



Research Article

Giant Left Sinus of Valsalva Aneurysm with the Occlusion of Left Coronary Ostia in a Syphilitic: A Case Report

Bian Longrong¹, Cui Ying², Wu Zhong^{1,*}

¹Department of Cardiovascular Surgery, West China Hospital, Sichuan University, Chengdu, China

²Department of Anesthesia, West China Hospital, Sichuan University, Chengdu, China

Abstract

Background: Sinus of Valsalva aneurysm (SVA) is a rare anomaly that can be congenital or acquired. Left SVA is an extremely rare condition. Acquired SVA is often associated with infectious aetiologies, including syphilis, bacterial endocarditis, and tuberculosis. We report a rare case of giant left sinus of Valsalva aneurysm with the occlusion of left coronary ostia in a 28-year-old male patient with syphilis. **Case presentation:** A 28-year-old man present with a 6-month history of chest pain and heart failure. The imaging examination revealed the giant aneurysm originated from the left sinus of Valsalva, but the left coronary artery did not show. In addition, the patient had active syphilis and was being treated with penicillin. The patient was referred for surgery, Bentall procedure was completed with a single anastomosed right coronary artery. Intraoperative observations and pathological examination supported the diagnosis of cardiovascular syphilis. The patient recovered uneventfully and discharged 9 days later. At 36 months of follow-up, there were no coronary events or prosthesis dysfunction. **Conclusion:** Syphilitic cardiovascular disease included syphilitic aortitis, aortic aneurysms, aortic regurgitation and coronary ostial stenosis, and gummatous myocarditis. The diagnosis of this disease requires a combination of clinical symptoms, imaging examinations and pathological results. Surgery and penicillin are effective treatment options.

Keywords

Sleft Sinus of Valsalva Aneurysm, Occlusion of Left Coronary Ostia, Cardiovascular Syphilis

1. Introduction

Sinus of Valsalva aneurysm (SVA) is a rare anomaly that can be congenital or acquired [1]. Left SVA is an extremely rare condition. Acquired SVA is often associated with infectious aetiologies, like syphilis. We first report a rare case of giant left sinus of Valsalva aneurysm with the occlusion of left coronary ostia in a 28-year-old male patient with syphilis, and describe the correlation among echocardiographic, computed

tomography angiographic, intraoperative, and histologic imaging.

2. Case Presentation

A 28-year-old man present with a 6-month history of chest pain and heart failure was referred to our center. The patient

*Correspondence: Wu Zhong (wuzhong71@scu.edu.cn)



cannot recumbent when he arrived at the hospital. The electrocardiogram was normal (Figure 1A) and physical examination detected a diastolic murmur at the left sternal area cross with the second and third intercostal space. Laboratory tests on admission showed the level of CK-MB (1.24 ng/mL; RV<4.94 ng/mL) was normal, slightly increase of T troponin (37 pg/mL; RV<14 pg/mL), and NT-proBNP (10928ng/L; RV<88ng/L) increase remarkably. The echocardiography showed a giant aneurysm (65*55mm) originated from the left coronary sinus with severe aortic regurgitation (Figure 1B and

1C). Moreover, computed tomography angiography (CTA) revealed the huge unruptured sinus of Valsalva aneurysm and thickening of aortic wall, but the left coronary artery did not show (Figure 1D and 1E). There was no evidence of any fistulous communication between the aneurysm and any cardiac chambers. In addition, the patient had active syphilis, the serological test showed TRUST was reagent in high titers of 1:16 and TPPA was positive, and was being treated with crystalline penicillin.

