclusion

Although its rare, ruptured SOVA remain one of true emergency presentation in emergency department. A high index of suspicion in emergency for any patient with chest pain and continuous murmur is important. There is a case study reported that a ruptured SOVA patient presented with acute coronary syndrome (ACS) symptoms with significant ischemic changes in ECG, which mirrors the presentation of patient in discussion.[2] There are also significant scientific literatures highlighting the superiority of TEE over TTE in the diagnosis of ruptured SOVA.[1, 3] However, there were incidences of ruptured SOVA being misdiagnosed as ventricular septal defect by TTE and discussion has concluded that TEE is mandatory to accurately diagnose a ruptured SOVA.[4]

Windsock deformity seen from the mid-esophageal (ME) 5 chamber view also increase the likelihood of diagnosis of ruptured SOVA.[1] In this case, we were able to suspect the pathology with TTE and proceeded for TEE and showed a continuous left-to-right shunt in the ME long axis 2D (LAX) view with color doppler. We were able to appreciate a rare but classical finding of SOVA which is windsock deformity in ME LAX view and ME right ventricular (RV) inflow- outflow view in TEE.

The prevalence of developing left-to-right shunt into right ventricle in ruptured SOVA is high as 77.8% of SOVA originated from right coronary ostia, as compared to 19.3% originated from non-coronary sinus; 2.4 % originated from multiple coronary sinus; 0.5% originated from left coronary sinus.[5]

Early suspicion and diagnosis if important to proceed for management of ruptured SOVA in order to provide better outcome. As evidenced in one of the scientific literatures, early aggressive treatment is recommended to prevent complications which require more extensive repair.[6]

In conclusion, ruptured SOVA is a relatively rare disorder. Presentation can range from asymptomatic continuous murmur to a fatal cardiogenic shock. TTE plays an important role in the diagnosis of ruptured SOVA.

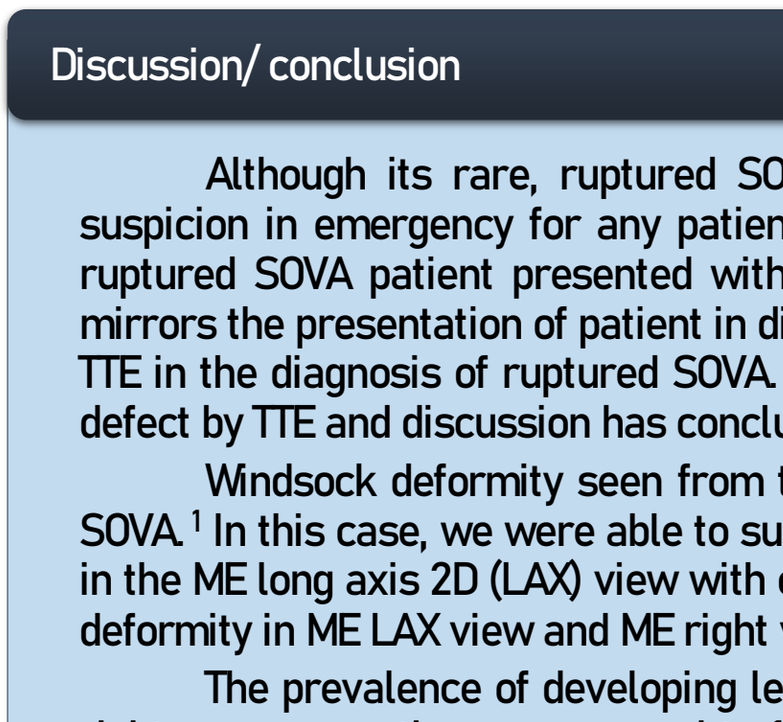

Figure 3: Mid-esophageal (ME) long axis 2D (LAX) view with color-flow Doppler in TEE revealing turbulent flow from sinus of Valsalva to the right ventricle. LA, Left atrium; LV, Left ventricle; Ao, Aorta; RV, Right ventricle.