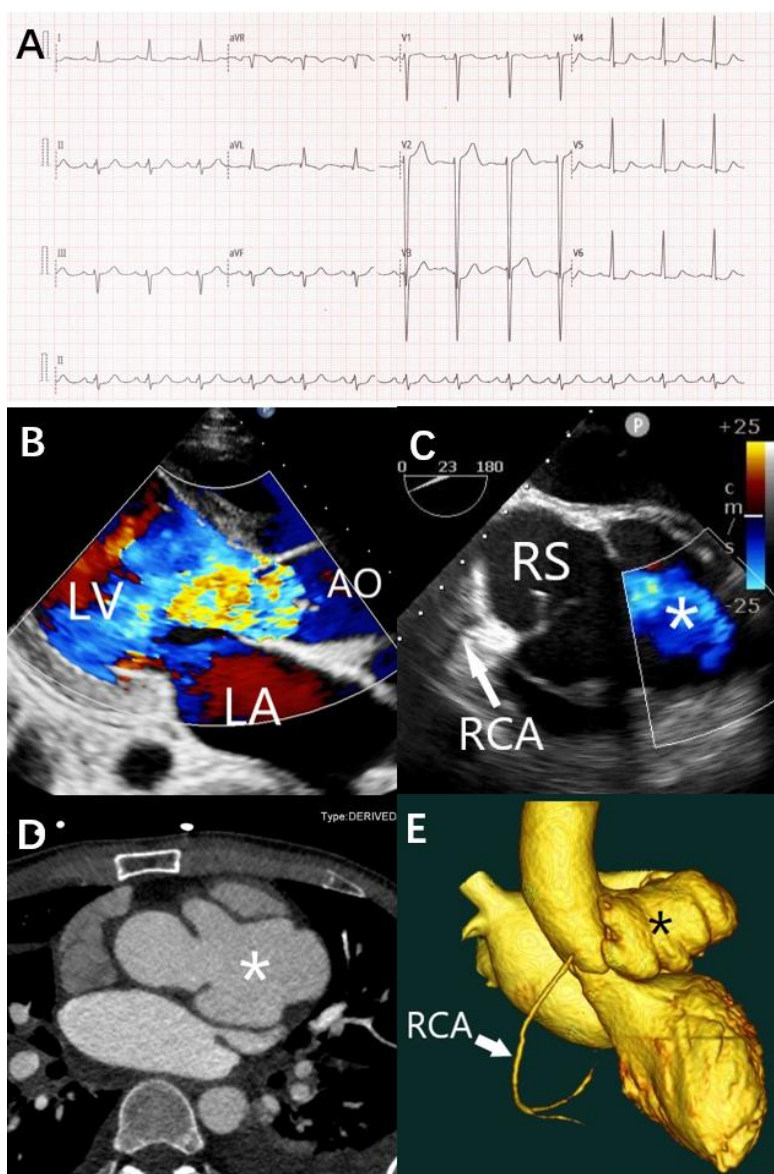


Figure 1. Preoperative examination.

A: electrocardiography showed normal sinus rhythm without any ST changes. B and C: echocardiography showed a giant unruptured left SVA (*thrombus) with severe aortic regurgitation. D and E: CTA and 3-dimensional reconstruction showed the giant left SVA (*thrombus) and RCA, but the left coronary artery did not show.

Surgery was performed later and confirmed the morphology of aneurysm, obviously and diffusely thickened aortic

wall, the opening of right coronary artery (RCA), and total occlusion of the left coronary ostia (Figure 2A and 2B). Bentall

procedure was completed with a single anastomosed right coronary artery. The aneurysm did not remove but was separated from the aorta by artificial blood vessels (Figure 2C).

The postoperative coronary angiography (CAG) revealed distal anterior descending and circumflex arteries were visualized via collaterals from the dilated right coronary artery

(Figure 2D).

Histologic examination of the aortic wall harvested at the procedure showed adventitia markedly thickened and fibrotic, and contained several collections of plasmacytes and lymphocytes, consistent with the manifestations of syphilitic aortitis (Figure 2E and 2F).