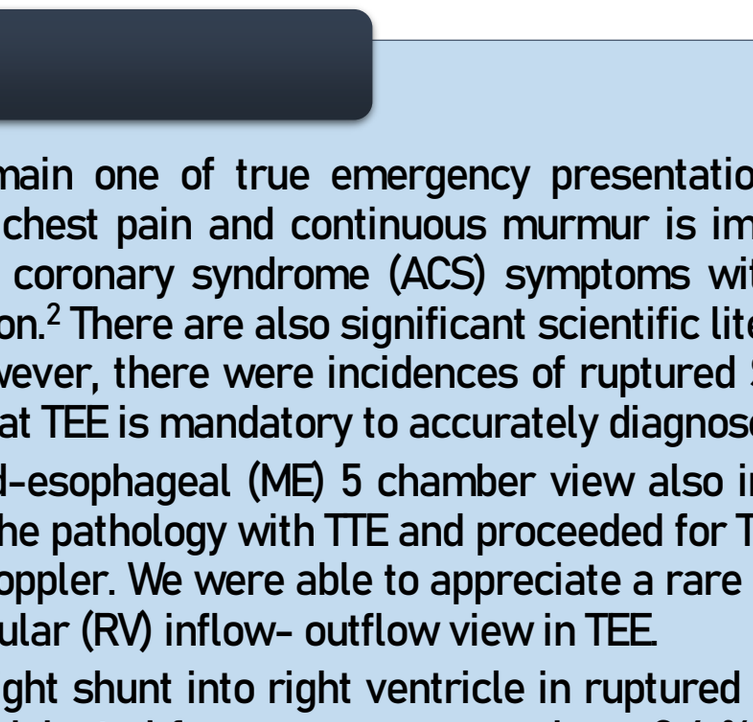

Figure 4: Mid-esophageal (ME) long axis 2D (LAX) view in TEE revealing windsock deformity. LA, Left atrium; LV, Left ventricle; SoV, Sinus of Valsalva; RV, Right ventricle.

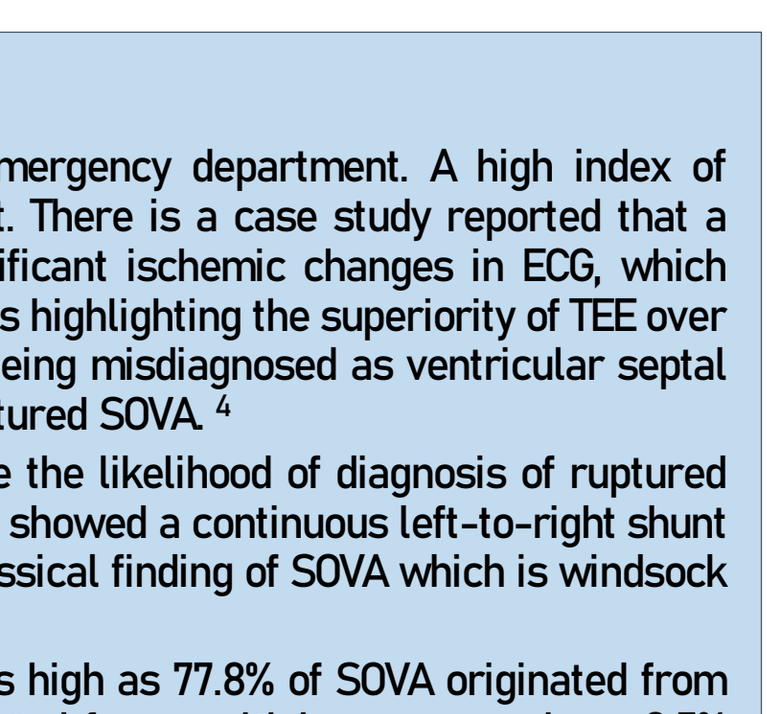

Figure 5: Mid-esophageal (ME) right ventricular (RV) inflow-outflow view in TEE revealing windsock deformity. LA, Left atrium; RA, Right atrium; Ao, Aorta; RV, Right ventricle; RVOT, Right ventricular outflow tract.

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Declaration of conflict for all author

No conflicts of interest.

References

1. Jain PK, Narula J, Hasija S, Kiran U. Is it really ruptured sinus of valsalva? The crucial role of comprehensive transesophageal echocardiography in clinical decision-making. *Ann Card Anaesth*. 2015;18(2):221-224. doi:10.4103/0971-9784.154475
2. Huang SW, Lo CH, Tsai CF, Su CH. Ruptured Sinus of Valsalva Aneurysm Presenting as Acute Coronary Syndrome with Cardiogenic Shock and aVR ST-Elevation - A Case Report. *Acta Cardiol Sin*. 2020;36(1):76-80. doi:10.6515/ACS.202001_36(1).20190731A
3. Harendra A, and Priya A. Kumar. 2020. "Ruptured Sinus of Valsalva Aneurysms: Does Transesophageal Echocardiography Have a Role in the Era of Sophisticated Cardiac Imaging?" *Journal of Cardiothoracic and Vascular Anesthesia* 34(12):3382–84.
4. Moarref AR, Afifi S, Jannati M, Rezaian GR. Ruptured sinus of Valsalva aneurysm initially misdiagnosed as ventricular septal defect by echocardiography. *Iran Cardiovasc Res J* 2009;3(2):123–5.
5. Cheng TO, Yang YL, Xie MX, et al. Echocardiographic diagnosis of sinus of Valsalva aneurysm: A 17-year (1995-2012) experience of 212 surgically treated patients from one single medical center in China. Int J Cardiol 2014;173:33–9.
6. Takach TJ, Reul GJ, Duncan JM, et al. Sinus of Valsalva aneurysm or fistula: management and outcome. *Ann Thorac Surg*. 1999;68(5):1573-1577. doi:10.1016/s0003-4975(99)01045-0