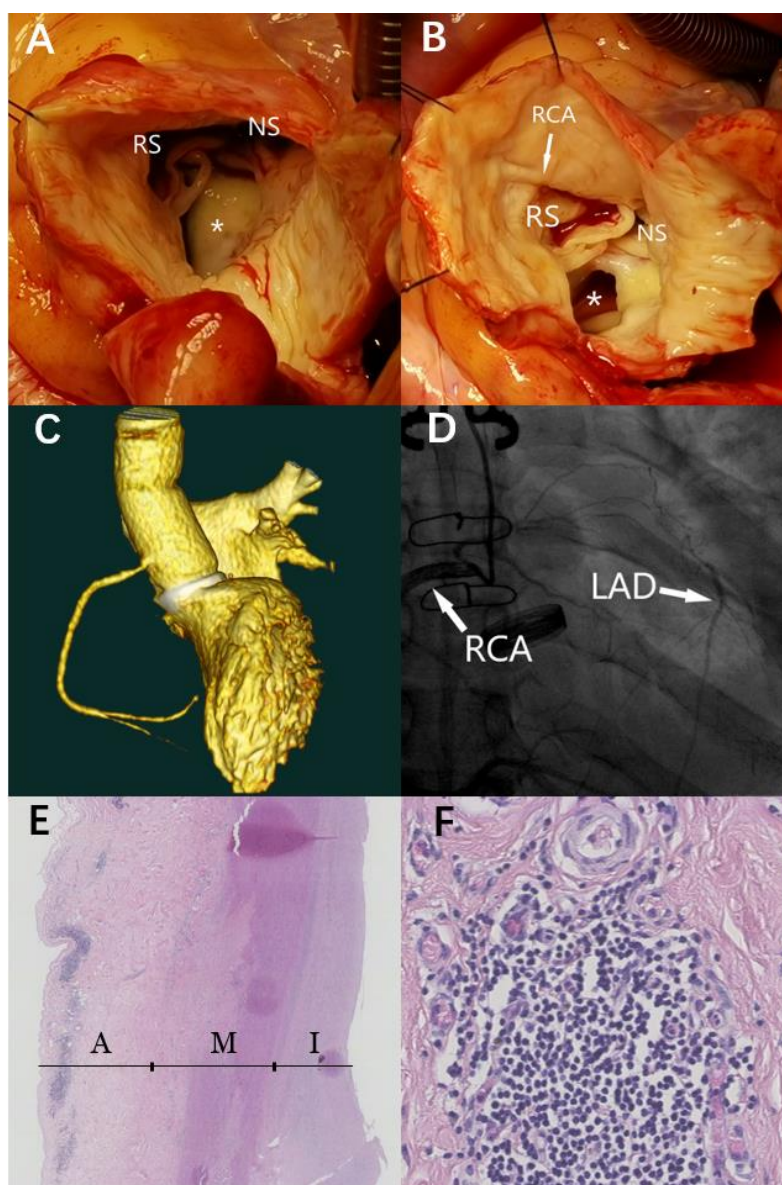


Figure 2. Intraoperative photographs and postoperative examinations.

A and B: Intraoperative photos revealed the morphology of aneurysm (*thrombus), and the opening of RCA. C: Postoperative CTA showed the SVA was disappeared and Bentall procedure was completed with single anastomosed RCA. D: Postoperative coronary angiography revealed the abundant collateral circulation between the LAD and dilated RCA. E and F: Histologic examination showed adventitia markedly thickened and fibrotic, and contained several collections of plasmacytes and lymphocytes. (Hematoxylin and eosin stain).

The patient recovered uneventfully and discharged 9 days later. At 36 months of follow-up, there were no coronary events or prosthesis dysfunction.

3. Discussion

SVA is a rare disease, with an incidence of 0.09% in the general population. Sinus of Valsalva aneurysm arises from

the right coronary sinus in 70% of patients, the non-coronary sinus in 25% of patients, and the left coronary sinus in 5% of patients [1, 2]. Sinus of Valsalva aneurysm can be either congenital or acquired [3]. Congenital SVA is thought to be linked to connective tissue diseases, such as Marfan's syndrome and Ehlers–Danlos syndrome. Acquired SVA is often associated with infectious aetiologies, including syphilis, bacterial endocarditis, and tuberculosis [4].

We were the first report to describe a giant left sinus of Valsalva aneurysm with the occlusion of left coronary ostia. In the present case, the presence of an ostial lesion on coronary angiography has raised a suspicion of syphilitic aortitis in a patient without risk factors for atherosclerotic coronary disease. Syphilitic cardiovascular disease included syphilitic aortitis, aortic aneurysms, aortic regurgitation and coronary ostial stenosis, and gummatous myocarditis [5]. About 26% of patients with syphilitic aortitis have coronary artery involvement [6]. However, it is very rare the total occlusion of left coronary ostia in our case. Although the patient denied having sexually transmitted diseases, the diagnosis of syphilitic aortitis was made due to the presence of high titers of TRUST (1:16) and positive TPPA, besides angiographic and histopathologic findings compatible with the disease [7]. For asymptomatic aortic lesions, routine cerebrospinal fluid screening is necessary to rule out neurosyphilis. In advanced syphilis, there may be a decline in serological titers and false-negative results of the "pre-penetrating band" phenomenon. Therefore, pathological diagnosis must be relied upon for confirmation [8, 9]. In some cases, Standardized penicillin treatment combined with surgical procedures can reduce the long-term mortality rate by 47% [10].

The involvement of the ascending aorta in present case was diffuse. Histologically, all 3 layers of the aorta were involved. The adventitia was thickened mainly by fibrous tissue and contained several collections of plasmacytes and lymphocytes. The medial smooth muscle cells were also replaced by fibrous tissue. The intima was thickened by what appeared to be typical atherosclerotic plaque. All above were consistent with the manifestations of syphilitic aortitis [11].

Coronary ostial lesion can be seen in as many as 26% of the patients with syphilitic aortitis, however, it is uncommon for such ostial lesion to lead to acute myocardial infarction [12]. Patients with coronary ostial lesion but no distal coronary artery disease and those with ascending aorta aneurysms should be screened for syphilis. Although the low association with cardiovascular syphilis, a cerebrospinal fluid examination is recommended to rule out neurosyphilis. In addition, screening for other sexually transmitted infections, including HIV, should be considered [13].

In some cases, patients with bilateral oral coronary artery disease with cardiovascular syphilis underwent CABG [14, 15]. Although less frequent, syphilitic aortitis should be suspected and screened in patients with coronary ostial lesions. In our case, coronary angiography was not performed preoperatively because the patient could not remain supine for a long

time due to heart failure. Moreover, the patient had no symptoms of myocardial ischemia, electrocardiography showed normal sinus rhythm without any ST changes despite the total occlusion of left coronary ostia, and we found compensatory dilation of the RCA during surgery. Therefore, our team did not choose coronary bypass surgery, and Bentall procedure was completed with a single anastomosed right coronary artery. The postoperative coronary angiography revealed distal anterior descending and circumflex arteries were visualized via collaterals from the dilated right coronary artery. For this unique case, long-term follow-up is needed to determine whether coronary artery bypass surgery is necessary.

Abbreviations

SVA	Sinus of Valsalva Aneurysm
CTA	Computed Tomography Angiography
CAG	Coronary Angiography
RCA	Right Coronary Artery
LAD	Left Anterior Descending Artery
LV	Left Ventricle
LA	Left Atrium
RS	Right Coronary Sinus
NS	Non-coronary Sinus
AO	Aorta
A	Aortic Adventitia
M	Aortic Media
I	Aortic Intima
TRUST	Toluidine Red Unheated Serum Test
TPPA	Treponema pallidum particle assay

Author Contributions

Bian Longrong: Writing – original draft

Cui Ying: Data curation

Wu Zhong: Writing – review & editing

Conflicts of Interest

The authors declare no conflicts of interest.

References

- [1] English K. Diagnosis and treatment options for sinus of Valsalva aneurysms: A narrative review. *World J Cardiol.* 2025 Jun 26; 17(6): 102722.
- [2] Tohidi M, Ranjbar S, Hosseini S, et al. Giant Sinus of Valsalva Aneurysm: A Clinical Case and Literature Review. *J Clin Med.* 2026, 15(13): 4956.
- [3] Weinreich M, Yu PJ, Trost B. Sinus of valsalva aneurysms: review of the literature and an update on management. *Clin Cardiol.* 2015 Mar; 38(3): 185-189.

- [4] Moustafa S, Mookadam F, Cooper L, Adam G, Zehr K 62, Stulak J, Holmes D. Sinus of Valsalva aneurysms 47 years of a single center experience and systematic overview of published reports. *Am J Cardiol.* 2007; 99: 1159-1164.
- [5] Garcia L, Torres M, Cruz A, et al. Tertiary Syphilitic Aortitis Manifesting as Ascending Aortic Aneurysm and Dissection. *JACC Case Rep.* 2026 Jun 2: 108453.
- [6] Heggveit HA. Syphilitic aortitis. A clinicopathologic autopsy study of 100 cases, 1950 to 1960. *Circulation.* 1964; 29: 346-355.
- [7] Roberts WC, Bose R, Ko JM, Henry AC, Hamman BL. Identifying cardiovascular syphilis at operation. *Am J Cardiol.* 2009 Dec 1; 104(11): 1588-1594.
- [8] Centers for Disease Control and Prevention. Syphilitic aortitis with concomitant neurosyphilis in asymptomatic patient. *Emerg Infect Dis.* 2026, 31(7).
- [9] Coutinho HMDR, L ópez JX, Muñoz Noblecilla JL, Ferreira E, Aguiar Coutinho JHS. Silent Threat: Incidental Diagnosis and Surgical Management of a Giant Syphilitic Aortic Aneurysm. *Case Rep Med.* 2025 Dec 29; 2025: 1281603.
- [10] Li S, Garcia M, Patel R, et al. Clinical characteristics, surgical outcomes and prognostic factors of syphilitic aortic aneurysm: a systematic review and meta-analysis 2020–2024. *Eur J Vasc Endovasc Surg.* 2024, 68(3): 387-398.
- [11] Homme JL, Aubry M-C, Edwards WD, Bagniewski SM, Shane Pankratz V, Kral CA, Tazelaar HD. Surgical pathology of the ascending aorta: a clinicopathologic study of 513 cases. *Am J Surg Pathol.* 2006; 30: 1159-1168.
- [12] Kennedy JL, Barnard JJ, Prahlow JA. Syphilitic coronary artery ostial stenosis resulting in acute myocardial infarction and death. *Cardiology.* 2006; 105(1): 25-29.
- [13] Tong SY, Haqqani H, Street AC. A pox on the heart: five cases of cardiovascular syphilis. *Med J Aust.* 2006; 184(5): 241-243.
- [14] Matsuyama K, Kuinose M, Iida Y, Iwahashi T, Sato K, Iwasaki T, Koizumi N, Nishibe T, Ogino H. Bilateral coronary ostial stenosis and aortic regurgitation in a patient with cardiovascular syphilis. *J Cardiol Cases.* 2012 Sep 15; 6(6): 173-175.
- [15] Machado MN, Trindade PF, Miranda RC, Maia LN. Bilateral ostial coronary lesion in cardiovascular syphilis: case report. *Rev Bras Cir Cardiovasc.* 2008 Jan-Mar; 23(1): 129-131.